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Women Entrepreneurship In Science And Technology: Impetus For Female Participation In National Development In Nigeria

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Introduction

The role of women in national development cannot be over-emphasized. Also, the place of science and technology is central to national advancement. No doubt, a country's level of Scientific and Technological advancement dictates the life style and future of her citizenry. This assertion made Wambusu (2005) to opine that science-led development is one of the major strategies in the war against what seems to be the African region's endless hunger, poverty and ill-health. In addition, increased focus on formal and informal education, new technology, empowerment of women, gender, and sustainable development will undoubtedly bring the developing world closer to the developed world and reduce the huge economic gap (Naugah 2003).

The role of Science in the advancement of human beings on issues relating to public health, water, infrastructure, energy, food, security, environment, and development is a prominent one. It stands to reason therefore that as the world's development becomes increasingly driven by and the pace also dictated by Science and Technology, no country can afford to be passive.

It therefore becomes imperative that women – a formidable group be fully integrated in the moving wheel of high technology as submitted by Bilesanmi-Awoderu (2005). The focus of the society then should involve development that would take into consideration all segments of the population, women inclusive.

Women as a person and also as an agent of development has as much right to Science and Technology as the man. In line with this, UNESCO (1995) has documented the paramount and urgent need for education for girls/women in African Countries. It is in this context that promoting women's role in Science and Technology with a view of empowering them and promoting entrepreneurial development for women scientists, engineers, and technologists becomes a big issue. The UNIDO's regional typology studies on the role of women in manufacturing have revealed empirical evidence that women's paid employment and, in particular, their participation in Industrial department, improves their quality of life, literacy and life expectancy, while decreasing their fertility rate. Remunerative employment opportunities as well as entrepreneurship also enable women to fight poverty. (UNIDO, 2001).

The Concept of Entrepreneurship

Entrepreneurship is the practice of starting new organizations, particularly new businesses. Entrepreneurship is often a difficult undertaking, as a majority of new businesses fail. Entrepreneurial activities are substantially different depending on the type of organization that is being started. (en.wikipedia.org/wiki/Entrepreneurship). Entrepreneurship can also be shortly defined as the willingness to take the risks involved in starting and managing a business. www.turnerlearning.com/efts/bball/econglos.htm. In the same vein, an excerpt from the web page: <http://bus.colorado.edu/faculty/meyer/6700syl.htm>, documents that the Entrepreneurship Center at

Miami University of Ohio defines Entrepreneurship as the process of identifying, developing, and bringing a vision to life. The vision in this context may be an innovative idea, an opportunity, or simply a better way to do something. The end result of this process is therefore the creation of a new venture, formed under conditions of risk and considerable uncertainty.

According to Di-Masi (2002), considerable effort has gone into trying to understand the psychological and sociological wellsprings of entrepreneurship. These studies noted some common characteristics among entrepreneurs with respect to need for achievement, perceived locus of control, orientation toward intuitive rather than sensate thinking, and risk-taking propensity. In addition, many have commented upon the common, but not universal, thread of childhood deprivation, minority group membership, and early adolescent economic experiences as typifying the entrepreneur.

Still on the uniqueness/qualities of entrepreneurs, Di-Mass (2002) listed the following as characteristics of the entrepreneurs:

- 1 Self-confident and multi-skilled. The person who can 'make the product, market it, and count the money, but above all they have the confidence that lets them move comfortably through uncharted water'.
- 2 Confident in the face of difficulties and discouraging circumstances.
- 3 Innovative skills. Not an "inventor" in the traditional sense but one who is able to carve out a new niche in the market place, often invisible to others.
- 4 Result-oriented. To be successful requires the drive that only comes from setting goals and targets and getting pleasure from achieving them.
- 5 A risk-taker. To succeed means taking measured risks. Often the successful entrepreneur exhibits an increment approach to risk taking, at each stage exposing him/herself to only a limited, measured amount of personal risk and moving from one stage to another as each decision is proved.
- 6 Total commitment. Hard work, energy, and single-mindedness are essential elements in the entrepreneurial profile.

Women Entrepreneurship in Science and Technology

Women entrepreneurship is a contemporary issue of international concern. This is borne out of the fact that women empowerment is central to human development and national advancement. Ensuring or enhancing women empowerment is the business of everybody in the society. Empowerment of women entails a process of building their resource capability and skills for leadership-rights and meaningful participation in all spheres of the society (Erinosho 2005). Women entrepreneurs represent a group of women who have broken away from the beaten track and are exploring new avenues of economic participation (Dhameja, 2002). He further advanced reasoning for women to run organized enterprises as their skill and knowledge, their talents and abilities in business and compelling desire of wanting to do something positive. Hence, if women are not marginalized and as much are actively involved in the mainstream of the National economy, it is likely that the economy becomes more stable and buoyant and consequently reduces much witnessed current economic problems.

The need to develop women's entrepreneurship was emphasized in Beijing (1995) at the fourth World Conference on Women. The objectives are to:

- 1 Increase the participation of women in industry and all other sectors, particularly in the non-traditional areas, through access to advanced technologies.
- 2 Promote, support, and strengthen female entrepreneurship development.
- 3 Encourage investments in environmentally safe products and in environmentally sound and productive agricultural, fisheries, commercial, and industrial activities and technologies; and
- 4 Strengthen training opportunities for women.

However, United Nations Economic Commission for Europe (2003) reported that women entrepreneurs are less numerous than men. That is, only 9% of employed women are entrepreneurs, in the Czech Republic, as compared to 8.8% of men. The situation is similar in Hungary (women 9.6% and men 18%) as well as Romania, though the proportion of self-employed women is higher due to the larger share of self-employed in agriculture (women – 17.4% and men – 32.6%). The gender gap in entrepreneurship is even higher in Slovakia and Slovenia where women's share is respectively 4.1% (men – 10.9%) and 6.5% (men – 15.3%). ([http://westorg/aboutWEST/Women Entrepreneurs in Science and Technology \(WEST\) organization, an organization for women in science and technology documents the following as its vision:](http://westorg/aboutWEST/Women%20Entrepreneurs%20in%20Science%20and%20Technology%20(WEST)%20organization,%20an%20organization%20for%20women%20in%20science%20and%20technology%20documents%20the%20following%20as%20its%20vision%3A)

- 1 Women in science and technology should become influential role models and learn to improve the worldwide problems of poverty, health, and economic growth.
- 2 Women have demonstrated their competence in science and technology but lack recognition and influence proportional to their talents and achievements.
- 3 West provides women and men an opportunity to leave a legacy by connecting others who are invested in sharing their expertise to improve the status of women to create a more egalitarian world.

The mission of Women Entrepreneurs in Science and Technology is to advance women in science and technology to achieve successful recognition as contributors and leaders through entrepreneurial thinking. This is clearly stated as:

- 1 Women who develop entrepreneurial skills are better suited to positions of leadership and impact.
- 2 Women in science and technology who develop entrepreneurial thinking will be able to better align their talents with business requirements to improve business performance.
- 3 Women can apply entrepreneurial thinking to the company environment to become intrapreneurial leaders (who increase business, profits, revenue and the creation of products).
- 4 Women who think entrepreneurially can become better scientists and engineers.

The focus of the paper centers on Women Entrepreneurship in Science and Technology: Impetus for Female Participation in national Development in Nigeria with a view of making it an impetus for female participation in national development can be said to be worthwhile. This is borne out of the fact that

females could better be encouraged right from the primary through their secondary school education so that proper monitoring, mentoring, and mainstreaming could be done with a resultant effect of more females being involved in women entrepreneurship in Science and Technology. This is our thesis.

Factors Discouraging Women Scientists' Entrepreneurship

These factors are discussed in this paper as they relate to societal norms, funding, lack of information, low skill acquisition, lack of mentors, lack of supporting networks, and low level of encouragement from spouses and families. These factors include:

- (a) Socio-cultural factor: A major point to note here is the fact that in Nigeria, many women during the socialization process were not given enough opportunity, freedom, and wherewithal to develop adequate and appropriate skills that can enable them to have entrepreneurial competency. This is essentially inherent in the much created gender-related limitations which has the tendency to relegate women/females to the background.
- (b) Finance: Poor finances and lack of adequate funds for starting enterprises are a serious problem to women entrepreneurs. Women generally are poor for lack of funds and as such do not have enough financial backing to start a good business or sustain an existing one. In this context, Carter (2000) in the web page: <http://curopa.eu.int/comm/enterprise/entrepreneurship/craft/craft-studies/documents/womenentrepreneurs.pdf> identified four areas of financing that previous researchers have noted can pose particular problems for women that are disadvantaged in their ability to raise start-up finance: guarantees required for external finance may be beyond the scope of most women's personal assets and credit track record, once a business is established, finance may be more difficult for female entrepreneurs to raise than for their male counterparts, because of the greater difficulties that women face in penetrating informal financial networks and the relationship between female entrepreneurs and bankers may suffer from sexual stereotyping and discrimination. As such, the majority of women business owners rely to a significant extent on self-generated finance during the start-up period of their business.
- (c) Lack/Poor Access to Market Information: Usually, there are not many educated women in Nigeria. The literacy level is still at the low rate in the country. As such, much of the market information that could have been beneficial and in essence enhance better productivity elude women. Most are ignorant of market trends concerning costing, pricing, etc. and consequently could not benefit maximally from readings of price movements and fluctuations.
- (d) Lack/Poor Technological Know-how: Low educational status of most women does not allow very many of them to have the opportunity of being technologically sound. Many technical skills that could hitherto have assisted to ensure successful enterprise and appropriate production techniques and product diversification are not possessed by many women. For this reason, it is almost impossible for them to be relevant in the current technological changes and the globalization of production.
- (e) Poor Networking/Linkage: Women are not properly connected. Many as noted earlier are poor, uneducated, and unconnected. As such, good networking or linkage for support services even when available may be beyond the reach of women.
- (f) Mainstreaming into Arts-related courses/paucity of Women Scientists Entrepreneurs: During

schooling, many girls were not encouraged into the sciences for reasons ranging from the perception of sciences as a male's domain, teachers' attitude, societal belief, and students' lack of interest. As such, not many of Women Scientists' could be produced. This consequently would in turn decrease the number of Women Scientists engaging in establishing business/enterprises as entrepreneurs.

(g) Fear of losing out: In Nigeria, women are largely responsible for household keeps such as food, water, clothing, and often times their children's education. As such they are usually afraid to invest their hard earned and much needed income into businesses or enterprises for fear of failure.

(h) Unfavorable conditions/policies: It is obvious that many of the conditions for obtaining loans do not necessarily favor women. The conditions are usually stricter for women than for men. This indicates gender discrimination in possession of capital for establishing enterprises/businesses. Even when policies are formulated to disabuse these gender differences, the effect in practice is yet to be noticed. This view is documented by UNIDO 2001 where it was recorded that even in Mali, women entrepreneurs are faced with strong barriers to enterprise development in the prevailing laws and regulations. It further noted that obtaining licenses, registering the business in their own name, and applying for loans were nightmares they had to live with.

(i) Lack of Mentors: It is pertinent to note that women have not gotten many mentors that they could look up to in the area of entrepreneurship. As such, they have constraints venturing into areas that they do not know familiar females that have succeeded along that line. In the words of WEST, Woman Scientists lack business issues in their industries and they also do not have easy access to mentors and role models.

(j) Lack/Low level of encouragement from spouses: Men generally enjoy being the breadwinner of the household. Most of the time they would not want their wives to be economically buoyant and independent. As such, they are not likely to encourage their wives to start businesses/enterprises that may make them economically buoyant.

Suggestions for Encouraging or Promoting Women Scientists' Entrepreneurship

In order to overcome the challenges of women scientists' entrepreneurship, the paper offers suggestions with a view to enhancing female participation in national development. These are presented based on previous reports, research findings, and suggestions of notable researchers. Specifically, UNIDO 2001 and ILO (2002) documented essential suggestions for encouraging women entrepreneurs. The investigators contend that all things being equal, the suggestions could be of great importance in the Nigerian context. Therefore, we are adopting some of the suggestions as presented:

(a) Socio-cultural Prospects: Males and females alike should be given the opportunity to acquire needed skills for entrepreneurial competency.

(b) Female Awareness Campaign and Sensitization Workshops/Seminars: There is an urgent need for awareness and sensitization workshops to be organized by women organizations, associations, government gender agencies and units, Non-governmental agencies, and allied organizations to educate the Women Scientists' entrepreneurs of the new opportunities/developments at hand that could enable them to overcome constraints and enhance the starting business/enterprise.

(c) Improvement in the Policy/legal frame-work: There is the urgent need to improve on the existing policies and legal framework in a manner that would practically reach a satisfactory level so as to encourage the female entrepreneurs. For instance, The UNIDO (2001) teams have observed that although most governments have been introducing new gender-specific laws of a general nature, gender issues were not considered in all the other laws of relevance to women's entrepreneurship development. It has also been observed that many support institutions were not aware of the gender-specific constraints of women entrepreneurs and therefore unable to address them adequately when providing the necessary services.

(d) Encouraging Female Education in Science and Technology: More females should be encouraged to study Science and Technology in schools and colleges. With this, they could gain access to know-how, technologies, appropriate and adequate skills, training to upgrade their technical capabilities, and their entrepreneurial and business skills whether in artisan production or in high-tech industries.

(e) Encouraging Women Scientists' Networking: Women Scientists have to be encouraged to be appropriately connected. Networking is vital to women's ability to access information, technology, markets, and raw materials relevant to the development, sustainability, or expansion of their business. As such, women networking nationally and internationally should be adequately facilitated.

(f) Successful Women Scientists' entrepreneurs should be encouraged to share their experiences, counsel on problems, and encouraged on prospects with up-coming women scientists.

(g) Fund/Finance: The Federal Government of Nigeria should provide adequate funds in form of soft loans for prospective Women Scientists' entrepreneurs to start up business/enterprises and or progress in their business. She can borrow a leaf from what obtains in Sweden who created a regional resources center for women finance by the Swedish Business, Development, Agency, which is a ProWomen Member. The Center's aim is to make women's competence more visible in society, to help them set up business, and in particular to increase their participation in the labor force in non-traditional, high-tech fields. [http://90i.cordis.in/article.cfm?article=1039 &lang=En](http://90i.cordis.in/article.cfm?article=1039&lang=En).

Conclusion

In this paper, an attempt has been made to highlight the need for women entrepreneurs in Science and Technology in Nigeria. It has been documented that if women are not marginalized and as such are actively involved in the mainstream of the national economy, it is likely that the economy becomes more stable and buoyant and consequently reduces much witnessed current problems. However, the factors discouraging women entrepreneurship in Nigeria are discussed. These factors include socio-cultural factors, finance, lack/poor access to market information; lack/poor technological know-how, and poor networking/linkage. Others include mainstreaming into arts related courses, fear of losing out, unfavorable conditions, lack of mentors, and lack/low level of encouragement from spouses.

Against this backdrop, this paper offers some suggestions for encouraging and promoting Women Scientists' entrepreneurship. These include socio-cultural prospects, female awareness campaign and sensitization workshops, improvement in the policy/legal framework, encouraging female education in Science and Technology, and provision of adequate funds. In addition, networking should be encouraged where in successful Women Scientists' entrepreneurs could share their experiences, counsel on problems, and encourage on prospects.

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