

# SCIENTIFIC LITERACY FOR WOMEN: A FOUNDATION FOR BUILDING A HEALTHY NATION

*Nkweke, Chimezie N. (Miss)*

## Abstract

A healthy nation is a wealthy nation<sup>1</sup>. Scientific literacy (SL) promotes better health for the individual particularly the woman, who is the cornerstone of the family unit and the society at large. Radiant health can be achieved by eating nourishing food and maintaining sound mental altitude and behaviour, quality sanitary conditions with respect to food preparation, pregnancy, infant child care, well as environmental protection and disease prevention/control. Sustainable food production which is achieved mostly by women hinges on SL (and Technology) and promotes economic empowerment and poverty alleviation through agro-allied cottage industries. A healthy mother gives birth to healthy children who will equally contribute meaningfully to the growth of the nation. Population control is a critical factor in any nation building and a scientifically literate woman is well equipped to achieve it. A more effective strategy should be to focus on general illiteracy and particularly low participation induced by religious and socio-cultural practices which promote the syndrome known as 'gender inequality' (GI). GI gives rise to a number of factors which result in the collapse of the framework upon which a nation is built.

## Introduction

'Health Is Wealth', an adage says. A nation with citizens who are well fed, mentally sound and disease free is a healthy and indeed a wealthy nation. The major 'developmental pathogen' (DP, coined by the author) that attacks and shakes the foundation of any developmental process is illiteracy. It produces inequality a syndrome manifested by unemployment, poverty, malnutrition, illness and high mortality rate among children and women. Bashin (1984) in Idakwo (1996: 129) however refers to illiteracy as the symptom of the disease, inequality. The inter-relationship between the DP syndrome and symptoms of a collapsed/collapsing developmental foundation is schematically shown in figure 1 below: /

## Syndrome

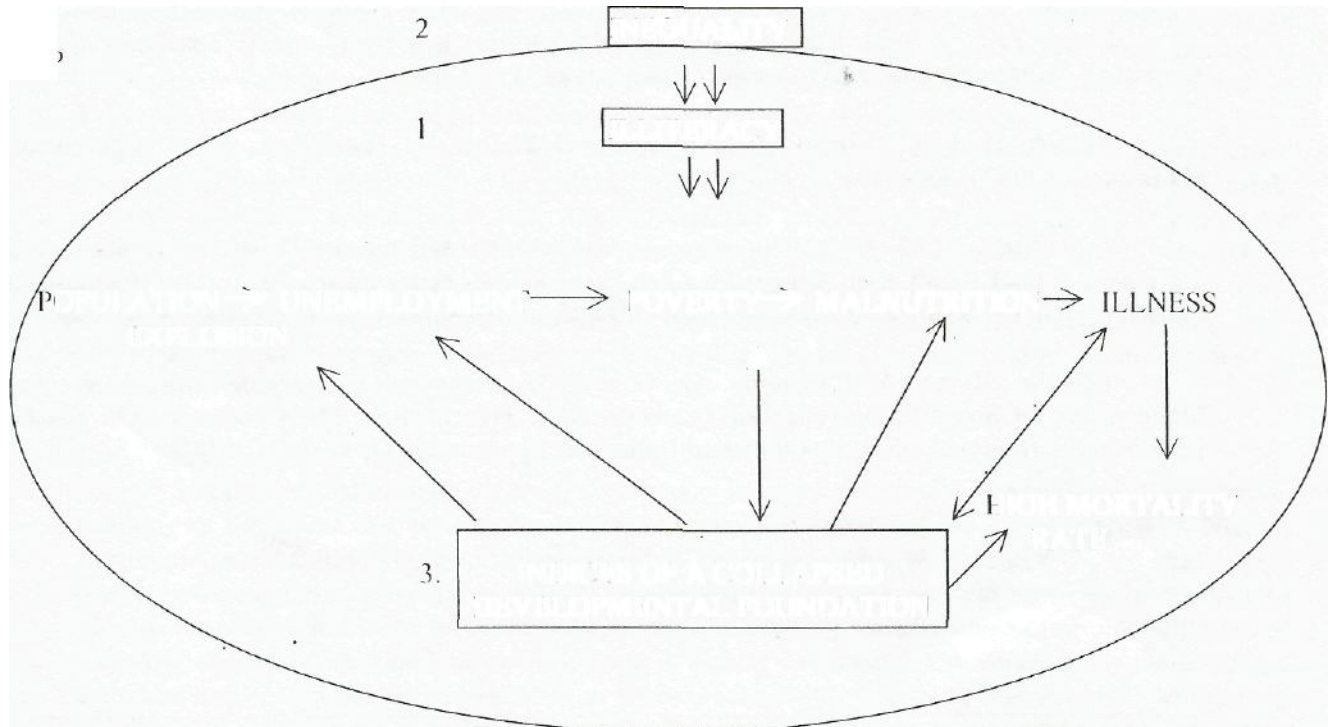


Figure 1. A Scheme Showing I low Illiteracy Interacts With Inequality To Bring About The Collapse Of The Foundation Of A Nation's Developmental Effort . (Author's design)

Humanly speaking, controlling the DP should undoubtedly reduce to a barest minimum the syndrome and associated problems, but would require the 'Balm of Gilead' to effect wholcomeness and restore radiant health. The most effect strategy therefore is through education for the greater number of the people, particularly girls and women. Education, particularly Scientific and Technological literacy is the antibody' that would provide immunity against these problems. It is a liberating force and serves human welfare far belter than false beliefs and prejudice, producing such positive values as ability to think creatively, test facts for its truth or falsity, ability to solve individual and societal problems and promotion of sound mental, and social wellbeing. It is in recognition of theabove that the Federal Government adopted the use of education as the foundation for "building a united, strong and self-reliant nation; as well as inculcating emotional, physical and psychological health of all individuals" (NPE, 1981:7). The level of any nation depends on the level of its scientific and technological literacy. This is particularly important with respect to women because of the central role they play in maintaining and sustaining family health and food production for the society at large. Therefore, any nation that neglects their education can be compared to a man who builds his house on sand and when the winds and the rain comes, there it goes crashing because of collapsed foundation.

This paper therefore focuses on how SL for women especially can be instrumental to:

1. building of a nation's food reserve;
2. promoting and maintaining/sustaining radiant health for themselves and those of family members;
3. building/maintaining a safe environment; and
4. promoting cottage industries as economic empowerment.

It also highlights participation patterns in science disciplines and offer suggestions on promotion of functional SL for girls and women.

(a) **Definition Of Concepts**

- (i) **Science:** This is a human pursuit which enlightens man about his bio-physical world (BPW) (Gaylord, 1980:3) through process-based learning skills such as performing experiment suggesting tentative solutions to problems (hypothesis), collecting and analyzing data critically, building theory to establish the truth (Bowyer, 1990:9). The BPW comprises the air, water, soil, space, plants, animals, micro-organisms as well as energy resources.
- (ii) **Scientific Literacy (SL):** This is the type of education/literacy that equips the mind of an individual in the understanding of the structure, and
- (iii) **Healthy Nation:** According to WHO/UNFAO/UNICEF (1989) in Jbeagha, (2000:53). health is 'a state of compete physical, mental and social wellbeing and not merely the absence of disease or infirmity and in all matters relating to the reproductive system and to its functions and processes'. In this wise, a healthy nation can be said to be one whose socio-economic wellbeing is in a state of equilibrium. The state of wellbeing of a nation is therefore an index of its health status.

(B) **Nature Of Science And Scientific Literacy**

- » Science is a method of inquiry. H helps our sense of curiosity, creativity and the need for expressing ourselves in the laboratory and space.
- » Sciences as a discipline is resolved into three fields-biological, chemical and physical sciences which are inter-related and inter-dependent.
- » Science is related to technology; Engineers employ scientific principles and processes to design and manufacture equipment. Moreover, the use of technological equipment helps to advance Si-while more expositions in science also promote technological advancement. For example, microscopes have helped us to identify and characterize the genetic materials of living organisms.

and these have equally helped the genetic engineers to manipulate the materials in order U> produce drugs, hormones such as insulin, which is used for treating diabetic patients.

- \* Science is related to the society through technology. This is the basis for the 'Science,

Technology and Society' (STS) approach in science pedagogy (NCCE, 1991). This simply involves applying S & T to every day life situations.

- \* Science is also related to economy; Environmental science (ecological education) focuses on ensuring that the individuals utilise the natural resources in the environment in such a way to avoid/minimize depletion and hence conserve them for the purpose of sustainable development.
- \* Scientific curriculum and methodology is based on the pragmatic philosophy of experimentation, problem solving approach and flexibility to enable a change(es) to be made when the need arises. (Omon and Cramer, 1976:97-8).

### **3 Scientific Literacy And Nation Building**

The contributions of SL in relation to the building of a healthy nation would be highlighted under the following headings: (i) Agriculture and food (ii) Better health (iii) Safe environment (iv) Technology/Industry. These, as well as Design, Communication and Ethics should constitute the curriculum for basic scientific and technological literacy (Bowyer, 1990:8) in order to meet the needs of the individuals and the society at large.

#### **(i) SL In Building Of A Nation's Food Reserve**

SL provides women, major food producers of the country, (Bowyer, 1990:27), with knowledge, principles and process skills required for improved cultural practices, alternative systems of land management, pest/disease as well as erosion control; food processing, preservation and storage techniques; animal health care inter alia. All these would ensure sustainable food availability for the family and the market.

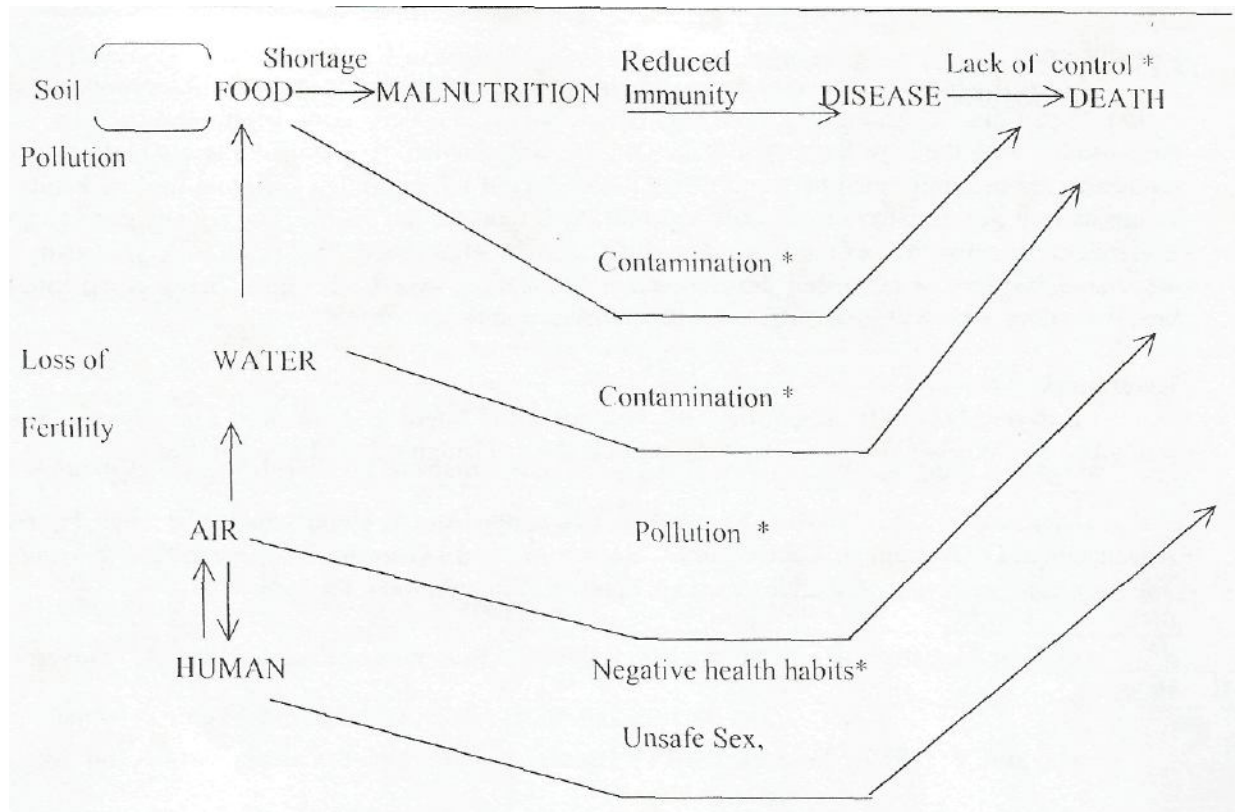
#### **(ii) SL In Achieving Better Health For All**

Continued food availability made possible by SL ensures absence of dietary deficiency disease and this translates to better/radiant health, all things being equal. Malnutrition has been singled out as the most extensive and serious health problems affecting infants of the world particularly in developing countries. (Ibeagha, 2000:53) Literacy in child and maternal nutrition, reproductive health, disease prevention and control as well as general hygienic practices would contribute immensely in reducing infant mortality as well as maternal death caused by unsafe abortion from unwanted pregnancy. (Idakwo, 1996: 127; Managuyu. 1996: 14). SL also fosters correct habits that emphasize the working together of the mind and body to achieve a long healthy and happy life. A healthy mother produces healthy children and hence a healthy nation.

#### **(iii) SL In Promoting Safe Environment/Resource Control**

Environmental science (Ecological Education) is closely associated with health. Literacy in this sphere enables women to protect the environment and hence reduce the occurrence of pollution and its resultant effects on humans, animals and the entire ecosystem. Besides, the need to conserve resources for sustainable availability are enforced even in the minds of children by their mothers. Literacy in disease transmission through air, water and food as well as by contact informs the women to maintain stringent sanitary measures in order to prevent the outbreak of infections from these resources.

The interaction between food, water, air and human environment in disease production and death, a negation to nation building, is shown in the scheme below:



\* Problem induced by Scientific Illiteracy

Figure 2A Scheme Showing How Scientific Illiteracy Can Lead To High Mortality Rate.

#### (iv) **SL In Building Of Nation's Industries**

Scientific principles are utilized by women to transform agricultural produce into other useful products. This is indeed technology. This means that SL promotes the development of women in technology, be it indigenous or adaptive. More over, this promotes the building of agro-allied industries, an economic empowerment development which is a factor in alleviating poverty among women. Some of the cottage industries are those involved in soap and pomade making from oil; yoghurt and cheese making from milk; oil extraction from palm fruit, soy beans, melon, groundnut to mention but a few. A woman who is thus empowered is well able to provide for the basic needs of her family members. The 'Better Life For Rural Women' of 1991 though.

#### 4. **Participation In Scientific Literacy**

Scientific Literacy should be experienced and recognized as a product of human activity and thinking process. This is the "principle involved in the process-based learning of science disciplines. Participation patterns in science and non-science subject areas have been documented. The general trend is that the majority of the people both in Nigeria and elsewhere for obvious reasons prefer non-science disciplines in our schools and colleges. This is also depicted in the enrolment pattern shown in Appendix. For instance, the ratio of the number of students (male and female) that enrolled in Business Education to Science/pure science based vocational education are 206:95 and 162:74 in the year 1999/2000 and 2000/2001 respectively. Universally, female participation in Science (and Technology) is lower when compared with male participation (Nkweke, 2001:113; Onwiodukit, 1996:202; Bowycr, 1990:28). This trend is best seen in Appendix 2. Various reasons have been given for the low participation and achievement as well. Permit me here to cite, an instance of a female computer operator who openly declared her HATRED for the sciences; What an irony! Low participation in literacy in general and particularly in SL has been linked to gender inequality induced by religious, and socio-cultural factors. Gender inequality has been particularly associated with HIV/AIDS scourge with resultant high mortality rate across the globe (Nkweke, 2000:14; Awake Magazine, February 2000: 14). This should be a major concern with respect to nation building.

#### **Conclusion**

Scientific literacy for women in particular should be given top priority if we want a healthy nation. According to Mangulu (1990:12), Africa still has a very poor health status. This is not unconnected with the high level of illiteracy of girls and women. A scientific literate mother ensures the health of her family members

and hence the society at large through fostering healthy habits and values as well as provision of adequate and nutritious food for the people. She equally ensures a safe Investment therefore in women SL, a critical step in eliminating the syndrome, inequality and associated markers of collapsed developmental foundation would, all things being equal, produce healthy women who will give birth to healthy citizens and hence a healthy nation.

#### References

Bowyer, .1. (1990): Scientific And Technological Literacy. Education For Change. Special Study For The World Conference On Education For All. Thailand, 5-9 March. UNESCO.

Dickson. A. A. (1996): Vocational Education As A Contribution To The Economic Advancement Of Women In Contemporary Nigeria In: (Ed.) Oruwari, Y: Women Development And The Nigerian Environment. Tbadan: Vantage Publishers International Limited.

Federal Ministry Of Education (1981) National Policy On Education. Lagos: Government Press.

Gaylord, C. (1980): The New Book Of Popular Science, Vol. 6. Canada. Grolier Intl. Inc.

Ibeagha, C. .1. (2000): Breastfeeding: Imperative For Healthy Infant Growth And Development. Natural And Applied Science Journal. Vol. 33. Enugu: Syco Publishers.

Idakwo, D. O. (1996): Education For Women: Its Implication For The Development Of Nigeria, In: Gender Issues In Education And Development A Book Of Readings (Ed. Okpara. E. N.) APQEN. Vol. 8. Nsukka: University Trust Publishers.

Mangulu, F. W. (1996): Human Values And Sustainable Development; The Changing Face Of Africa. International Lecture Series On Population Issues. (February), Lagos.

NCCE, (1991): Nigerian Integrated Science Teacher Education Project- Kaduna: National Commission For Colleges Of Education.

Nkweke, C. N. (2001a): Science And Scientist: Case Study Of FCE Technical). STAN 42"" Annual Conference Proceedings (Ed. Busari, O. O) H. E. B. (Nig) PLC.

(2001b): Gender Inequality And HIV/AIDS Scourge. Seminar Paper Presented At FCE (T) Omoku (TTC Education Programme, Unpublished).

Onwiodukit, F. A, (1996): Gender Differences Among Undergraduate Students Enrolment And Academic Performance In Science. In: APOEN. Vol. 8.

Oxmon, IL And Craver, S. (1976): Philosophical Foundations Of Education. Ohio: Bell And Howell Company.

**Appendix 1: Comparative Enrolment Of Students In Science And Non-Science In FCE(T), Onioku From 1999/2000-2000/2001**

School/Department	1999/2000			2000/2001		
	Male	Female	Total	Male	Female	Total
Agric Science	36	20	56	10	37	47
Chemistry/Computer	4	8	12	4	3	7
Integrated Science	4	17	21	5	14	19
Physics/Computer	5	1	6	4	3	7
Business Education	62	144	206	52	110	162
Fine Art	9	21	30	20	25	45
Home Economics	-	48	48	-	30	30

Source: Academic Office, FCE(T) Omoku.

**Appendix II: Enrolment Of Students In Science Subject In May/June 2000 WASSCE**

Subject	Enrolment (E)			
	MFE	ME	FE	FEJ} 'o
AGRIC SCIENCE	506,756	289,964	216,792	42.78
BIOLOGY	641,541	342,760	298,781	46.57
CHEMISTRY	202,899	124,048	78,851	38.86
PHYSICS	195,226	122,489	72,737	37.26

Adapted from STAN, National Officers' Reports (2001, P. 16).