

Biology Education and Poverty Alleviation in Nigeria: Issues and Challenges

Oboh Felicia O. (Mrs)

Poverty is a social and economic problem. To tackle the menace of poverty and reduce its effects on our nation, there is need for effective functional Biology education. The paper discusses the concept and effects of poverty such as malnutrition, crimes and violence. The paper also discusses current issues with respect to poverty alleviation in Nigeria and strategies for alleviating it. Furthermore, challenges such as inadequate and poor teacher preparation, inadequate funding are enumerated. It is therefore recommended among others that adequate allocation and proper preparation of teachers should be ensured for effective delivery of Biology education which will prepare and equip individuals in participating in the socio – economic and political life in their communities thereby alleviating poverty among them.

Introduction

Worldwide, education is considered as an important tool for attaining national goals. Education provides learners with skills needed for survival. It is as a result of the importance of education, the Federal Government of Nigeria introduced the Universal Basic Education whereby education is free and compulsory for all citizenry at least to the secondary level of education (Mgbomo, 2013).

Biology education plays an important role in the development of any nation. All the areas of science and technology curriculum (Biology inclusive) have been restructured towards the 2030 agenda which was adopted by the United Nations in 2015 for sustainable development. The Sustainable Development Goals (SDGs) includes eradicating extreme poverty and hunger. This means to:-

- end poverty in all its forms everywhere; extreme poverty has been cut by more than half since 1990, however more than 1 in 5 people live on less than \$1.25 a day;
- achieve full and productive employment and decent work for all, including women and young people; and
- end hunger, achieve food security and improved nutrition.

One of the most disturbing features of the world, particularly the Third World to which Nigeria belongs to, is poverty. It remains one of the most familiar enemies of most Third World countries. Poverty is a pandemonium that has eaten

so deep into the fabric of the Nigerian populace. It is one of the very many problems of serious magnitude confronting Nigeria today.

Nigeria as a nation has pledged that all efforts are to be made for the realization of the SDGs by 2030. Despite the promises and efforts, results have not been as expected. A speech by the World Bank Group Senior Vice President, Mahmoud Mohieldin, in 2016 highlighted that the challenges we face in achieving the SDGs are immense, but the Sustainable Development Goals provide a clear global mandate to address poverty. He further highlighted that the obstacles we face is attributed to lack of finance, management problems, and the use of wrong approaches. This paper therefore, examines the concept of poverty, its causes, effects and eradication through Biology education.

Concept Of Poverty

According to Imaekhai (2009), poverty as a concept is difficult to define and scholars have defined it in relative terms. The Encarta Dictionary (2010) defines poverty as a state of being poor. That is, a state of not having enough money to take care of basic needs such as food, clothing and housing. Also, poverty is a deficiency or lack of something.

In the Encyclopaedia of theology, (Verhey, 1995) also states that, *Poverty is a lack of means of subsistence (food, clothing, shelter and so on)*. But besides deprivations of this kind, poverty also connotes helplessness, when faced with the demands of life: ignorance, weakness, bondage, isolation, defencelessness against injustice. In relation to this definition, Corbett (2007) defines poverty as a “condition of having insufficient resources or income. In its most extreme form, poverty is a lack of basic human needs, such as adequate and nutritious food, clothing, housing, clean water and health services. In the concept of United Nations Sustainable Development Goals (SDGs) an extreme poor person is a person who lives on below \$ 1.25USD daily.

Akpomuvie (2011) posits that people are poverty stricken when their incomes, even if adequate for survival fall radically behind that of the community... they are degraded for in the literal sense, they live outside the grades or categories which the community regards as acceptable.

Stacy (2008) note that poverty is a relative concept and to really measure poverty, one has to look beyond a person’s financial income. It is for this reason that Stacy (2008) citing Haveman (2003) argues that a better way to measure poverty is *someone’s access to: quality education, health care, adequate housing in safe neighbourhoods, information on available public benefits, social contacts*.

Poverty according to Wikipedia (2010) is the condition of lacking basic human needs such as nutrition, clean water, health care, clothing and shelter because of the inability to afford them.

Sen (2000) define poverty as the lack of certain capabilities, such as being able to participate with dignity in society. Nweke (2012) points out that poverty is usually conceived in absolute or relative terms; but more importantly, it is essentially an existential issue that touches on the conditions of life that a section of poverty experiences, as they meet the challenges of life. Nweke (2012) associates low level of life expectancy, education, political participation and access to health care increase in infant mortality with extreme poverty. He further described extreme poverty as a destitute condition in which people lack the opportunities to develop capabilities required to live a basic human life, thereby causing exclusion from society and development process. He finally posited that a poor person is that person who cannot access basic human needs required for survival and who is voiceless and powerless resulting from inability to participate or excluded from public decisions that could improve his standard of living.

In an effort to fight the menaces inherent in the concept of poverty and hunger, the United Nations held a summit for the adoption of the post-2015 development agenda. It was held from 25 to 27 September 2015, in New York and convened as a high-level plenary meeting of the General Assembly. A bold new global agenda to end poverty by 2030 and pursue a sustainable future was unanimously adopted by the 193 Member States of the United Nations at the start of a three-day Summit on Sustainable Development. This historic adoption of the new Sustainable Development Agenda has *17 core goals known as the Sustainable Development Goals*.

Causes Of Poverty

According to Oriahi and Aitufe(2010), poverty has many causes, some of them and very basic. Some experts suggest, for instance, that the world has too many people, too few jobs, and not enough food. But such basic causes are quite intractable and not easily eradicated. In most cases, the causes and effects of poverty interact, so that what makes people poor also creates conditions that keep them poor. Primary factors that may lead to poverty include:

- **Overpopulation:** this is a situation of having large numbers of people with too few resources and too little space. Excessively high population densities put stress on available resources. Consequently, in the rural areas, overpopulation could lead to scarcity of land which invariably will lead to shortage of food supply.

However, Corbett (2007) opines that in developed countries such as the United States and the countries of Western Europe, overpopulation generally is not considered a major cause of poverty. These countries produce large quantities of food through mechanized farming, which depends on commercial fertilizers, largescale irrigation, and agricultural machinery. This form of production provides enough food to support the high densities of people in metropolitan areas. It is important to note that high birth rate leads to overpopulation.

- **Unequal global distribution of resources in the world economy which was caused by the legacy of colonialism.** Many developing countries, however, lack essential raw materials and the knowledge and skills gained through formal education and training. They also often lack the infrastructure facilities like transportation systems and power generating facilities which are needed in industries.

- **Poor health and diseases cause poverty in Nigeria.** This is supported by Imaekhai (2009) as he posits that “poor health shackles human capital, reduces returns to learning, impedes entrepreneurial activities and holds back growth and economic development.” Diseases, for example AIDS, which affect more of the adult population will certainly constrain the availability and participation of this segment of the population to earn income, which leads to poverty.

- **Inadequate employment and education:** Illiteracy and unemployment are common in developing countries. In Nigeria, for instance, most public schools are not well funded by the government. It is a known fact that without education, most people cannot find income-generating work. Poor people also often forego schooling in order to concentrate on making a minimal living. In addition, developing countries tend to have few employment opportunities. Unemployment rates are high which leads to high level of poverty. Corbett (2007) notes that in countries with high populations, unemployment levels of only a few percentage points mean that millions of working-age people cannot find work and earn an adequate income and that other people may earn wages too low to support themselves.

- **Environmental degradation:** In many parts of the world, environmental degradation, which is the deterioration of the natural environment, including the atmosphere, bodies of water, soil, and forests, is an important cause of poverty. Environmental problems have led to shortages of food, clean water, materials for shelter, and other essential resources.

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Effects Of Poverty

- **Poverty could lead to homelessness:** This result in a large population of the country being homeless or inadequate housing. Wright (2007) notes that even larger numbers are considered ‘marginally housed’ because they are in danger of becoming homeless because of poverty or inadequate housing. For him, those who are housed only because they have been able to stay with family or friends are known as the ‘hidden homeless’.
- **Poverty results in malnutrition and starvation:** Malnutrition is a dietary condition caused by a deficiency or excess of one or more essential nutrients in the diet while starvation is a condition in which the body’s tissues and organs deteriorate. Long-term starvation almost always results in death (Corbett, 2007). When there is poverty people hardly have the income to buy and eat food rich in protein, vitamins, vegetable, fruits etc. they mostly eat food that are fatty or fried, high in sugar and salt, and made of mostly processed carbohydrates. This results in obesity and hypertension, both of which results in heart diseases and other ailments (Corbett, 2007).
- **The poor experience high rates of infectious disease:** Inadequate shelter or housing creates conditions that promote disease. Inadequate sanitation and unhygienic practices among the poor also lead to illness. For instance, in ghettos and shantytowns that house only poor people, overcrowding can lead to high transmission rates of airborne diseases, such as tuberculosis, chicken-pox, and so on. According to Corbett (2007), the poor are also often uneducated about the spread of diseases, notably Sexually Transmitted Infections (STIs). As a result, STI rates are high among the poor. He also notes that along with the problem of a high incidence of disease, developing countries also have shortages of doctors.

Medicine and treatment are often both scarce and too expensive for the poor.

- **Poverty leads people to commit acts of crime and violence such as antisocial behaviour:** Anti social behaviour ranging from child trafficking, prostitution, political assassination, election thuggery and rigging. Anger, desperation, and the need for money for food, shelter, and other necessities may all contribute to criminal behaviour among the poor. Poverty undoubtedly motivates people to commit crimes, although it may not be the only factor involved.
- **Poverty reduces human want and personal dignity:** The rights and privileges of the poor are not respected. The process of self-actualization and selffulfilment are hampered, if not completely jeopardized, as the poor live below subsistence level (Imaekhai, 2009).

Current Issues With Respect To Alleviating Poverty In Nigeria

In sub-Saharan African, the World Bank (2008) reports that extreme poverty went up from 41% in 1981 to 46% in 2001, which combined with growing population increased the number of people living in poverty from 231 million to 318 million. Earlier on in 2007, the Central Bank Governor made a startling revelation on the level of poverty in Nigeria. His reports on incidence of poverty and poverty disparity in the country are presented in Tables 1 and 2 respectively. Table I: Incidence of Poverty in the six geopolitical zones of Nigeria

S/N	Zone	Actual Incidence of Poverty (%)
1.	South-South	35.06
2.	South-East	26.74
3.	South-West	43.01
4.	North-Central	66.97
5.	North-West	71.17
6.	North-East	72.16

Source:

Table II: Poverty disparity in Northern and Southern States

S/N	State	Incidence of Poverty (%)
1.	Jigawa	95.0
2.	Kebbi	89.7
3.	Kogi	88.6
4.	Bauchi	86.3
5.	Yobe	83.3
6.	Zamfara	80.0
7.	Enugu	31.1
8.	Anambra	20.1
9.	Bayelsa	20.0

Source: Cbn Governor's Report 2007

With the increase in the level of insecurity in Nigeria and its attendant consequences, it is most likely that the situation may have grown worse especially in the north. Poverty goes beyond lack of income and productive resources for livelihoods. Some of the indicators of poverty include lack of basic social amenities and services, hunger and malnutrition, limited access to quality education and improved medical care and lack of participation in decision making.

Kirk Liegh (2007) in Nweke (2012) reports that, Nigeria is now considered one of the 20 poorest countries in the world. The SDGs Report (2016) notes that The proportion of the global population living below the extreme poverty line dropped by half between 2002 and 2012, from 26 to 13 per cent. This translated to one in eight people worldwide living in extreme poverty in 2012. Meanwhile, poverty remains widespread in sub-Saharan Africa, where more than 40 per cent of people lived on less than 1.90 US dollars a day in 2012. Ojo (2013) studied the journey so far in alleviating poverty and posited that the poverty level in Nigeria is on the increase.

This goal is aimed at lifting people out of extreme poverty by providing them with the basic things they need to live a decent life: nutritious food, cloths, clean water, a home and health care. This is a dream yet to come true as the findings of the FRN report (2005) reveals that a total of 34.9% of the populace was found to live in absolute/extreme poverty. 51.9% of the population was found to live below international poverty line \$1 USD per day; this is relatively high in the rural areas where over 70% of the unemployed are unskilled people between the ages of 21-18 years.

Strategies For Alleviating Poverty Through Biology Education

Education is the key to national development. Functional Biology education in particular prepares and equips individuals to participate in the socio-economic and political life of the community. Appropriate education is key to ensuring that Biology provides the knowledge base to support entrepreneurship; it is further necessary to link Biology to entrepreneurship skills so that there will be tangible outcomes which will improve the livelihood of the poor (Mijung and Diong 2012.) It addresses the needs of majority through its relevance and functionality in content, practice and application. Nwagbo (2009), opined that functional education especially biology, will drive away illiteracy, create jobs, produce food for the people, provide services and lead to democracy.

- **Teaching Biology with the right attitude and spirit of discovery/inquiry.**
The ways students learn are as important as what they are learning. The selection and proper usage of the appropriate and most effective method is

very crucial to the success of a lesson, because teaching methods determine whether a teacher is communicating with his students or not. Moreover, for a biology graduate to be productive and functional in a changing society, he/she must acquire the right attitudes, habits and saleable skills. These attitudes, habits and skills can be developed by our students, if biology education is taught with the right spirit of inquiry and discovery oriented teaching methods.

- **Relating Biology Concepts To Human And Societal Needs**

Balogun (1982) identifies six basic needs of man as food, drinking water, basic health, shelter, energy and education. Omiko (2005) observed that good and functional Biology education is needed for better and effective food production and food safety, quality medication, welfare provision and portable water supply. Application of biology in farming, fishing and daily life activities will enable the students to see the relationship between Biology and human needs. This will facilitate an understanding of these principles and concepts thereby enabling them to utilize the knowledge to the outside world.

- **Using career-oriented strategy in teaching Biology in Nigerian schools**

Career-oriented teaching strategy should be inculcated in our biology curriculum. This teaching approach gives concrete examples with what is happening in the real life situation in the world of work. In career-oriented teaching approach, what is taught in the school is linked up with job opportunities in the world of work. What the teacher does is to link up the concepts taught with related careers in the job market. For instance, in connection with a life Biology unit, a teacher might want to teach heredity to his students. In the course of his teaching, he might ask students to look personal traits such as tongue rolling, hitchhikers, thumb or earlobe attachment and he tells them that these traits are inherited. The teacher can also tell the students about job/career opportunities available for each course studied in the universities.

Career-oriented teaching approach is also activity oriented. Ezeifedi (1973) observes that activity method of teaching Biology stimulates the interest of students in learning and enhances better understanding and better achievement. Obianyo (2001) carried out a research on the influence of Career-oriented teaching Approach on student's achievement in Biology. The result revealed that students taught using Career-oriented teaching approach performed significantly better in understanding the concept taught

and in the choice of Biology related careers than those students taught using the conventional lecture methods. According to her, the significant difference was due to the fact that career-oriented teaching approach gives concrete examples with what is happening in the real life situation in the world of work.

- **Employment Of More Qualified And Dedicated Biology Teachers**

Our schools need more qualified and dedicated Biology teachers, who teach not only biological facts and techniques, but inculcate the right spirit of Biology and attitude of inquiry in the minds of the students should be employed.

Challenges Of Poverty Alleviation Through Biology Education The Challenges of Biology education in Nigeria are enumerated below:

- Inadequate and poor Biology teacher preparation: According to Nwagbo (2005), only a few teachers are available for teaching biology and even so, many of the few are ill-prepared to handle teaching. On this, Nwagbo (2005) writes, “Science teachers lack the basic knowledge and skills needed for appropriate science teaching, especially at the primary school level which is the foundation of education”.
- Inadequate funding: Adequate funds are needed for teacher preparation and making available to schools, other resources for teaching and learning. • Poor allocation of resources to Biology education: Resource allocation involves the provision of teachers, payment of their salaries and provision of teachers fund for laboratory, equipment, books and allocation of instructional hours to various subject (Okeke, 2005).
- Lack of adequate materials to motivate students to learn Biology and acquire basic knowledge and appropriate skills, and thus leading to alleviation of poverty.

Conclusion

Biology education as a science subject is one of the *vehicles* for national development. Scientific literacy is indispensable in achieving industrial and technological development of any country and has long term negative effect on society such as poverty if it is not achieved. Poverty alleviation would easily be realized if the citizens are scientifically literate and possess the right attitude,

habits, and saleable skills which are capable of making individuals self-reliant and relevant in the society.

Recommendations

To reverse this ugly trend of poverty in Nigeria, the following suggestions are made:

- Stakeholders in the educational sector should ensure adequate allocation and proper preparation of teachers.
For teachers to handle Biology teaching, they should not only be adequate in number, but also sound in preparation. Therefore, teachers should receive adequate training in educational pedagogy, content and assessment orientation.
- Administrators and Supervisors in the Educational Sector should ensure proper Biology curriculum Delivery.
Biology educational curriculum can only be properly delivered if strictly professionally trained Biology teachers are made to handle Biology.
- The government should ensure that the citizens, especially the poor people have access to basic education.
- Government should employ qualified biology laboratory attendants to manage and maintain laboratory.
- Teachers should invite resource persons/co-teachers to help deliver topics/concepts that they perceives difficult.
- Government should organise workshops regularly on the use of innovative teaching methods for teaching biology.
- School supervision should be taken more seriously.
- Biology concepts should be taught with practical activity to develop students' scientific skills.

References

- Akpomuvie, O. B (2011). Millennium Development Goals and the Poverty question in Nigeria. *Mediterranean Journal of Social Sciences* 2 (2), May, 2011.
- Balogun, T. A. (1982). Improvisation of Science Teaching Equipment. *Journal of the Science teachers Association of Nigeria*, 20 (2), 131 –137.
- Corbett, T. J. (2007). Poverty. In: Encarta Encyclopaedia. Microsoft® Student 2008 (DVD) Microsoft Corporation, Redmond, WA.
- Central Bank of Nigeria (2007). Annual Governor's Report On the "Incidence of Poverty in the Six Geopolitical Zones" and "Poverty Disparity in Northern and Southern States" CBN Annual Report 2007

Encarta Dictionary ©2010, By Wiley Publishing, Inc., Cleveland Ohio

Retrieved On 21/2/2017 from *www.encarta.com/poverty*

Ezeifedi, O. E (1973). A Comparative Study of the use of the Project Method and Lecture Method in History Teaching. Unpublished B. A Education Thesis, University of Nigeria, Nsukka.

Federal republic of Nigeria (2005). Millennium Development Goals. August 2005 report, Abuja, National Planning Commission.

Haveman.R. H, (2003). Understanding Poverty, *Journal of Sociology and Social Welfare*, VOL.30 Article 20, (1-4)

Imaekhai, F. J. (2009). Effect of poverty in Nigeria. A seminar paper presented in the Department of Religious Management and Cultural Studies, Ambrose Alli University, Ekpoma, Edo State, Nigeria.

SDGs (2016). United Nation Sustainable Development Goals Report 2016 p (5)

Mahmoud, M. (2016). "Unlocking Means of Implementation for the SDGS and Creating an Enabling Environment" Speech by World Bank Group Senior Vice President on July 18 2016 retrieved on 21/02/2017 from <http://www.worldbank.org/en/news/speech/2016/07/18>

Mgbomo, T. (2013). Empowerment of Science Technology and Mathematics (STM) Teachers: A Strategy for the Realisation of Millennium Development Goals. *STAN 54th Annual conference proceedings* (69-73).

Mijung, K. and Diong, C. H. (2012). Biology Education for Social and Sustainable Development Published by: Sense Publishers, © 2012 P.O. Box 21858, 3001 AW Rotterdam, The Netherlands
<https://www.sensepublishers.com/>

Nwagbo, C. R. (2009). Enriching Senior Secondary School Biology Curriculum through Integrating Entrepreneurship Activities. *STAN, 5 Qts Annual Proceedings* (128 – 132)

Nweke, E. N. (2012). Increase of Extreme Poverty and Hunger in the content of Millennium, Developing Country Studies, vol 2, No. 5 2012. Retrived on 21/02/2017 from *www.iiste.org*

Obianyo, B. N (2001). The Influence of Career-oriented teaching Approach on

Students Achievement in Biology. Unpublished M. Ed dissertation, University of Nigeria, Nsukka.

Ojo, E. E (2013). Millennium Development Goals (MDGs): The Journey so far in eradicating Extreme Poverty. Attaining the MDGs through STEM Education.

Science Teachers Association of Nigeria (STAN) 54th Annual Conference 20 (145-154)

Okeke, E. A. C (2005). Funding of Education in Nigeria: Realities and Strategies for Improvement. An Invited Seminar Paper, Faculty of Education, Nnamdi Azikiwe University, Awka, Annual Lecture, 28th June 2005

Omiko, A. (2005). Reforming Science and Technology Curriculum to meet challenges of the emerging World order: *Science Teachers Association of Nigeria. 52nd Annual Conference proceedings*. Pp 30-36

Oriahi, C. I & Aitufe, A. O. (2010). Education for the Eradication of Poverty. *Current Research Journal of Social Sciences* 2(6): 306-310.

Stacy, V. (2008). What is Poverty? The Janeville Gazette. Retrieved from: www.gazettextra.com/education/what-poverty, (Access on: August 28, 2009).

Sen, A. (2000). Social Exclusion: Concept, Application and Scrutiny, Social Development Papers No. 1, Office of Environment and Social Development, Asian Development Bank, June 2000 (1-60)

The World Bank (2015). World Development Poverty Ratings and Progress

towards National Education Reforms. *Science Teachers Association of Nigeria (STAN). 52nd Annual Conference proceedings* (48-53)

United Nations Sustainable Development Summit 2015; 25 - 27 September 2015, New York. The United Nations summit for the adoption of the post-2015 development agenda retrieved on 21/2/2017 from <https://sustainabledevelopment.un.org/post2015/summit>

Verhey, S.(1975). Encyclopedia of Theology: A Concise Sacramentum Mundi. Published 28/10/2004, Call number:BR95 025 2000, Bloomsbury imprints and publications, Burns and Oates, London.

Wright, J. D. (2007). Homelessness. In: Encarta Encyclopaedia. Microsoft® Student 2008 (DVD). Microsoft Corporation, Redmond, WA.

Wikipedia, the free encyclopedia (Feb. 2017). Poverty Retrieved On 21/2/2017 from <https://en.wikipedia.org/wiki/poverty>

Oboh Felicia O. (Mrs) Is a Lecturer in Biology, Federal College of Education (Technical), Gusau, ZamfaraState, Nigeria.