Chapter Six
ACHIEVING THE MILLENNIUM DEVELOPMENT GOALS IN NIGERIA THROUGH SCIENTIFIC INNOVATIONS

By

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Abstract

Stronger Worldwide Capacities in science innovations is necessary to allow humanity to achieve the United Nations Millennium Development Goals. A concerted global effort among the Worlds' Scientists, Engineers and Medical experts is needed to identify good strategies which can help implement effective programmes, sustain progress in reducing poverty and related problems that require strengthened institutions for science, technology and innovation throughout the world at large and Nigeria in particular. This paper highlighted various programmes embarked upon by the government of Nigeria such as the National Economic Empowerment and Development Strategy (NEEDS), the National poverty Eradication Programme (NAPEP), the National Basic Education Programme (UBE) etc. and how they are faring. We have also drawn different ways through which a strong institution

for science, technology and innovation can help Nigeria actualize the MDGs.

Introduction

The last century ushered in a new millennium- a millennium with its hopes, aspirations and fears for its billions of inhabitants. Towards the end of the last century, various far-reaching agreements were made at the numerous conferences of the United Nations with its collaborating agencies. The enormous burden of extreme poverty, ill health, environmental degradation and natural diseases posed significant threat to peace, stability and development and hence continued human existence (Annan, 2006). The fears were palpable and so were the efforts at combating the problems.

In September 2000 at the summit held in New York, USA which witnessed the most largest-ever gathering of Heads of State in the world history endorsed the millennium declaration and was endorsed by the 189centuries including Nigeria. The declaration was then translated into a roadmap setting out to be reached by 2015. These goals, eight in number, became known as the millennium Development Goal (the MDGs). The MDGs^ represent a worldwide collaborative effort to reduce poverty and hunger, tackle ill health, gender inequality, lack of education, lack of access to clean water and environmental degradation (United nations General Assembly, 2000s, WHO, 2006),

Notable conferences were held worldwide in order to actualize the UN millennium Development Goals. Popular among them were the world food summit (WF) in Rome in 1993; the international conference on pollution Development (ICDP) held in Cairo in 1994; the 4th world conference on women (4WCW) in Beijing 1995; 5years post 4WCW (4WCW+5) in Washington DC in 2000; Roll back malaria summit (RBM) in Abuja in 2000. Most of these summits and conferences touched on various areas affecting

development and existence. Various targets and strategies were set to achieve these goals. The millennium summit was a revolutionary attempt to synthesize these various strategies and targets into what became the MDGs. The goals set for 2015 were based on the 1990 figures (Travis, Bennett, Haines, Pang, Bhutta & Hyder ,2004; WHO, 2006 United Nations General Assembly, 2006; Anthony, Olabisi, Abdou, Taye Afo'ayan, 2009).

The magnitude of problems facing mankind is enormous (Anan, 2006 and Kelly, Walt & Andy, 2004). This ranges from natural to man-made. Natural disasters like hurricanes, foods, earthquakes and droughts have resulted in great catastrophes rendering hundreds of thousands homeless and dire needs for food, clothing, shelter and medicine. Wars, ethnic strife, racism, genocides and various conflicts have plunged many regions into perpetual poverty, disease and hunger. The overwhelming debt burden and bad governance in many of the underdeveloped countries have in no small way contributed to the precarious situation (Killik, 2004). Despite massive industrialization, gross inequity in wealth distribution has left a majority of mankind in want and in some cases, terrible squalor. With over 1billion people living on less than one dollar per day, and a similar number threatened by food insecurity, risen cases of HIV and debt burden, increasing maternal and child mortality, rising unemployment and widening gap between the rich and the poor, the millennium summit could not have come at a more auspicious time (Anan, 2006, Kelley et al, 2004, WHO, 2002 and Report of the international Conference on oncoming financing development Goals, 2004).

Nevertheless, sight must not be lost on the fact there have been a preceding discrepancy between setting of

international goals and the interpretation and implementation of individuals and families in respective Countries. Policies and goals need committed action for implementation (Anan, 2006; Killik, 2004, Shiffman, 2004). It is in line with this that the paper intends finding ways through which science can help achieve the MDGs in Nigeria.

Contribution of science to human welfare

A nation's ability to solve problems, initiate and sustain economic growth depends partly on its capabilities in science, technology and innovation (Acharya, Daar & Singer, 2003). Science and technology are linked to economic growth; Scientific and technical capabilities determine the ability to provide clean water, good health care, adequate infrastructure and safe food. Without strong institutions for science, the country cannot have competent Engineers, technologists/technicians or medical doctors (Trisma, Josiah, Ikyumbur, 2010). Development trends around the country need to be reviewed to evaluate the role that science plays in economic transformation, in particular and sustainable development in general.

Improving the welfare of Nigerians is not only an end in itself; it is also intertwined the security of all countries, making development a truly global venture. Indeed, countries such as USA have started to classify human development challenges that are prevalent in developing countries, such as HIV/AIDS, as national security issues. This is the beginning of a process that recognizes the emergence of a globalize world that requires collective action to deal with issues once considered strictly national (United Nations, 2004).

This addresses Goal 8 "Building global partnerships for development" and "incorporation with the private sector, make available the benefits of new technologies, especially information and communications". Its remits has been broadened to include how science, technology and innovation can be enhanced and put to use to help all countries achieved without a framework of action that places science, technology and innovation at the centre of the development process.

Experts from anywhere in the world can help apply science and technology to assist developing countries like Nigeria to meet the goals. But if long-term goals are to be achieved and growth and problem-solving are to become indigenous and sustainable, Nigeria needs to develop her own capabilities for science, technology and innovation as a system of inter connecting capabilities, including governance, education, institutions, advice and collaboration (Amsden, 2001).

The Asian government put in place a task force in 2003 which was meant to complement, not replace, approaches. For example, science, technology and innovation play an important role in addressing the challenges associated with eliminating poverty and hunger in South East Asia as demonstrated below: At least three critical elements contributed to the rapid economic transformation of south East Asia and the Asian Pacific. These features are critical to achieving the goals throughout the world (Achibugi, 2003).

- Basic infrastructure, including roads, schools, water, sanitation, irrigation, clinics, telecommunications and energy.
- Small and medium-size enterprises that supply goods and services to the agriculture and natural resources

sectors. Developing these enterprises requires developing indigenous operational repair, and maintenance expertise and pool of local technicians. Without this base, indigenous industries cannot scale up and the economy cannot benefit from technology.

- Government support and funding to establish and nurture academics of engineering and technological science, associations, and industrial and trade associations. These human resources are supporting institutional frameworks spur sector wide innovations in development processes.

These features aided the Asian government in reducing poverty by contributing to economic development (by creating job opportunities and raising agricultural productivity, for example). They alleviate hunger by improving soil management, and creating efficient irrigation systems (Amsden and Chu, 2003). In themselves, however, these scientific and technological measures do not solve the challenges of poverty and hunger; they need to be part of an integrated strategy aimed at improving overall human welfare.

ICTs can increase primary, Secondary and tertiary education by facilitating distance learning, providing remote access to educational resources, and enabling other solutions. Many technologies hold the promise of significantly improving the condition energy sources, agricultural technology, and access to water and sanitation for example).

Many health interventions-including the treatment and prevention of malaria, HIV/AIDS, drug-resistant tuberculosis, and vitamin and other micronutrient deficiencies-require new treatment and vaccines. The production of generic

medicines holds promise of improving poor people's access to essential monitoring of drug quality.

Improved scientific as well as traditional or indigenous knowledge at the local level will be indispensable for monitoring and managing complex ecosystems, such as watersheds, forests, and seas, and help to predict (and thereby manage) the impact for climate change and the loss of biodiversity. Access to water and sanitation will require continuous improvement in how-cost technologies for water delivery and treatment, drip irrigation, and s...itation.

Possible areas through which innovation in science will help actualize the MDGs in Nigeria

Increasing access to energy is not a goal, but it is one of the five priority areas identified by the world summit on sustainable development. Energy is an important input into the development process. Considerable science and technological innovation can only take place when energy is generated and properly utilised; which will contribute to be of strategic policy interest for all countries. Over the years, the use of fossils fuel is unsustainable. Burning fossil fuel results in the emission of carbon dioxide and exacerbates the green house effect. About 80% of all climates warming are caused by emissions of carbon dioxide (Amsden, 2003). One promising solution for reducing these emissions is the development of small, environmentally benign power plants, units, and systems. The medium-term prospects for doing so are promising. Hydrogen fuel cells and gas-fuelled micro-turbines could be economically viable in the medium term, opening up new opportunities for expanding the base for energy sources. Venture capital investment in these technologies has increased dramatically in USA and giant powers manufacturers and large oil corporations are

scarcity in agriculture is generating interest in alternative approaches that reduce the amount of water used to produce a unit of grain. Attention is also now turning to the development of drought-tolerant crops using both conventional breeding methods and genetic engineering. These technologies need not only on modern technologies. The development of the Autonomous potable water unit in Uruguay illustrates the potential for creativity in the water sector in developing countries (Archibugy & Pietrobelli, 2003). The Autonomous potable water unit (APWU) was developed to convert "dirty" water into portable water without using large treatment installations. The device comes in three models. The smallest one is 6metres long and can be put into operation in 24hours. The large units are 13 and 18metres long and require 48hours to be put into operation. The APWU was designed in 1992 by engineers from the Uruguayan water supply enterprise at the request of army engineers concerned about the sanitary conditions faced by Uruguayan soldiers serving as UN peace keepers in Africa. The challenge was to create an inexpensive mobile, portable and autonomous water treatment plant able to meet the basic requirement of a traditional treatment plant. The first unit was installed in the Democratic Republic of Congo in 1993. Once the technology proved viable, the Uruguayan government financed the construction and installation of 120units across Uruguay, where the device has reduced water borne diseases, especially cholera. Following Hurricane Mitch, the Uruguayan government donated some units to Nicaragua and El Salvador; it donated another unit to Venezuela after the mud avalanche in the Guaira region. A small unit was donated to the village of Talwandi Sabo, in Punjab, India, in 2002, leading to hopes that India's demand for such units could reach 1,000

in five years Hungary and South Africa have also expressed interest in the technology. Negotiations between Uruguay and Brazil were on top gear. The two countries hope to use the technology to revitalize the metal working industry and promote employment.

Scientific innovations can enhance national stability and international security. Over time economic growth fuelled by innovations in science and technology can increase social cohesion, stability and democratization.

Brazil and Republic of Korea, for example, economic growth over past 40years led to a vicious circle in which forced labour and then an emerging middle class began to insist on greater social, economic, and political participation. Advances in education, science, technology and economic growth in these and similar economies are improving the prospects for both democracy and stability. Increases in democratic practices, economic growth and innovation normally lead a nation to increase its participation in international trading regimes (Arocena & Suts, 2001). As this occurs, the trading countries must establish wide range of harmonized practices, such as standards, regulations, and tariffs. Trade ties usually have positive effects on political relationships between countries. Indeed, democratic countries with trade interdependencies are usually less likely to go to war with one another. As scientific and technological innovations work to foster economic growth and political stability and democracy, countries become better international citizens and stakeholders in commission on human security (2003). They also become more open to understanding that security often has important non-military dimensions. The recent redefinition of HIV/AIDS by the United States as a security crisis is one example of this broadened view in the twenty first century. Most disputes

and conflicts in Nigeria revolved around access to land, commodities, religion or political and natural resources. These economic factors continue to play a role today. But increasingly, Nigeria will be made up of societies in which economic value will be derived from knowledge, especially scientific and technical knowledge. Unlike traditional sources of wealth like oil, knowledge is not scarce and can therefore grow at exponential rate. Knowledge-based societies will not develop without conflict of their own, but warfare based on mercantilism or land grabs will take different forms.

The Journey so Far in Nigeria

Nigeria is a signatory to the UN Millennium Summit declaration. Hence, the attainment of MDGs is an obvious policy thrust of the Federal Government. It possesses an office in the Presidency and various programmes of government are aimed at the various goals both directly and indirectly. These programmes include:

1. The reform programmes which aim at eliminating waste and driving the various sectors of the economy and national life of redundancy to that of progress.
2. The National Economic Empowerment and Development Strategy (NEEDS).
3. The National Poverty Eradication Programme (NAPEP).
4. The Universal Basic Education Programme (USE)
5. The National Health Insurance Scheme(NHIS)
6. The National Action Committee on AIDS (NACA) and its associated programme for prevention of maternal to child transmission of HIV (PMTCT) programme.
7. The National Programme for water tag "water for life"

8. The Roll Back Malaria Programme (RBM) and its associated Insecticide Treated Nets (ITN) and Policy towards improved malaria treatment.
9. The recent seven-point agenda of the late President Yar-Adua /)/£ which also gears toward bettering the life of Nigerians.

Despite these various programmes which were initiated by the government of Nigeria, barely five years ago, millions of her citizens are:-

1. Sunk deep into poverty and hunger.
2. Women still form a negligible minority in business and politics.
3. More than 3thousand children still die annually before the age of 5years-many from preventable diseases.
4. Maternal mortality still remains high and even rising mostly in where 100,000 still give births have been reported in Nigeria.
5. AIDS remains the leading cause of premature death in Nigeria and fourth largest killers in the country.
6. Malaria and Tuberculosis continue their unbolting rampage in endemic regions of Nigeria.
7. Most villages and cities like Makurdi and recently Bauchi still have cases of waterborne diseases like cholera.
8. The insecurity in the country has become alarming and national issue. Today in Nigeria every region is not safe or totally free from security threat. For instance, the Niger Delta militancy, kidnapping and land disputes are the order of the day. The Northern part of the country is characterised by religion and political crisis e.g Boko-Haram in Bauchi, Borno and recent Jos crisis and land disputes and political crisis in Benue, Taraba and Nassarawa States.

The Way Forward

In the words of Annan (2006), the former UN Secretary General, "we must break with business as usual". Success will require sustained action across the entire decades. The MDGs offer opportunity for provision of the likes of meaningful health to the people, viable agriculture, gender equality, security, water, and sanitation in Nigeria and the world at large. Nigerian government has to Intensify her efforts in combating poverty and hunger, women empowerment^ security, portable water, HIV/AIDS using the numerous programmes already highlighted; especially if the country is wishes to achieve the UN Millennium Development Goals in 2015 which is fast approaching.

Conclusion

Science is one of the least studied most especially in Nigeria. In spite of it being a critical source of productivity indeed; economic histories are currently changing man's understanding of human history, placing greater emphasis on the role of science. Scientific innovations have played a critical role in the spurring growth in industrial countries such as the USA, China, Wales and Japan etc. But the lessons derived from these experiences have not been applied in Nigeria, where science remains a marginal part of national growth strategies. Nigeria must understand that most goals cannot be achieved without a framework of action that places science, technology and innovation at the centre of the development process. Yes experts from everywhere in the world can help apply science and technology to assist her meet the goals but if long term goals are to be achieved and growth, Nigeria needs to develop her own capacities for science and technology.

References

Acharga, T, Daar, A.S, & Singer, P. (2003). ^Biotechnology and the U.N. Millennium Development Goals: Nature Biotechnology, 21(12), I434-36.

Amsden, A (2001). The rise of the; Challenges to the west from Late- Industrializing Economics. New York: Oxford University Press.

Amsden, A & Chu, W (2003). Beyond late development: Taiwan's upgrading policy. Cambridge, mass: MIT Press.

Andreassi, T (2003). Innovation in small and medium sized enterprises. *International Journal of Entrepreneurship and Innovation Management 3(1/2,)99*-106.

Annan, K (2006). United Nation's Secretary General's Message for the New Millennium. Available at http://www.Unorg/millennium/SR/report: 8(1). Assessed on 21st July, 2010.

Anthony, C, Olabisi, O, Abdou, S.S, Taye, A & Afolayan, E (2009). ""Achieving the Millennium Development Goals: An Assessment of water and Sanitation Intervention of the Karam Millennium Village, Nigeria. Available at http://www.sciencepub.net. Assessed on 21st July, 2010.

Archibugi, D & Pietrobelli, C (2003) The globalisation of technology and its Implication for Developing Countries- Windows of opportunities or further burden Technological Forecasting and Social Change 70(9),861-83.

Arocena, R & Sutz, J (2001). Changing knowledge production and Latin American Universities: Research Policy 30(8),1221-34.

Kelley, L, Walt, G & Andy, H (2004). The Challenges to improve global health-financing the MDGs. JAMA, 2911(21),2636-2638.

Killik, T (2004). Politics, evidence and the new aid agenda. Dev. Policy Rev.22:5-29.

Report of the International Conference on Incoming financing Development Goals". HM Treasury and Development for International Development, London, February 16, 2004. Available at http://www.hm-*tresury.gov.uk/documents/international-issues/global-new-deal/inter- gnd- globwolf.cfm.* assessed on 23rd July, 2010.

Shiffman, J (2004). Generating political priority for safe motherhood. *African Journal Rep. Health*8(3) j6-10.*

Travis, P, Bennett, S, Haines, A, Pang, T, Bhautta, Z & Hyder, N (2004). Overcoming health systems constraint to achieve the MDGs. The Lancel, 364(9437), 900-906.

Trisma, E.A, Josiah, M.M & Ikyumbur, T.J (2010). Physics Education as a tool for Revitalizing Nigerian Economy in the 21st Century. *Journal of Science College of Education Oju,* Benue State.5(1)

United Nations General Assembly. United Nations Millennium Declaration Resolution 55/2. September 18, 2000. Available at http://www.un.orR/millennium goals and http://millennium indicators.Un.org.

World Health Organisation. Measuring Progress towards health in the Millennium Development Goals. Available at www.who.int/mdg. Assessed on 23rd July,2010.