European Journal of Business and Innovation Research
Vol.3, No.2, pp.44-54, May 2015
Published by European Centre for Research Training and Development UK (www.eajournal.org)

ENVIRONMENTAL MANAGEMENT AND CONTROL EDUCATION IN NIGERIA

Dr. Ben. O. Uwadiegwu, MNITP, RTP –
Department of Environmental Management, Nnamdi Azikiwe University, Awka.

Dr. Edmund A. Iyi MNITP, RTP
Department of Urban and Regional Planning, Enugu State University of Science and Technology (ESUT) Enugu, Nigeria.

ABSTRACT: *The application of sophisticated technology in a laissez- faire economy to provide for the diverse needs of ever increasing population led to series of environmental stress and crises. The magnitude and complexity of these environmental problems evoked the raising of alarm from various quarters calling for urgent attention to the myriads of environmental problem issues, if man's survival will be guaranteed. These alarms created the pressure that later gave rise to environmental management and control discipline and profession. In practical terms, environmental management and control is multi-disciplinary in scope and requires the training of crops of professionals that will be equipped with critical and analytical skills to provide both preventive and corrective measures to address all dimensions of environmental problems. Thus, the environmental and control education aims at training and producing competent personnel that will be intellectually equipped with sufficient and relevant theoretical and technical knowledge as well as skills for dealing with the problems caused by developmental projects and also who will possess the multi-disciplinary perspectives to team up with other professionals to achieve sustainable development in various aspects of human endeavours. Regrettably, it is only 30 out of 107 Universities and other 52 degree/HND/NCE awarding tertiary institutions in Nigeria that offer environmental management and control education. This is abysmally too low and poor which partly explains why environmental problems appear intractable in Nigeria. For sustainable development to become feasible and realizable in Nigeria, environmental education must be made compulsory in all tertiary levels of education as well as in pre-tertiary schools. Environmental management graduates are trained to work in the public and non-public establishments and as well as possess adequate skills to set up their private consultancy firms and become employers of labour.*

KEYWORDS: Environment, management, education, preventive and corrective measures, multi-disciplinary, developmental projects.

INTRODUCTION

Historically, the earth as the home of man has never been without changes and modifications. Some natural events such as earthquakes, volcanoes, ocean movements, cyclones, tectonic activities e.t.c were the major sources of environmental hazards which resulted to widespread environmental modifications and diversitations. However, the advent of man on earth introduced new dimensions of environmental hazards resulting from the fact that man has to exploit the resource base of the environment to provide for his daily needs. The rate of exploitation of the

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

environmental resource base depended on the size of human population and the diversity of their needs that must be satisfied. During the early stage of human occupation of the earth the rate of exploitation of the environment was quite minimal because the population size and human needs were low and so the environmental effect was quite negligible. Even when human activities such as cutting trees for firewood or to construct shelter or grazing animals produced some environmental degradation, nature had the capacity to nullify or neutralize such adverse effects. What is causing anxiety now is that the magnitude of environmental problems is becoming overwhelming as a result of the increase in the tempo of developmental activities and projects in attempt to provide adequate sustenance for the population which is growing at a very fast rate.

CAUSAL FACTORS OF ENVIRONMENTAL PROBLEMS

1) Human Population:

Serious environmental problems started with the increase of human population on earth coupled with the diversification of the requirements to sustain such population because the environmental resources happened to be the only sources of sustenance which must be exploited to provide for the welfare of man. The rate of resource exploitation is a function of human population and the level of technology applied for the exploitation. As environmental raw materials are exploited via the application of various types of technologies and industrially transformed into various types of finished products consumed by man, a host of injurious by-products are produced which degrade the quality of man's environment. The rate of exploitation, production and consumption are population dependent which invariably determine the rate of production of environmental externalities in the form of obnoxious substances which pollute the environment – the air, water and land.

To capture the picture very well, it will be of interest to know the pattern of world population growth in order to understand the underlying factor behind the present scale of environmental problems. Starting from the agricultural era, some 13,000 year ago, the world population was estimated to be about 5 million. Ten thousand years later that is at the beginning of the Christian era the world population was estimated to have grown to 250 million. Between the year AD 1 and 1750 which marked the beginning of the industrial revolution, world population rose to about 720 million people which indicates that the world population nearly trebled within the period. In 1850 it rose to 1,171 million which indicates that between 1650 and 1850, a period of 200 years the population of the world doubled. By 1950 the world population stood at 2,486 million and by 1975 it was 4 billion people. From then to 1980 it exceeded 4 billion by 400 million (Onokerhoraye, 1985). By 1997, the population of the world was approximately 5.8 billion. Given that the annual growth rate of the world is 1.5%, it means that 2015 world population is about 6.6 billion. At this rate, 87 million people are added into the world every year (Botkin and Keller, 1998).

This scenario is also true in Nigeria. The population of Nigeria was about 17 million in 1921, about 21 million in 1931, 31 million as recorded in 1953 census and 55.67 million by 1963 census. By 2001 it was estimated to be 79.5 million. Even though that the 2006 National population census figure was controversial, Nigerian population is currently estimated to be a little above 140 million (Adedeji and Eziyi, 2000).

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

2) Technology

Bain (1937) wrote that technology includes all tools, machines, utensils, weapons, instruments, housing, clothing, communication and transporting devices and the skills by which they are produced and used. The Merraim-Webster dictionary defines it as "the practical application of knowledge especially in a particular area, and, a capability given by the practical application of knowledge". The truth is that the use of technology has increased the capability of man to accomplish virtually all he desires particularly in the area of resource exploitation, transformation and distribution. Technology has advanced from low technologies of 19th century to high technologies of today thus making it possible for nature to be subdued by man to a very large extent with attendant, devastitating consequences. Almost all of today's environmental problems stem from the application of advanced technologies in industries and factories, in agriculture, in energy, in transportation, in settlement development etc. many technological processes produce unwanted by-products, known as pollutants which degrade natural resources, to the detriment of the environment (Stiegler, 1998).

3) Laissez-Faire Economy

The Active Study Dictionary defines Laissez-faire as "allowing individual activities to be conducted without government control". Laissez-faire is a French terminology which signifies an economic environment in which transactions between private parties are free from government restrictions, tariffs, and subsidies, with only enough regulations to protect property rights. The phrase laissez-faire in French literally means "Let (them) do", but it broadly implies "let it be", "let them do as they will", or "leave it alone". This phrase was introduced in France in reaction against strict government restrictions on trade and commerce. Thus in the 1750s, Vincent de Gourney, an ardent proponent of the removal of restrictions on trade and the deregulation of industry in France, forged it into a larger maxim as his motto as "Laissez-faire et Laissez passer, le monde va de luxi meme", meaning "let do and let pass, the world goes on by itself". The slogan gained prominence in France and was proclaimed by the physiocrats in 18th century as being the core of economic principles to the extent that some famous economists such as Adam Smith not only supported the slogan but conceived it as the restoration of natural order, a system unhindered by the restrictions of government. Before long, this ideology spread to China, Sweden, Spain and after 1776 to United States. Later, businessmen and particularly British industrialists were quick to associate the idea with their own economic interests and propagated the idea that the state was to be merely a passive policeman, protecting private property and administering justice, but not interfering with the affairs of its citizens.

Nigeria operates Laissez-faire capitalism which many political economists regard as mixed economy, free enterprise or private enterprise. The implication of Laissez-faire capitalism is that individuals or groups of individuals operate chosen activities anywhere and anyhow without or with minimal control. This situation creates room for the environment to be abused with careless abandon and hence series of serious environmental problems (Okeke, 2002).

Implications

The combined effect of the operations of population increase, technological progress and Laissez-faire economic ideology is environmental disruption and catastrophes. This manifests in what is termed environmental problems typified as pollution, global warming, ozone layer depletion, land

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

degradation, biodiversity loss, deforestation, desertification, atmospheric contamination, flooding and erosion, climate change, surface and underground water shortages, food insecurity, waste disposal problems, slum, urban heat, noise, odour, transportation bottlenecks, landuse intensifications, ecological disorder etc. The interconnections between the three causal factors of population, technology and Laissez-faire practice were explicitly illustrated by Paul and Ehrlich as quoted by Madu (2001) and is given as I = PAT where I, stands for the environmental impact, P, for population size or growth rate, A, for level of technology measured as per capita consumption and; T, is the environmental harmful technology that supplies A.

The equation illustrates that the level of impact which people make on the environment is a function of the interaction of the three variables. Since each of the variables differs from place to place, the resultant environmental problems will vary geographically. Understandably, this simple equation may have held so many other factors constant, but the lesson it teaches is overriding.

Environmental Control and Management

The inevitable interaction between the main causal factors of environmental stress resulted to the production of series of environmental problems so diverse, and widespread and in the amount nature cannot neutrize. The manifestation of such problems became so much that alarm was raised in various quarters that unless some drastic preventive and correctives measures were urgently applied, the continued survival of man cannot be guaranteed. Environmental management relates to manipulations of the external influences on man, usually so that man can derive greater and lasting satisfaction from life and living. It implies taking measures to ameliorate the effect of the existing ones through remedial programs and to mitigate against the occurrence of new ones or repetition of common ones. Control on the other hand embraces the authority or power to dictate and direct and possibly change the cause of an action. This could be done by regulating, retarding or restricting the activities that adversely impact on the environment or a particular resource. Both control and management are motivated by the desire to discontinue and or prevent an undesirable state on one hand and to prolong and expand a desirable state on the other.

Policy Initiatives for Environmental Management and Control

Environmental problems transcend international boundaries and so exist in all regions of the world irrespective of the level of development. Some developed nations have shown their concern for environmental management by taking some invigorating steps which can be discussed under three initiatives as follows;

(1) **Global Environmental Consciousness**

This manifested as 1972 Stockholm Conference. This conference recognized that the greatest environmental problem is the threat posed by the existing gap between the developed and developing nations. Therefore one of the major concern of this conference was how the community of nations will evolve a new and more equitable international economic co-operation that will narrow socio-economic disparities amongst nations of the world.

(2) **1987 Brundtland Conference (Working Strategy)**

The key achievement of the conference include the setting up of World Commission on Environment and Development. The conference adopted the concept of "sustainability" as a global environmental policy strategy. The sustainability concept refers to the strategy whereby

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

the exploitation of natural resources are pursued in such a way that do not limit or reduce the potentials for meeting the needs of future generation. In 1993, the European Economic Commission put up a working definition of sustainability as "continued economic and social development without detriment to the environment and the natural resources on the quality of which continued human activity and further development depends". In other words, the concept of sustainability is a process in which the exploitation of resources, the direction of investment and demographic change are all in harmony and enhance both current and future potential to meet human needs and aspirations.

(3) **1992 Rio-de-Jenerio Earth Summit**

The main agenda of this summit was to solicit the political will and commitment of governments to incorporate the concept of sustainability in their development plans. This conference produced a document called AGENDA 21 – the blue print of actions on environment and development from 21st century and beyond. One of the key elements of this conference is the adoption of Environmental Impact Assessment (EIA) as a national instrument to control investment and activities. At the end of the conference, a sustainable development commission was set up. This commission, known as the Economic and Social Commission (ECOSOC) of the United Nation was charged with the responsibility for coordinating the implementation of AGENDA 21 (Okeke, 2002).

Approaches to Environmental Management

There are four main approaches for environmental control and management which are neither totally exhaustive nor mutually exclusive. The approaches are; Economic perspective, Ecological perspective, Scientific perspective, and Humanistic perspective.

1. **Economic Perspective**

From economic point of view, environmental control and management are seen in terms of the interaction of the mechanisms of supply and demand on one hand and production and consumption on the other. Accordingly, environmental problems arise as a result of mismatch between supply and demand or between production and consumption. The situation is more often such that the "operator" in the environment do not bear the full cost of the damage he caused to the environment because of laissez-faire condition. In other words, the public is subjected to excessive social cost because the economic mechanism do not compel operators to internalize their externalities. This unrestricted forces of the open market system tend to encourage the progressive degradation of the environment because the social cost of the degradation is passed to the local population and community rather than being absorbed as part of the real cost of operating the activities. From the economic point of view, the most effective environmental management measure is to force operators of activities to internalize whatever dis-amenities they produce in the course of operating their activities. This implies the application of the principles of "polluter-must-pay", particularly for the activities that constitute high risk pollution source (Uwadiegwu, 2009).

2. Ecological Perspective

From ecological dimension, development is inevitable but must be pursued as a sub-set of the ecological system. If this is done, it will be realized that an action taken in any one area or in any component must be related to other constituting components or with respect to other sub-sets of

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

the system. The ecologists believe that all major environmental disasters, resulted from disregard of environmental equilibrium and local carrying capacities. In other words for man to be in accord and harmony with nature, the limits of nature regarding the kind and amount of development that can be accommodated must be respected, and where such limits are disregarded, environmental catastrophe and disaster are the result. The ecologists then opined that adequate environmental control and management therefore requires appropriate ecological balancing of the elements that are necessarily in interaction in a particular environment. This balancing is essentially a carrying capacity analysis. This is the basis for the design and development of the concept of eco-development by Sachs (1978). Eco-development is a short hand for ecological sound development strategy which emphasizes the need for harmonizing economic, social and environmental concerns in the process of development. The argument is that if development must take place, man must be in contact with the environment, but to be in contact with the environment is not necessarily to abuse or degrade it. The concept of eco-development therefore recommends that man must co-operate with his environment in the process of his development. This co-operation requires that a good formal policy be articulated where the rules of the games are spelt out and machinery for enforcement put in place.

3. Scientific Perspective

Proponents of the scientific approach believe that most of the environmental problems emanate from the use of the products of science but also believe that science can be used to provide adequate answers to all environmental management questions. This school of thought is of the opinion that man should not only use his ingenuity, technological control and superiority to limit the damages that can be done to the environment and its resources in the course of development but more importantly that man should go further to convert whatever disamenities that may have been created to positive uses. The scientific view of environmental management also argues that man should use his technological knowledge to reverse negative environmental trends. Therefore, technology and ingenuity of man are recommended to be channeled towards more effective environmental management and control.

4. Humanistic Perspective

The humanistic perspective is essentially a maxist approach to environmental control and management. This approach criticized the other approaches on the ground that they did not make sufficient provision for the involvement of man. The other approaches are seen as being capitalist in orientation because central to them is the production of a surplus through the use of human resources, i.e, labour. The humanistic approach is of the view that no environmental control and management measures will be effective without man being at the core of the measures. For environmental control and management to be effective therefore requires that the values, experiences and perceptual meanings which people have of their environment must be incorporated and respected. The humanistic approach therefore advocates a societal restructuring which meaningfully increases the involvement and participation of people who will be affected by environmental projects through all the phases of conception, articulation, planning and implementation.

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

Environmental Control and Management Education

Environmental management education is a relatively recent academic and professional discipline. This follows the realization that scientific and technological advancement designed to provide sustenance for the teeming population has left negative externalities in its train. The complexity of this negative outcome of developmental pursuits demand the training of a crops of highly skilled man-power equipped from a multi-disciplinary perspective not only to ameliorate the fall-outs of our development but also more importantly to highlight the environmental impacts of our diverse developmental endeavours with a view to minimizing the effects and maximing the gains of advancement in science and technology.

Thus the students are trained in line with the following philosophical objectives;

i. To train students to develop competence to conduct research into all aspects of the environment, including human settlements, monitor the impacts of various developmental projects, whether public or private and report to appropriate agencies for mitigating policy initiative;
ii. to train students to acquire sufficient and relevant academic and technical knowledge and skills for dealing with the problems of the environment;
iii. to acquire through practical and field exposure and laboratory analysis the multi-disciplinary perspectives that bear on enlightened applications of measures for the problems of the environmental management;
iv. to learn to work in a team to achieve multi-disciplinary management objectives on the search for mitigating measures for dealing with the problems in the use of natural resources so as to achieve sustainable development;
v. to appreciate through theory and field work at various ecosystems in Nigeria and by so doing appreciate the unity in diversity and the complementality of sub-regions as the basis for achieving sustained Nigerian nation-building process;
vi. to acquire the competences needed to work in the various sectors of the Nigerian economy that impact on the environment;
vii. to develop skills for environmental auditing and or building up reliable geographic information system that leads to environmental enlightenment, environmental based policy and decision-making;
viii. to develop competence in rapid environmental data acquisition and data management techniques for practical problem solutions;
ix. to develop in students a wide range of useful competences to work in public or private organizations or for self employment to employ others;

Employment Opportunity

Graduates of environmental management and control have bright prospects of being engaged as senior personnel in public and private organizations. The opportunities are quite wide since all organizations, be it public or private, undertake activities that impact negatively on the environment. Therefore environmental managers are required to serve as arbitrators between activities and the environment in any organization. Some of the prospects are listed in Table 1.

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

Table 1: Job Prospects for Environmental Management Graduates

S/N	Private Sector	Public Sector
1	Self employed	Lecturers in Federal and State Universities, Colleges of Education, Polytechnics and Research Institutes.
2	Consultancy jobs (e.g United Nations, World Bank etc).	Energy Parastatals e.g. Power Holdings etc.
3	Oil companies (e.g. Mobil, ELF, Shell, Chevron, etc)	Oil and Gas – NNPC, Niger Delta Development Commission (NDDC)
4	Banks (e,g UBA, First Bank, Union Bank, Access, etc)	Water Basin Development Authority (e.g Anambra – Imo River Basin Authority)
5	Environmental Management Firms (e.g Environmental Impact Assessment Services, Waste Management	Federal and State Ministries as Administrators
6	Transport Corporation (e.g. Land, Air and Sea)	Local Government Administration
7	Housing Estate Developers	International Organizations
8	Lecturers in Private Universities, Colleges of Education and Polytechnics	Rural Development Authorities
9	Business/Trade/Manufacturing Firms	Urban Development Authorities
10	Oil and Gas Servicing Firms	National Commission (e.g. INEC, Energy, EFCC, etc)
11	Political Parties Secretariat Administrators	Town Planning Authorities
12	Agricultural Services and Supplies	NESREA, Water Corporation Boards
13	Information and Communication Technology Companies (MTN, Airtel, Etisalat, etc)	Environmental Management Boards (e.g. Waste Disposal, Pollution Control etc).
14	Construction and Engineering Company Administrators	Tourism and Sports Boards
15		Information and Communication Technology (Nigeria Communication Commission)
16		International Non-Governmental Organization
17		Military and Defence Organizations
18		National Space and Meteorology Agencies
19		Federal and State Infrastructure Development Boards
20		Railways, Airports, Seaports, etc

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

Mission Statement

To train well-equipped personnel on the complexities of man-development-environment relationships to meet future challenges. This complex global relationships can be diagrammatically simplified as in Fig. 1.

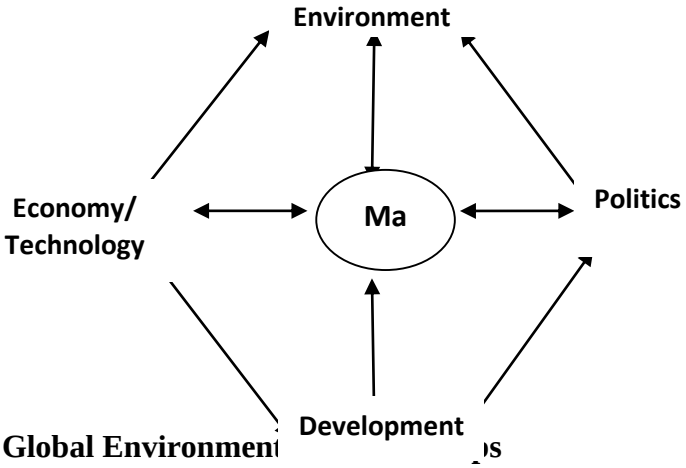

Fig 1: Global Environment

Environmental Management Education in Nigeria

The level of environmental management awareness in Nigeria is still very low, yet, it is the knowledge of environmental management techniques that can guarantee life sustainability in Nigeria. This low awareness is reflected in the number of institutions of higher learning that offer environmental management programmes which are domiciled in various academic faculties (see Table 2). The fact that it is scattered in various academic faculties indicates that there is no unifying philosophical anchorage of the programme which is a reflection of the fact that Nigeria is yet to understand what the programme is all about. In view of the fact that environmental education is the only strategy to create awareness, sensitize the public and for securing attitudinal changes in the man-environment equation, it is here recommended that it should be a compulsory programme in all institutions of tertiary education. Environmental management education is a necessity and a vehicle that will carry us to sustainable development.

Table 2: Environmental Management Education in Nigeria

S/N	Department	University	Faculty
1	Environmental management and Toxicology	University of Agriculture Abiokuta	Agriculture
2	Toxicology & Environmental management	Michael Okpara University of Agric, Umudike, Umuahia	Agriculture
3	Forestry/Wildlife & Environmental Management	Benson Idahosa University, Benin City	Agriculture
4	Soil & Environmental Management	Kogi State University, Anyigba	Agriculture
		Evan Enwerem University, Owerri	Agriculture
		Ebonyi State University, Abakaliki	Agriculture

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

		Crawford University of Apostolic Faith City, Ogun State	Agriculture
5	Geography & Environmental Management	Evan Enwerem University, Owerri	Management Sciences
		University of Illorin	Management Sciences
6	Environmental Education	University of Benin, Benin City,	Education
		University of Calabar, Calabar	Education
		University of Abuja, Abuja	Education
		Bayaro University, Kano	Education
		Abubakar Tafawa Balewa, University, Bauchi	Education
		University of Maiduguri	Education
		Ekiti State University, Ado Ekiti	Education
		Niger Delta University, Wilberforce Island	Education
		Rivers State University of Science and Tech., Port Harcourt	Education
7	Environmental Management Technology	Anambra State University, Uli	Environmental Sciences
		Abubakar Tafawa Belewa University	Environmental Sciences
		Novena University, Ogunme	Environmental Sciences
		University of Port Harcourt	Environmental Sciences
8	Environmental Management	Nnamdi Azikiwe University, Awka	Environmental Sciences
9	Environmental Resource Management	Abia State University, Okigwe	School of Technology
10	Environmental Management and Control	Igbinedion University, Okada	School of Technology
		Ekiti State University Ado-Ekiti	School of Technology
11	Resource Management	University of Calabar	Management Sciences

Source: UTME Brochure, 2014

CONCLUSION

Environmental Management education refers to organized efforts to teach about how natural environments function and, particularly, how human beings can manage their behavior and ecosystem in order to live sustainably. The term is often used to imply education within the school system, from primary to post-secondary. However, it is sometimes used more broadly to include all efforts to educate the public and other audiences, including print materials, websites, media campaigns etc. Environmental management education is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivation, and commitments to make informed decisions and take responsible action (Malore, 1999). Graduates of environmental management are keenly sought for and can be employed by public or private organizations but most importantly, they are analytically equipped to stand on their own as consultants on environmental management issues.

ISSN 2053-4019(Print), ISSN 2053-4027(Online)

REFERENCES

Adedeji, D and Eziyi, O. I. (2010), "Urban Environmental Problems in Nigeria: Implications for Sustainable Development", Journal of Sustainable Development in Africa, 12(1), No. 124-145.

Bain, R. (1937) "Technology and State Government", American Sociological Review 2, p. 860.

Botkin, B. D and Keller, E. A. (1998), Environmental Sciences, Earth As A Living Planet (2nd edition), John Willy & Sons (Pubs), New York.

Madu, I.A. (2001), "Population And Environmental Problems", Geographical Perspectives on Environmental Problems and Management in Nigeria, Ofomata, G.E.K. and Phil-Eze, P. O. (eds), Jamoe Enterprises, Enugu.

Malone, K. (1999), "Environmental Education Researches As Environmental Activists", Environmental Education Research, 5(2); 163-172.

Okeke, D. C. (2002), Environmental And Urban Renewal Strategies; Theoretical And Analytical Frameworks. Institute for Development Studies, UNEC, Enugu.

Onokerhoraye, A. G. (1985), Population Studies, Geography and Planning Series of Study Notes, UNIBEN, Benin City.

Sachs, I. (1978), "Eco-development: A Paradigm For Strategic Planning", World Development, 6, 967-969.

Stiegler, B. (1998), "Technique and Time: The Fault of Epimethens, Standford University Press, Great Britain.

Uwadiegwu, B. O. (2009), "Strategies for Achieving Integrated Approach for Environmental Upgrading and Management in Nigerian Cities", Journal of Business Studies And Research, 7(3), 186-201.

ISSN 2053-4019(Print), ISSN 2053-4027(Online)