SUSTAINABLE HUMAN DEVELOPMENT REVIEW
(An international multidisciplinary academic research journal)
Volume 4, Nos. 3&4, Dec., 2012 ISSN: 2006-8425

Editorial

Effects of improvement of funding of polytechnics education in Nigeria: The balance sheet dynamics and value creation models appraisal
– Ojatta, Dominic O. and Alani, Oyaka, Ganiyu O.

An analysis of traffic flow and network characteristics in Lagos Mainland, Nigeria
– Atubi, A.O. (Ph.D.)

Housing environment in Enugu Metropolis under the inflation pressures in Nigeria
– Emodi, Edmund Emeka

Periodic oscillations and cycles of fatalities from road traffic accidents in Lagos Nigeria
– Atubi, A.O. (Ph.D.)

Solid waste management in Enugu municipality: The challenge of public participation
– Onyenekenwa O. Eneh and Anamalu, N. (Ph.D.)

Book Review

Author’s Guide
SUSTAINABLE HUMAN DEVELOPMENT REVIEW
(An international multidisciplinary academic research journal)

The aim of the Sustainable Human Development Review, SHDR (an international multidisciplinary academic research journal) derives from the mission and objective of the Publishers, Welfare & Industrial Promotions (WIPRO) International, as follows:

Mission: Confronting the abounding development challenges in developing countries;

Objective: Using research, publication, conference, enterprise development and awareness creation to develop the total man in developing countries.

EDITORIAL BOARD

Prof. P.O. Ebigbo Editor-in-Chief, College of Medicine, University of Nigeria Teaching Hospital, Enugu.

Prof. S. N. Imenda Asst. Editor-in-Chief, Faculty of Education, University of Zululand, South Africa.

Prof. N.D. Onwuka Member, Department of Food Science & Technology, University of Nigeria, Nsukka.

Prof. I.U. Obi Member, Department of Crop Science, University of Nigeria, Nsukka.

Prof. P.O. Ajibola Member, Department of Chemistry, Ahmadu Bello University, Zaria.

Prof. E.O. Ukaejiofo Member, Faculty of Health Science & Technology, University of Nigeria, Enugu Campus.

Prof. J.F. Iyun Member, Department of Chemistry, Ahmadu Bello University, Zaria.

Prof. M. Mainoma Member, Nasarawa State University, Keffi, Nigeria.

Prof. P.A. Aka Member, Department of Pharmacology, University of Nigeria, Nsukka.

Prof. P.I. Ekwo Member, Department of Industrial Physics, Nnamdi Azikiwe University, Awka

Prof. P.O. Ukoha Member, Department of Pure & Industrial Chemistry, University of Nigeria, Nsukka.

Dr. V.A. Onodugo Member, Department of Management, Enugu Campus University of Nigeria, Nsukka.

Dr. F.I. Nwabue Member, Department of Industrial Chemistry, Ebonyi State University, Abakaliki.

Dr. Stephen Omodia Member, Department of Political Science, Nasarawa State University, Keffi, Nigeria

Eneh, O.C. Managing Editor, Institute for Development Studies, Enugu Campus University of Nigeria, Nsukka.

Egolum, R.K. Production Editor, Institute for Development Studies, Enugu Campus University of Nigeria, Nsukka.

ISSN 2006-8425

Welfare & Industrial Promotions (WIPRO) International
The Eastern Nigeria Industrial Estate, 30 Zik Avenue, Uwani, P.O. Box 9060, Enugu
Phone: +234-803-338-7472, www.wiprointernational.org
CONTENTS

Editorial 1

Effects of improved funding of the polytechnics education in Nigeria: The balanced sheet dynamics and value creation models appraisal
– *Ojatta, Dominic O. and Alani, Ganiyu O.* 5

An analysis of traffic flow and network characteristics in Lagos Mainland, Nigeria
– *Atubi, A.O.* 23

Housing environment in Enugu Metropolis under inflation pressures in Nigeria
– *Emodi, E.E.* 35

Periodic oscillations and cycles of fatalities from road traffic accidents in Lagos, Nigeria
– *Atubi, A.O.* 47

Solid waste management in Enugu municipality: The challenge og public participation
– *Eneh, O.C. and Anamalu, N.* 65

Book Review 95

Author’s Guide 99
CONTRIBUTORS

Dominic O. Ojatta
Principal Lecturer
Department of Marketing
Federal Polytechnics, Idah
Kogi State, Nigeria

Alani, Ganiyu O.
Principal Lecturer
Department of Accountancy
Federal Polytechnic, Idah
Kogi State, Nigeria

Atubi, Augustus O. (Ph.D)
Associate Professor
Department of Geography and Regional Planning
Delta State University, Abraka, Nigeria

Emodi, Edmund Emeka
Former Head of the Department of Environmental Management
Caritas University, Ugwuomu-Nike, Enugu, Nigeria

Onyenekenwa Cyprian Eneh
Senior research Fellow / Lecturer
Institute for Development Studies
Enugu Campus
University of Nigeria, Nsukka, Nigeria

Nkiru Anamalu (Mrs.)
Institute for Development Studies
Enugu Campus
University of Nigeria, Nsukka, Nigeria
EDITORIAL

Human development is a broad and comprehensive concept concerned with economic growth and its distribution, basic human needs and variety of human aspirations, and distress of the rich countries and the human deprivations of the poor. Going beyond economic development, which is concerned with income and growth, human development covers all human capabilities. It is “a process of enlarging people’s choices” created by expanding human capabilities.

Economic growth is essential for all human development because no society has been able to sustain the well being of its people without continuous economic growth. On the other hand, it is healthy and educated people that can contribute to economic growth through productive employment and increase in income. Thus, economic development is a means to human development. Hence, development theoreticians and practitioners must pay equal attention to economic development and human development.

Hitherto, emphasis has been on economic development – not on people’s adequate nutrition, access to safe drinking water, better medical facilities, better schooling for their children, affordable transport, shelter, secure livelihood and productive and satisfying jobs. It is to address this gap that the Sustainable Human Development Review (SHDR) was born January 2009 as an international multidisciplinary academic research journal. Its Volume 1 Number 1 of March 2009, Volume 1 Number 2 of June 2009, Volume 1 Number 3 of September 2009 and Volume 1 Number 4 of December 2009 kept to faith, courtesy of our esteemed contributors across the globe as well diligence and commitment of our dedicated reviewers and editors.

From SHDR Volume 2 Number 1 of March 2010, Editorial, which had been hitherto not considered necessary, was introduced, in conformity to the practice of globally acclaimed journals of academic research output. This Volume 4 Number 1&2 of March 2012 of SHDR presents another set of rich articles touching various topical human development issues.

The first article by Dominic O. Ojatta and Ganiyu O. Alani, both Principal Lecturers with the Federal Polytechnic, Ida, Kogi State, Nigeria, examined the improvement of Government funding activities in the Polytechnic sub-sector of Nigeria’s tertiary education from 2008 to date
against the backdrop of paltry funding of the past. Government implemented the CONTISS 15, the 53.37 % and 56 % salary upgrade and 7 % academic allowance for Polytechnics in the year 2009 and 2010 respectively. The Tertiary Education Trust Fund (TETF) also commenced interventions in sponsorships of conferences and staff graduate programmes for lecturers in 2008. The funding improvement was analyzed with the Balance Sheet Dynamics Model of Value creation. The paper argued that these developments have a likelihood of accelerating the process of value creation through the four asset components of the Balance Sheet Dynamics Model of value creation. It is recommended that Governments should intensify efforts in funding the sub-sector by extending the period of TETF interventions, offering University salary scale to Ph.D holders in the Polytechnics and striving to reach the 26 % education budget prescribed by UNESCO. Managers of education policies should equally engage the intangible value drivers to consolidate the gains of these policies on Polytechnic Education outcomes in the Country.

In the second paper, Atubi, A.O. (Ph.D), former Head of the Department of Geography and Regional Planning, Delta State University, Abraka, determined the contribution of the road network characteristics to traffic situation in Lagos Mainland. The analysis, via the graph theory, revealed that the road network of Lagos Mainland is not well connected and this also has some effects on the traffic situation. In determining the overall contribution of the road network characteristics, the multiple correlation statistics was used. From the analysis, it was observed that 82.81% of the traffic situation in the area can be attributed to the road network characteristics, leaving 17.19% to other factors. Based on the findings recommendations were proffered.

In the third article, Emodi, E.E., former Head, Department of Environmental Management, Caritas University, Ugwuomu, Enugu State, Nigeria, examines the impact of inflation, as a socio-economic phenomenon, on the housing environment in Enugu Metropolis. Results show that the Nigerian economy has been turbulently impacted by double-digit inflation rates. The impact reflects in the decline in gross domestic product, which invariably affects housing environment. It recommends pro-active steps by way of provision of housing units, among other measures, to minimise the pressures of inflation on housing environment.
In the fourth article, Atubi, A.O. (Ph.D) of the Department of Geography and Regional Planning, Delta State University, Abraka, Nigeria examined the periodic oscillations and cycles of fatalities from road traffic accidents in Lagos State, Nigeria. The variance spectra for Ajeromi/Ifelodun, Ikorodu, Badagry, Epe and Ikeja Local Government Areas showed no regularity in the occurrence of fatalities from road traffic accident patterns, although 32.00 years is the most dominant cycle. However, Local Government Areas, like Lagos Island, Mushin and Lagos Mainland, showed some regularity in the occurrence of fatalities from road traffic accident patterns. Incidentally, these local governments were prone to accidents in Lagos State. The reported fatalities from road traffic accidents in Lagos State were compared using analysis of variance (ANOVA) techniques. The results showed that for the two factors, Local Government Areas and years, the F-calculated values of 19.62 and 9.72 respectively were higher than the F-tabular values of 1.57 and 1.46 respectively at 0.05 level of significance. It then implied that the means for each of the factors were significantly different. Based on the findings, policy recommendations were proffered on how to reduce the ugly incidence of road traffic fatalities in Lagos State and Nigeria in general.

In the fifth paper, O.C Eneh and N. Anamalu of the Institute for Development Studies, Enugu Campus, University of Nigeria, Nsukka investigated the the compliance of Enugu residents with the directives of the Enugu State Waste Management Authority (ESWAMA) in solid waste management (SWM) in Enugu municipality, against the backdrop of the criticality of SWM to the success of ensuring a healthy environmental quality. Results showed that residents significantly complied with all such directives, namely taking wastes to neighbourhood dustbin (75.5 %), bagging of waste meant for neighbourhood dustbin (77.5 %), cleaning the neighbourhood on the environmental sanitation day (usually one Saturday in a month) (77.8 %), and payment of sanitation rates (77.4 %).

We pray that all those whose papers could not make it in this issue would understand, and try to send better-quality papers for our globally competitive review process in future. We most sincerely congratulate those whose papers made it. We heartily thank all our esteemed contributors and enjoin them not to flag in their zeal for research and publishing, which are veritable tools for confronting abounding development challenges in
developing countries to the development of the total man. We welcome contributions in all disciplines across the globe (see Author’s Guide).

Contributors are also encouraged to take advantage of our high-quality and globally competitive sister journals, *Journal of Applied Sciences and Development* and *Technoscience Review* to stagger their academic outputs in our highly rated academic Journals, which are also published online (see [www.wiprointernational.org](http://www.wiprointernational.org)) for visibility and global ranking in line with modern practice.

**Peter Onyekwere Ebigbo**  
*Editor-in-Chief of SHDR*  
Professor of Clinical Psychology  
College of Medicine  
University of Nigeria Teaching Hospital  
Enugu, Nigeria  
Tel.: +234-803-343-2710
Abstract

The paper examined the improvement of Government funding activities in the Polytechnic sub-sector of Nigeria’s tertiary education from 2008 to date against the backdrop of paltry funding of the past. Government implemented the CONTISS 15, the 53.37 % and 56 % salary upgrade and 7 % academic allowance for Polytechnics in the year 2009 and 2010 respectively. The Tertiary Education Trust Fund (TETF) also commenced interventions in sponsorships of conferences and staff graduate programmes for lecturers in 2008. The funding improvement was analyzed with the Balance Sheet Dynamics Model of Value creation. The paper argued that these developments have a likelihood of accelerating the process of value creation through the four asset components of
the Balance Sheet Dynamics Model of value creation. It is recommended that Governments should intensify efforts in funding the sub-sector by extending the period of TETF interventions, offering University salary scale to Ph.D holders in the Polytechnics and striving to reach the 26% education budget prescribed by UNESCO. Managers of education policies should equally engage the intangible value drivers to consolidate the gains of these policies on Polytechnic Education outcomes in the Country.

Introduction

Education is a whole gamut of activities by which an individual is taught, learns and is trained in order to acquire skill in certain areas of life endeavors. Educational processes are normally grouped into primary, secondary and tertiary stages (Ojatta, 2006).

In Nigeria, the bane of educational enterprise has been the dwindling quality of teaching and learning outcomes. The quality of educational process outcomes has plummeted in recent times at all levels. There are cries over mass failure. The failure rate is high in the examinations conducted by both the National Examinations Council (NECO) and the West African Examination Council (WAEC). Consequently, many of the secondary school leavers with beautiful O’level results are no longer fit for both the tertiary education and the job market (Enah, 2010, 2009, 2008; Enah and Owoh, 2009; Enah and Enah, 2009, 2008 a,b)

The development of the requisite middle level manpower to transform Nigeria is placed at the very doorsteps of the polytechnics, monotechnics and their equivalents. According to Eze (2010), whereas education is the bedrock of all forms of economic developments, technical/technological education remains the only solid base for any technological development.
Dike (2009) observed that even though technical and vocational education (TVE) has been an integral part of national development strategies in many societies, Nigerian leaders have not given this aspect of education the attention it deserves.

Despite the vital position this sub-sector occupies in Nigeria, a lot of problems have beguiled the system. Even the university system has suffered a similar fate, as no Nigerian University made it in the ranking of top 500 world-class universities. The Nigerian tertiary education system has indeed suffered unimaginable neglect in terms of funding.

Another key problem in the sector is policy somersaults of the Federal Government. Eneh (2011) observed that Nigeria’s underdevelopment is more of poor implementation than lack of development visions and programmes. Policy somersault and development projects abandonment are common. In 2006, some Federal Polytechnics were to be taken over by selected Federal Universities. This did not, however, materialize. Another policy was that of allowing polytechnics to award Bachelor of Technology degrees. This, too, is yet to be implemented. Again, the policy on conversion of Kaduna Polytechnic and Yaba College of Technology to universities is another mirage.

Poor infrastructure, poor manpower, poor funding, poor remunerations and lack of any viable staff development programmes had prevailed until lately. Abandoned projects abounded on polytechnic campuses. Outdated equipment and laboratories also characterized majority of Nigerian polytechnics. Many laboratory and workshop equipment are old, dysfunctional, outdated and yawning for replacement. Epileptic electricity power supply, lack of stand-by electric power generating sets and high cost of fuel to operate electric power generating sets all militate against meaningful research and development on polytechnic
campuses. All these have demotivating influence on activities of these institutions.

To worsen the scenario is the problem of pay disparity between Polytechnic and the University employees which has been attributed to Government poor funding of the education sector. From Table 1.1, it is clear that the Federal Government of Nigeria has at no time met the 26 % education funding benchmark recommended by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). The highest Government ever went within the nine years under study was 1.3% in 2000 and 1.2% in 2002, which are nothing to write home about.

Out of the paltry allocations to the education sector between 1996 and 2002, the polytechnic sub-sector received an average of 17.8 %, as against 45.3 % for Universities, 9.5 % for Colleges of Education, 14.5 % for Secondary Schools and 11.6 % for Primary Schools, as indicated in Table 1.2. Fig. 1.1 also presents two curves. The upper one represents Federal Governments expenditure between 1997 and 2007, while the lower shows education portion of the budgets for corresponding periods. Surprisingly, the graph indicates that the government spent less on education in the years that her expenditure is highest. This means that education expenditures are inversely proportional to overall government expenditure. This indeed is a portrayal of the anomaly that has existed in funding of this critical sector in Nigeria.

Table 1.1: The Total Federal GDP and Education Budget (2000-2008)
### Year Total GDP Education Budget Percentages

<table>
<thead>
<tr>
<th>Year</th>
<th>Total GDP</th>
<th>Education Budget</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>4,582,127.3</td>
<td>57,956.64</td>
<td>1.3%</td>
</tr>
<tr>
<td>2001</td>
<td>4,725,086.0</td>
<td>24,522.27</td>
<td>0.5%</td>
</tr>
<tr>
<td>2002</td>
<td>6,912,381.3</td>
<td>80,530.88</td>
<td>1.2%</td>
</tr>
<tr>
<td>2003</td>
<td>8,487,031.6</td>
<td>64,782.15</td>
<td>0.8%</td>
</tr>
<tr>
<td>2004</td>
<td>11,411,066.9</td>
<td>76,524.65</td>
<td>0.7%</td>
</tr>
<tr>
<td>2005</td>
<td>14,572,239.1</td>
<td>82,795.06</td>
<td>0.6%</td>
</tr>
<tr>
<td>2006</td>
<td>18,564,594.7</td>
<td>87,294.56</td>
<td>0.4%</td>
</tr>
<tr>
<td>2007</td>
<td>20,657,317.7</td>
<td>107,529.39</td>
<td>0.5%</td>
</tr>
<tr>
<td>2008</td>
<td>23,842,170.7</td>
<td>164,000.00</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

Source: Computed from CBN Statistical Bulletin

#### Table 1.2: Federal Government Expenditure (%) by Education levels (1996-2002)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Universities</td>
<td>52.5</td>
<td>44.6</td>
<td>39.4</td>
<td>39.9</td>
<td>49.2</td>
<td>39.6</td>
<td>52.2</td>
<td>45.3</td>
</tr>
<tr>
<td>Polytechnics</td>
<td>16.2</td>
<td>23.2</td>
<td>17.0</td>
<td>18.5</td>
<td>17.0</td>
<td>16.6</td>
<td>16.0</td>
<td>17.8</td>
</tr>
<tr>
<td>Colleges of Education</td>
<td>11.2</td>
<td>11.1</td>
<td>12.0</td>
<td>10.6</td>
<td>9.6</td>
<td>11.9</td>
<td>9.7</td>
<td>9.5</td>
</tr>
<tr>
<td>Secondary schools</td>
<td>10.4</td>
<td>11.3</td>
<td>14.6</td>
<td>18.7</td>
<td>15.3</td>
<td>15.5</td>
<td>15.6</td>
<td>14.5</td>
</tr>
<tr>
<td>Primary schools</td>
<td>9.7</td>
<td>9.8</td>
<td>16.9</td>
<td>12.2</td>
<td>8.9</td>
<td>16.4</td>
<td>7.5</td>
<td>11.6</td>
</tr>
</tbody>
</table>

Source: Federal Government Annual Budget (Various Years)

Whereas the Universities, Colleges of Education, Nomadic education, Adult and Non-formal Education, Primary and Secondary Education sub-units are run by Commissions, the Polytechnics are run by a Board, the National Board for Technical Education (NBTE), (Moja, 2000). In the area of curriculum development, some NBTE syllabi in use in Nigerian Polytechnics today were produced in 1991 – over 20 years ago. They yawn for updating and lack in relevance. Consequently, there is low morale, low productivity, and brain drain among the Nigerian polytechnic staff and poor quality academic output in the sub-sector.
However, there seems to be a little light at the end of the tunnel in terms of increased funding. The recent increase in budget for the education sector is gradually having a bearing on the Polytechnic sub-sector. Funds are being provided through Tertiary Education Trust Fund (TETF) for infrastructural upgrading, staff development (higher degrees), and conference attendances for both State and Federal Polytechnics. CONTISS 15 was implemented for the Polytechnic from July 2009. The 53.7 % and 56 % salary increase for federal civil servants was also implemented in Polytechnics, especially the Federal Government-owned ones.

Several studies on funding of education in Nigeria have been carried out (Adewole, 2006; Babalola, 2001). Whereas Adegboyega (2002) and Babalola (2001) focused on funding of University education in Nigeria, none of the studies has yet assessed the funding of Polytechnic education vis-à-vis academic value delivery in Nigeria. In the light of these facts, this study was designed to fill this knowledge gap. Its main objective was to use the Balance Sheet Dynamics Model of value creation to project the likely impact of these recent developments on academic value delivery in the Polytechnic system in Nigeria.

**Conceptualizing Customer Value Creation**

Value, in itself, is the worth of a thing, a product or an idea. To the customer, value is the worth of a product or service mostly in monetary terms. No one parts with hard-earned money, if the product or service to be paid for is not at least of equal value with the money being demanded. Generally, the measurement of the value of a product or service is in financial terms.
Value creation is the process of carrying out activities that increase value of goods or services to the consumers, the employees and the investors. Smith (2007) observed that value creation for customers is a critical task for marketers. One way a marketer can distinguish himself in the market place is by engaging in various options of value creation. Successful organizations world-over do not create products or services, but values.
Value creation and delivery is not targeted at the customer alone. O’Malley (1998) submitted that businesses that must survive are duty-bound not only to create value for customers, but also for the employees, investors and suppliers as well. This means sustainable value management must be a chain and all-encompassing. Value creation, therefore, is the fundamental objective of any organization, whether profit or non-profit oriented. It is all about innovation delivery of changed offerings or values that match the changing needs of customers, employees and investors (Mitsuru, 2000; Moller, 2006).

**Elements of Value Creation**
The process of distilling knowledge and skills has been evolutionary in nature. Developments have led to shift in emphasis from the tangible to intangible drivers of value. The literature identifies innovation, ideas people and brand as the key elements of value creation. Intangible drivers, such as technology, innovation, intellectual property, alliance, management capability, employee relations, customer relations, community relations and brand value have been highlighted (Book Rags, 2011). Value drivers are organizations-specific. In a product marketing company, technology and innovation go a long way in positively transforming the quality of the product. Customers that value consistency in quality of a product are likely to have more positive attitude towards the organization that owns that brand. In a nutshell, any tangible or intangible factor that can be manipulated to offer the customer higher values in the market place is a value driver. In the polytechnic system, the employees and the processes constitute factors critical to positive learning outcomes.
The Balance Sheet Dynamics Model of Value Creation

Value creation involves a lot of dynamism. To the customer, the actors in value creation or depletion are the investors, employees and processes. These are interactive, iterative and interdependent elements quite critical to the model. These players function together, modulating one another in the process. A tilt on one driver will be balanced by the response from others. The dynamism within the system is such that when customer perception of a product or service value is positive, it leads to customer retention, which in turn, leads to revenue.

On the contrary, when customer value perception is negative, this will lead to loss of patronage, decline in revenue, and disappearance of profits and reduced expenditure on staff training, compensation and research and development (R&D) investments, as shown in Fig. 1.2. Where this occurs, it will further erode customer value, which in the long run, will lead to the closure of such business. The balance sheet dynamics is a mapping of organization’s key assets comprising of four “strategic balance sheets”, which focus on the key players. The number of “strategic balance sheets” and their contents are company-specific as mentioned earlier on. From this model (see Fig. 1.3), one can see that each of these boxes represent a “strategic balance sheet” containing assets to the organization. The first two sheets indicate employee and process assets. Businesses can create value only when they begin to see the employees and process elements as assets, and not items of expenditure.
An adequately trained, remunerated and motivated employee that uses up-to-date tools will be a miracle in customer value creation. The values, when properly perceived, will increase loyalty and push up the revenue of the business. A wise investor will not give out all profits, but reinvests some of it in employee and process assets. This ultimately leads to continuous growth and profitability.

To relate the model of value creation to Nigeria’s Polytechnics, we shall take a look at recent changes in the Polytechnic sector and “fit” them into an adaptation of the Balance Sheet Dynamics model. One way of building an understanding of these dynamics is to identify the key capabilities, resources and relationships that are of critical value creation in the Polytechnic sub-sector. The Federal Government through National Board for
Technical Education (NBTE) seems to have arrived this point as far as technical/technological education is concerned. We now take a close look at the “strategic balance sheets” in the adapted model (Fig. 1.4).

Fig. 1.3: Balance Sheet Dynamics  
* Source: O’Malley (1998)

The Employee Assets  
In a period of five years (2008-2012), the academic staff of Nigerian Polytechnics has had a lot of privileges capable of keeping them in top form for value delivery. Lecturers can now go for graduate degrees anywhere in the world with full sponsorship from TETF. The Agency also has an annual budget for conference sponsorships anywhere in the world. The CONTISS 15 implementation enables career progression to level 15 for Polytechnics employees. It placed academic and non-academic staff on equal pay pedestal. Reversing this has also created a 7 % allowance, which acts as a further impetus for value creation. Government also approved the 53.37 % and 56 % salary upgrade
for Polytechnics in July 2009. These developments could translate into value creation for academic staff of Polytechnics in Nigeria.

More investment in employee assets & growth

Value for students

More investment in employee assets & growth

Reinvestment in Polytechnic Infrastructures

**Infrastructures/Equipment**
- New lecture halls
- More Staff offices
- Central Library
- Lab. Equipnts
- Lap tops
- Internet services

**Economy**
- Efficiency in Employment
- Higher productivity
- Technological take off
- Increasing GDP
- Reduced inflation
- Increased Naira value
- More funds

**Employees**
- CONTISS 15
- 53.37% & 56%
- 7% Academic allowance
- TETF Conference Sponsorships
- Staff devpts.
- Higher degrees

**Students**
- Quality teaching
- Updated lecture
- Decline in extortion
- Better practicals
- Closer supervision
- Employable
- Skilled students

**Fig. 1.4: Balance Sheet Dynamics Model of Polytechnic Education in Nigeria**

*Source: Author. Adapted from O’Malley (1998)*

**The Infrastructure/Equipment (R&D) Assets**
There has also been significant funds inflow for system upgrades in the Polytechnics within the same period. TETF interventions have been directed at construction of lecture halls and lecture auditoria, staff offices, modern laboratories, libraries and acquisition of machines and equipment for teaching and learning processes. The Agency has also sponsored laptop procurements.
for distribution to lecturers and academic departments. Internet services are being provided to aid virtual education in the sub-sector. Funds for consumables are now readily available for practical. This too is an impetus capable of exciting value creation and delivery in Polytechnic teaching and learning processes in Nigeria.

The Students Assets (Customers)
The students’ strategic balance sheet shows the values that can be delivered as a result of interactions between the first two sheets. Key among these values are quality teaching processes, quality lecture materials, better practicals for skill development, closer student project and student industrial work experience scheme (SIWES) supervisions and decline in extortion. These have the propensity to facilitate creation of a skilled middle level manpower, which is critical to the technological and industrial development in Nigeria.

The Economic Pay-offs
Properly trained graduates from the Polytechnics sub-sector, under the prevailing circumstances, will be of immense benefit to the economy. Key contributions of this development to the economy would include efficiency of employees, higher productivity, and improved technological development, improved GDP, reduced inflation and increased Naira value. Reduced inflation will occur because consumption and productivity will even out. This scenario will exist because more jobs will be created, since Polytechnic graduates would become employable. This would lead to more funds, which could constitute government reinvestment into the first two assets: employee assets and infrastructure/equipment and
R&D assets. And, so the cycle of value creation in Polytechnic education outcomes is enacted and continually re-enacted.

**Recommendations**

The following recommendations have become necessary:

1. Government should create a mid-term funding for the Polytechnic sub-sector because the weak educational foundations laid at the primary and secondary levels are placing a greater responsibility on the tertiary education level as a whole.

2. Government should also extend the period of TETF interventions so that more could be accomplished in terms of value creation for all the stakeholders in the Polytechnic sub-sector.

3. To handle the problem of brain drift from the polytechnic sub-sector, particularly to the Universities, lecturers who successfully acquire their PhD degrees should be given university salaries and other allowances to keep them in the sector.

4. Budget to the education sector should be elevated to the UNESCO mark of 26% of the Country’s GDP.

**Conclusion**

The development in the Polytechnic sub-sector of Nigeria’s education industry is significant, especially within the past five years. The sub-sector has witnessed improvement in funds inflow in order to address the necessity of upgrading the human capital and infrastructural development. The result is highly motivated staff to deliver value to students. In a foreseeable, well-trained
lecturers using state-of-the-art processes could create outstanding customer value. The various cycles of these processes are captured in the Balance Sheet Dynamics model.

The students of the Polytechnics too would reap off this scenario with value delivery in their desired academic callings. On graduation, these trainees get into the economy by way of employments, leading to efficiency and higher productivity, thereby expediting economic growth. From the world of theory, the workings of the balance sheet dynamics, as modified for the Polytechnics sub-sector, is projected to create value for the students, the employees of Polytechnics and the governments of the country both in the short and long runs.

References


AN ANALYSIS OF TRAFFIC FLOW AND NETWORK CHARACTERISTICS IN LAGOS MAINLAND, NIGERIA

Atubi, Augustus O. (Ph.D)
Department of Geography and Regional Planning
Delta State University, Abraka
Mobile: +234-803-745-0078; E-mail: atubigrp@yahoo.com

Abstract
This paper aims at determining the contribution of the road network characteristics to traffic situation in Lagos Mainland. The analysis, via the graph theory, revealed that the road network of Lagos Mainland is not well connected and this also has some effects on the traffic situation. In determining the overall contribution of the road network characteristics, the multiple correlation statistics was used. From the analysis, it was observed that 82.81% of the traffic situation in the area can be attributed to the road network characteristics, leaving 17.19% to other factors. Based on the findings recommendations were proffered.

Introduction
Empirical facts clearly show that all faces of public transportation in Nigeria – railway, water, road and air transportation – are to day in varying degrees of degeneracy. Nothing perhaps reveals the extent of the problem better than the situation in Lagos, where commuters daily engage in struggles in which only the fittest survive (Atubi, 2012a; Atubi and Onokala, 2004b).

There is no doubt that both the Federal and State Governments have over the years; invested enormous funds in
Atubi, A.O.  

Traffic flow and network in Lagos Mainland

public transportation. However, a growing economy requires a comprehensive and efficient transport system to move its goods and people to and from and within its boundaries.

Sada (1970), examined the role of political politie s influencing transportation facilities in metropolitan Lagos. He maintained that politics had more than desired influence on the city network and this is irrational to objective planning of transport network in such a large city. He also said that until the city was given a new dimension such as planning and reversing some existing policies, the traffic problem in Lagos would continue to be in existence.

Atubi (2009, 2008a; 2008b; 2007) and Onakomaiya (1978), suggested that transportation planning in a rapid growing city like Lagos should take into consideration the forces influencing the growth of urban traffic such as the growing population, the narrow roads and increase in car ownership.

Banjo (1989), in his study of the characteristics of the transport problems of Nigerian cities, found out that the key characteristic of the transport problems of Nigeria’s major cities is the chronic traffic congestion arising from inadequate road network and misuse and abuse of those provided. These have given an insight to the traffic situation in some urban centres in Nigeria and thus have helped in directing efforts at easing and understanding congestion in these areas.

Population growth as well as commercial growth at different locations stimulates the growth of transportation network and in this way the spatial interaction between nodes is apparent. Put in another way, both population and commercial activity increase stimulate increases in access routes to quicken the link or connection of these places with one another (Atubi, 2009; Atubi and Ali, 2006).

Wallace (1958), further expanded this observation when he stated that the level of traffic density be it freight passenger is a reflection of and the general characteristics of human occupancies of an area. Only those towns that are best blessed
with a network of roads will experience rapid growth than those not so well served.

Traffic flow has been a serious problem in Lagos Mainland. In this place, traffic jam, which is an extreme case of traffic congestion whereby vehicles are fully stopped for a length of time before moving again, is common. It occurs as a result of continuous increase in road space, utilization by vehicles and it is characterized by lower speed, longer vehicle queues and increase journey time (Atubi, 2012a and 2012b; Shopade, 2010; Atubi and Onokala, 2004a, 2004b).

The menace of road traffic congestion across the globe seems to defy immediate solution and like a dreadful monster it stares gallantly and ridiculously at erudite urban planners and administrators in industrialized and developed countries of the world. While the industrialized countries continue to use new technology such as the intelligent transportation system to exterminate the unpleasant negativity, most developing countries adopt absolute technology such as expansion and construction of more roads in cities which are not likely to be the solution to these bottleneck problem in most cases.

**Study area**

Three bridges, mainly the Carter, Eko and Third Mainland bridges, connect the Mainland Local Government Area to the Island (Fig. 2.1). Lagos Mainland Local Government Area is one of the 20 Local Government Areas of Lagos State. Prior to 1967, the Mainland carried the bulk of the residential buildings and thus its public functions in turn attracted other clientel functions like banking service, commercial industries and engineering firms.
Methodology
Hagget (1979) said “the flow of activities between two regions is directly related to their sizes and inversely related to the distance between them”. It is then on the basis of this that a base map of the area was produced showing the selected nodes and links. The first of the analysis include the analysis via the
graph theory. An analysis was also done via the multiple correlation statistics where the combined effects of the network characteristics were computed.

**Results/Findings and Discussion**

Fig. 2.2 shows a map of Lagos Mainland showing the distribution of the nodes and links in graph form. The nodes are defined as the major activity centres in the Mainland area with a volume of employment of nothing less than 500 people. The links on the other hand are defined as the routes connecting two nodes. The major bus stop’s in the activity areas has aided their location and a sample size of thirty four was chosen (Appendix 1).
To determine and establish the degree of association between the road network characteristics and traffic flow along the links the correlation statistics was used. Analysis was done on only three out of the four road network characteristics and these include the width of the road, the geographical alignment of the routes and accessibility of the routes. The fourth one – surface quality was left out due to the fact that all the roads considered in Lagos Mainland are tarred. The multiple correlation statistic
is used to ascertain the strength of the relationship between a dependent and a set of independent variables which may be two or more.

However, the multiple linear regression would have been used but we found that in most cases, the unexpected variables was too large. Appendix 2 contains the details of the calculations and the value obtained between the variables (route orientation \((x_1)\), width of the roads \((x_2)\) and accessibility indices \((x_3)\), is 0.91. The percentage in variation of traffic flow along the routes which can be determined by the 3 road network characteristics is got by squaring the multiple correlation value thus:

\[
R^2 = (0.91)^2 = 0.8281 \\
= 0.8281 \times 100 \\
= 82.81\%
\]

However, from this we can see that 82.81\% of the variations in traffic flow along the routes in Lagos Mainland can be explained by the road network characteristics leaving 17.19\% to other factors such as the large number of cars in the area, the landuse pattern and the under developed nature of the road network.

**Policy implications/Recommendations**

Staggering of office hours means the fixing of office hours at spaced intervals. This means that all workers would not leave for work at approximately the same time and the effect this has is to reduce the number of workers plying the roads during the peak hour and thus would lead to an easing of traffic conditions in the peak hours.

In Lagos Mainland for instance, office hours for most workers ranges from 7.30am to 4.30pm. This often leads to a mad rush between the hours of 7.00 and 8.30am due to the fact that workers struggle to beat the office hours. This often leads to a chaos because each wants to be the first to get to the office and in their bid to be disorderly, traffic jams occur on the roads
Atubi, A.O.  Traffic flow and network in Lagos Mainland

and this often stretches at times to way past 9.00am. it is hereby believed and advocated that if office hours are staggered over a longer interval, to some degree congestion during the peak hour could be reduced.

To some degree, congestion along the roads of Lagos Mainland stem from the fact that the existing facilities are not effectively utilized. To make the good use of the existing facilities is obviously desirable especially in such traffic management measures as one-way working, junction control and parking control. On most of the roads and at junctions the traffic lights which are provided are not made use of and the absence of traffic wardens on such roads worsens the situation. The fact that this idea of using the traffic light has failed in some parts of the region is due to bad planning, and lack of responsibility on the part of the law enforcement agents. In some areas the lights are not programmed to meet the flow of traffic in all directions and thus leads to congestion.

From our analysis, we saw that the road network characteristics contribute a total of 82.81% to the traffic situation in Lagos Mainland thus leaving 17.19% to other factors which could include the large number of cars plying the routes, the mismanagement of traffic and the dominance of indiscipline drivers to mention a few. It then follows that to ease traffic flow along the routes, better road network characteristics must be ensured, for example, the roads have to be better connected to improve their accessibility, also roads have to be widened to more lanes to increase their carrying capacity and these are especially true for the routes headed to the mainland. Better road network characteristics would not only lead to a faster flow of traffic along the routes, it would also make for a well structured road network system and also a faster pace at curbing congestion problems in the area of study.

Conclusion

It must be stated that for an improved efficiency of the road system, recognition of the road network characteristics and decentralization of the landuse pattern must be effected to
ensure a faster pace in curbing traffic congestion problem in the study area.

References
Atubi, A.O. Traffic flow and network in Lagos Mainland


APPENDIX 1: Names of the Nodes


APPENDIX 2: Analysis via the Multiple Correlation Statistics

Below are values for route orientation ($x_1$), width of the roads ($x_2$) and accessibility indices of the roads ($x_3$)
To compute the degree of association between route orientation ($X_1$), width of the roads ($X_2$) and accessibility indices ($X_3$) the following equation was used.

<table>
<thead>
<tr>
<th>x1</th>
<th>x2</th>
<th>x3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>48.3</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>54.5</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>42.1</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>49.3</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>56.6</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>67.2</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>54.4</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>48.8</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>59.1</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>54.5</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>54.4</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>62.2</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>52.3</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>52.4</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>59.3</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>61.6</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>54.1</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>52.4</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>57.3</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>56.8</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>60.4</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>57.6</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>67.0</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>60.1</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>44.4</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>43.7</td>
</tr>
</tbody>
</table>
Substituting with the formular therefore the following calculation were undertaken:

\[
R_{1.23} = \sqrt{r_{12}^2 + r_{13}^2 - 2r_{12}r_{13}r_{23}} / (1 - r_{23}^2)
\]

\[
R_{12} = 0.88 \\
R_{13} = 0.19 \\
R_{23} = 0.06
\]

\[
\begin{align*}
R_{1.23} &= \sqrt{(0.88)^2 + (0.19)^2 - (0.88)(0.19)(-0.06)} / (1 - (-0.06)^2) \\
&= \sqrt{0.77 + 0.04 - 1.76 \times 0.19 \times (-0.06)} / 1 - 0.00 \\
&= \sqrt{0.81 + 0.02} / 1 \\
&= \sqrt{0.83} / 1 \\
&= 0.91
\end{align*}
\]

R_{1.23} > r_{12}, r_{13}, r_{23}

\[
R_{1.23} = 0.91 \\
R^2 = (0.91)^2 \\
= 0.8281 \\
= 0.8281 \times 100 \\
= 82.81\%
\]
HOUSING ENVIRONMENT IN ENUGU METROPOLIS UNDER INFLATION PRESSURES IN NIGERIA

Emodi, Edmund Emeka
Centre for Environmental Management and Control
University of Nigeria, Enugu Campus
Email: emekaemodi.645@gmail.com
Mobile: +234-806-847-7323

Abstract
Inflation, as a socio-economic phenomenon, is a serious issue in development in developing countries, like Nigeria, because high inflation rate exerts pressures on domestic macroeconomic conditions, with the potential to derail the economy from the path of sustainable growth and development. This review study analyses the impact of inflation on the housing environment in Enugu, Nigeria. Results show that the Nigerian economy has been turbulently impacted by double-digit inflation rates. The impact reflects in the decline in gross domestic product, which invariably affects housing environment. It recommends pro-active steps by way of provision of housing units, among other measures, to minimise the pressures of inflation on housing environment.

Introduction
Inflation is a serious development issue not taken lightly by policy makers and analysts. In a developing country, like Nigeria, characterized by significant development imbalances and uncertainties, inflation has received much attention in recent times.
Its importance is premised on the assertion that high inflation rates can exert pressures on domestic macroeconomic conditions, with the potential to derail the economy from the path of sustainable growth and development (CBN, 2007). This invariably impacts on the housing environment.

Before the crude oil era in Nigeria, inflation rate had been very much negligible. However, with the booming era of crude oil in the early and middle 1970s, inflation rates have risen significantly, affecting many development parameters, including housing environment, in Nigerian society. This review study set out to examine the impact of inflation in Nigeria on housing environment in Enugu metropolis.

**Inflation and the economy**

In Nigeria, before the discovery of crude oil and its boom, agriculture had been the mainstay of the economy. The country had derived her foreign exchange mainly from the exportation of agricultural produce, like palm produce from eastern part of the country, cocoa from the west and cotton and groundnut from the north. Proper marketing of these products was factored into the economic planning. Commodity boards were established thus, Nigerian Palm Produce Board with its headquarters at Calabar for the east, Cocoa Board at Ibadan for the West and Cotton Board for the North. Research Institutes were also established to oversee the improvement of the agricultural produce. They include the Nigerian Institute for Oil Palm Research, Benin and Cocoa Research Institute of Nigeria, Ibadan (Emodi, 2005).

However, as the nation entered the oil boom era from the early 1970s, a lot of income started accruing from the oil sector, surpassing the income generated from agriculture. These incomes were used mainly to develop urban areas in the country. With increasing access to money by more Nigerians, people started living frivolously. Coupled with improved life/health facilities,
there was a rapid increase in the population in Nigeria from less than 56 million people in 1963 to more than 100 million in 1990s (NPC, 1963, 1991).

With increasing opportunities created in urban areas, many youths who were formerly engaged in agricultural activities in rural areas, drifted to the cities for white collar jobs, abandoning agriculture in the hands of old men and women in rural areas. This trend increased drastically the population growth in urban areas in Nigeria. According to the 1991 census, 42% of the country’s population was living in urban areas, as against 7.8% in 1921 and 19.23 in 1963 (Obienusi, 1998). These urban areas exerted considerable pull, such that even though formal employment tended to be difficult with the introduction of Structural Adjustment Programme (SAP) in 1986, the unskilled migrants could participate in the informal sector in what has been termed the “bazaar economy” (Muoghalu, 1996) and cheap labour supplies. This gave rise to what could be referred to as a premature tertiarisation of an undeveloped economy.

The growth in population and rising urban income raised through a chain reaction mechanism the prices of agricultural goods, the general price level and eventually workers’ salaries in the country. There was a rise in the demand for agricultural goods, following the growth in population. Since the demand was not met with adequate supply of these products, prices of these goods started to rise, moreso as both the federal and various State governments had abandoned agriculture for the crude oil revenue. Commodity Boards were scrapped, related research institutes were neglected, irrigation projects languished and mechanized form of agriculture was not encouraged. All these led to poor agricultural productivity and rapid increase in prices of agricultural products.

To prevent the continuous rise in prices of agricultural products especially food, Shagari’s administration (1979-1983) embarked on importation of food items, like rice through a
presidential task force. This entailed expending the scarce foreign exchange. Consequently, price level rose generally in the economy, as other items beside agricultural goods became affected. For example, prices of building materials went exorbitantly high.

Furthermore, the total neglect on agricultural sector led to dwindling exchange earnings from that sector. Coupled with drop in oil revenue, among other factors, the country adopted the policy of industrialization based on import substitution, which actually necessitated the use of protective measures. This again raised the prices of industrial products in the non-agricultural sector, thereby leading to further rise in prices.

**Determinants and pressures of inflation on the economy**

The trends in the growth of money supply and inflation in Nigeria tend to support the general view that inflation is largely a monetary phenomenon. Studies by the Central Bank of Nigeria for the period 1960-1994 confirmed that growth in money supply is the major determinant of inflation in Nigeria. In the period of high monetary growth (1988, 1990, 1992, 1994), inflation surged accordingly, though with some lag. As the increase in narrow money rose from 4.1% in 1986 to 43.6% in 1988, the inflation rate increased from 5.4% to 38.3% during the same period. Similarly, when the money supply growth increased substantially from 32.6% in 1991 to 54.4% in 1993, inflation accelerated also from 13.0% in 1991 to 57.2% in 1993 (Ogwuma, 1996).

With the decline in monetary growth in 1994, the inflation rate, which peaked at 72.8% in 1995 had declined significantly to about 50% by June 1996. Although there is a strong link between increases in the money supply and inflation, other factors, such as utilization rate, rainfall and exchange rate movement, do influence inflation pressures.
Emodi, E.E  

**Housing environment and inflation in Enugu**

Inflationary developments have obviously had some negative consequences on the economy. For instance, when inflation increased from 7.4% in 1990 to 57.2% in 1993, the growth in economic activities, as reflected in the movement of the gross domestic product, declined from 8.3% to 22.3%. This goes to confirm the emerging consensus that high inflation tends to engender low economic growth ultimately. By reducing the consumer purchasing power, inflation leads to a fall in the growth of aggregate demand. This could lead to increase in business inventories and further reduction in production. On the supply side, inflation increases the cost of the factors of production and leads to uncertainty in planning. These factors constrain investment which is critical to economic growth. Lack of economic growth on the other hand inhibits a nation’s ability to wholesomely tackle certain environmental issues, which may require huge financial involvement for appreciable impact to be made.

**Inflation and housing environment in Enugu metropolis**

Just as inflation has affected many other sectors, housing environment has drastically been adversely affected in Enugu metropolis. This could be seen in the availability and affordability of housing units in the area, generation and management of solid wastes, use of the available amenities/facilities, as well as the influence on the neighbourhood.

The human population has been on the increase within the metropolis in the last few decades as a result of rapid urbanization and subsequent influx of people. In 1953, the population was 63,000. This rose to 482,977 in 1991 and by 2006, the population was put at 722,664 (NPC, 2006). On the other hand, the number of housing units in the same area has not proportionately increased. The 2006 population and housing census showed that the total
number of housing units in the area was 169,422 (NPC/CENSUS, 2006). This is indeed, a far cry from what is required to meet the demands of the growing population in the metropolis. New buildings are not coming up fast because the costs of building materials are extremely high as a result of inflation in the country. Many people, both the owner-occupier and the landlord, cannot afford these prices.

As a result of the increase in the demand and decreases in the supply of housing units in the area, rental values of these units have gone so high that some people cannot afford to pay such rents any more. Some former inhabitants of the high density areas of Abakpa, Coal camp and others have vacated the units they previously occupied and found their ways to some of the shanties around the metropolis, like Ugwu Alfred and Ugwu Aaron. Most of these shanties are located in the hilly undulating terrain. As the natural covers of these terrains are removed to erect shanties, the areas are left bare. Whenever it rains, the situation encourages run-off down the base of the hilly terrain, bringing about flooding within the metropolis.

In the areas of public infrastructures and amenities, the governments have not been able to meet the demand because of high costs involved – no thanks to high and unabating inflation rates in the country. For instance, electric power generation increased from 1772.9 mw/hr in 1994 to 2763.6 mw/hr in 2004, amounting to a 55 % increase, compared to increase in consumption by 70.6% within the same period (CBN, 2004). Besides, the annual loss in the economy due to bad roads in Nigeria has been put at N133.8 billion (MAN, 2004). Hence, as a result of inflation in the country, facilities and amenities meant to service certain areas have been in short supply, and the available ones are being overstretched. The situation in Uwani - a medium density area is a case at hand. Most of the tenants, who could not afford the high rents demanded by their landlords in Independence
Emodi, E.E  

Housing environment and inflation in Enugu

Layout for the detached houses they occupied have resorted to looking for flats in the medium density areas of Uwani, where the rents are indeed lower. Hence, the area is being over populated, and the teeming population is still being serviced by the facilities put in place for the medium density population. Consequently, some of these facilities and amenities are being used beyond their carrying capacities, bringing about failures of these facilities in many cases and making the environment not conducive for human habitation.

Again, as inflation bites harder, the inhabitants of the metropolis, particularly the low classed, find it difficult to make both ends meet. They tend to make do with accommodation at the periphery of the city at cheaper rates, thereby deforesting the more the surroundings of the metropolis. Meanwhile, Agbazue et al (2010) observed that because plants absorb considerable amount of solar radiation and release water vapour through transpiration, forests moderate temperature and help to maintain even climate. Forests are also involved in the maintenance of hydrological cycle to bring about ideal climatic conditions. It is also generally understood that plants absorb carbon dioxide for photosynthesis and give out oxygen needed by man for the process of respiration. Thus, as the excessive carbon dioxide within the environment is naturally removed and the oxygen needed by man is released by plants, good climatic conditions for both man and other living organisms are maintained. However, Nwafor (2006) noted that Nigeria, like the rest of the entire counties of Africa, is considered highly vulnerable to climate change. Therefore, appreciable deforestation of the surrounding forested land around the metropolis tend to induce global warming, which invariably leads to climate change.

Though Cunningham and Cunningham (2005) asserted that waste is everyone’s business, it is becoming increasingly difficult for solid wastes to be given due attention within Enugu metropolis.
Over the years, the amount of solid waste has grown steadily because of growing population and changing lifestyle (Wright and Nebel, 2002).

In Enugu, the numerous and interlinked causes of urban solid waste management problems and the attendant economic, social and health costs as well as environmental and aesthetic costs are the inertia factor, the demographic factors, institutional factors as well as absence of public participation (Nwafor, 2008). Until the last few months Enugu metropolis was facing serious environmental problems of catastrophic proportions due to the astronomical increase in the volume and increasing diversity of solid waste generated within the metropolis. The solid waste management crises are amply demonstrated by the insalubrious conditions in Enugu metropolis and the drastic decline in the quality of the urban environment and aesthetics (Emodi, 2012).

In high density areas of the metropolis, it could be observed that, as a result of inflation, which has escalated the rental values of the housing units, many families that used to occupy flats have condescended to single tenement houses. Hence, a family of five or more could be seen occupying a room because the family cannot afford to pay the high rent for a flat. Furthermore, it was also observed that many families, which hitherto used to occupy flats alone, now go into sharing flats with neighbours. Hence, a block of six flats meant to be occupied by six families are now being shared by more than six families. The result is that waste generation is greater than what has been anticipated and provided for by the State Waste Management Authority. Hence, different areas within this vicinity are seen littered with a lot of household generated wastes unattended to. This, among other things, tend to pollute the air in the area through the offensive odour emitted by these wastes.

**Recommendations**
Emodi, E.E  Housing environment and inflation in Enugu

The following recommendations will help in proffering solutions to the present situation:

- In the case of residential property, occupation should be regarded as a need, which will not usually serve as a profit making venture. Consequently, both the federal and state governments should embark on realistic housing projects to provide residential accommodation to the generality of the people.
- The federal government should provide conducive environment for banks to conveniently grant long-term loan facilities to property developers. By so doing, private investors will be encouraged to participate in the business of property development to make more houses available in the market and force down rents.
- The government should be realistic in the implementation of the Land Use Act, as it concerns acquisition and allocation of land. Land acquired should be allotted to willing residential developers and not on basis of political leanings.
- The government should grant tax relief on residential property in order to further attract private investors.
- Both federal and state governments should encourage indigenous building materials industries to go into full production and optimal capacity utilisation, thereby lowering the costs involved in importing these materials. As overall cost is lowered, building materials will become available at cheaper prices. Thus, more developers will come into the business and more accommodations will be made available possibly at lower rate.
- Federal and state governments should be sincere in their housing programmes. Houses built should be allotted to people, who are really in need of accommodation and not
to political associates, who in turn see it as money making venture by placing high prices on the buildings. If buildings erected by government are allotted to genuine people in need of accommodation, it will go a long way towards alleviating pressures on few available private investments.

- Having created conducive atmosphere for private developers to be fully involved, the government can then come up with realistic statutory rent control measures, which will determine the maximum amount of rent that may be charged at a particular time for a given property.

Conclusion
Inflation in the country has brought about incessant increases in the values of residential housing units in Enugu metropolis. This has created worries in the minds of many inhabitants, some of whom have taken refuge at the periphery of the metropolis, defacing the entire environmental structure. It is become imperative take adequate steps to embark on proactive measures to reverse the ugly trend.

REFERENCES


MUNICIPAL SOLID WASTE MANAGEMENT IN ENUGU: THE CHALLENGE OF PUBLIC PARTICIPATION

O.C. Eneh* and N.P. Anamalu
Institute for Development Studies, Enugu Campus, University of Nigeria, Nsukka

* Author for correspondence: O.C. Eneh, Mobile: +234-803-338-7472, E-mail: esccha@yahoo.com, onyenekenwa.eneh@unn.edu.ng

Abstract
Public participation in environmental waste disposal is critical to the success of environmental sanitation agencies in ensuring a healthy environmental quality. This study investigated the compliance of Enugu residents with the directives of the Enugu State Waste Management Authority (ESWAMA). Results showed that residents significantly complied with all such directives, namely taking wastes to neighbourhood dustbin (75.5 %), bagging of waste meant for neighbourhood dustbin (77.5 %), cleaning the neighbourhood on the environmental sanitation day (usually one Saturday in a month) (77.8 %), and payment of sanitation rates (77.4 %).

INTRODUCTION
Solid wastes constitute a global problem because they are generated almost every minute in homes in different parts of the world. Statistics show that the United States of America generates
19% of the world’s total rubbish waste, despite their improved collection and disposal methods. Japan has 44%, Germany 2.9%, Korea 2.9%, Britain 1.8%, Canada 1.8%, France 1.5%, Australia 1.1%, and the rest of the world has 25%. Countries with high waste generation also have high waste problems. It is estimated that 30-50% of solid wastes generated within the urban centre remain uncollected. This leads to solid wastes accumulating on wasteland, streets, blocking the road and drainage channels with garbage. Other effects include fire outbreak, serious health hazard for children playing on the site (Okoroafor, 2005).

Globally, there is an increasing awareness of environmental planning and management. Municipal Solid Waste (MSW) management systems are becoming more complex in many countries with the move from landfill-based to resource recovery-based solutions, following the setting of international and national targets to divert wastes from landfill and to increase recycling and recovery rates. In developing countries, there is a much higher proportion of organics and considerable less plastic than in developed countries. The large amount of organic material makes the waste denser, with greater moisture and smaller particle size. Secondly, technologies used in industrialized countries are often inappropriate for developing countries. Even garbage trucks are less effective in developing countries because of the much heavier, wetter and more corrosive quality of their burden. Other technologies, such as incinerators, are often far too expensive to be applied in poor nations. Thirdly, cities and towns of developing countries are characterized by unplanned, haphazardly constructed, sprawling slums with narrow roads that are inaccessible to collection vehicles. Finally, there is often a much smaller stock of environmental and social capital in developing countries. People are unaware or uncaring of cradle-to-grave solid waste management needs, being more concerned with more immediate problems, such as disease and hunger (Ajadike, 2001).
Some studies have confirmed that in developed countries, the system of solid waste collection and disposal is efficient and so effort is concentrated on aspects like recycling. Authorities in developed countries have noted that the compositions of solid wastes vary, and therefore, resource recovery and recycling cannot be accomplished without the sorting of wastes into various components. Sorting and separation of solid wastes would be done manually or mechanically, depending on the volume of waste involved. Mechanical sorting is more expensive and is undertaken in developed countries. These wastes can be sorted at their sources of generation where they could easily be handled before collection by waste trucks (Sada and Odennerho, 1988).

According to Okoye (2008), the public waste management authorities do not measure up to the expectations of the citizens, as proved by the prevalence of wastes in all nooks and crannies of the cities. This poor performance in the collection and disposal of wastes can be traced to the nature of wastes generated, very few environmentally controlled disposal sites, often futile official efforts to develop recycling, financial constraint, inadequate infrastructure, high rate of population growth, and poor public perception or awareness.

To succeed in waste management for healthy environmental quality, the public waste management agencies in Nigeria need the participation of residents in areas of taking wastes to designated neighbourhood dustbin, proper waste bagging, cleaning the environment on environmental sanitation day (usually one Saturday in a month), and payment of sanitation rates. To improve on public participation, ESWAMA began to action non-compliance by instituting a special court for quick dispensation of justice in this regard.
Aim and objectives of the study
This study was aimed at assessing the level of response and participation in solid waste disposal by residents of Enugu city. The specific objectives of the study were to assess the level of public compliance with ESWAMA directives on:

1. Taking wastes to designated neighbourhood dustbin.
2. Waste bagging.
3. Cleaning the neighbourhood on environmental sanitation days (usually one Saturday in a month).
4. Payment of sanitation rates.

Hypotheses
Null hypotheses formulated to guide the study were:

1. Residents of Enugu city do not comply significantly with ESWAMA directive on taking wastes to neighbourhood dustbins.
2. Residents of Enugu city do not comply significantly with ESWAMA directive on bagging the wastes meant for neighbourhood dustbins.
3. Residents of Enugu city do not comply significantly with ESWAMA directive on cleaning the neighbourhood on environmental sanitation days (usually one Saturday in a month).
4. Residents of Enugu city do not comply significantly with ESWAMA directive on payment of sanitation rates.

Research questions
Do residents of Enugu city significantly comply with ESWAMA directive on:

1. taking wastes to neighbourhood dustbins?
2. bagging the wastes meant for neighbourhood dustbins?
3. cleaning the neighbourhood on environmental sanitation days (usually one Saturday in a month)?
4. payment of sanitation rates?

**Significance of the study**
By generating and documenting data on public participation in municipal solid waste management in Enugu city, this study will benefit planners, policy makers, administrators, waste management agencies, the academia and all stakeholders on environmental management. It will provide the much-needed data for capacity building for sustainable municipal solid waste disposal management in Enugu city, which will serve as a model for other cities in Nigeria. This will help to improve public participation in waste management and achieve a better environmental quality for the benefit of all.

**Scope and limitation of the study**
The study examined public participation in solid waste disposal in Enugu. It concentrated on the municipal solid waste only. Liquid waste, such as sludge, was not covered. Environmental problems, like air pollution, soil contamination and industrial wastes, were not covered.

**REVIEW OF RELATED LITERATURE**

**Conceptual framework**

**Early concepts of waste disposal**
Rubbish has long ago been disposed of, since it is in human nature to use up and dispose of waste. However, with the advent of industrial revolution, the disposal of rubbish increased because
people working in factories began to cluster to form cities. Before that, population was sparse and people were disposing of their refuse in their farm lands. During the first century of the industrial revolution, the volume of waste produced in the United States was relatively small and could be handled by a concept of “Dilute and Disperse”. Factories were built near rivers because the water provided a number of benefits, including easy transport of materials by boat, sufficient water for processing and cooling, and easy disposal of waste into the river. With few factories and a sparse population, dilute and disperse seemed to remove the waste from the environment. With more industries and urbanization, the concept of dilute and disperse became inadequate. A new concept known as “concentrate and contain” became popular. This means that the waste may be packed in a container, like drums, and contained. However, the problem with this is that the contents can leak when the container breaks, thereby allowing the waste to escape (Adedibu, 1988).

Waste disposal sites are necessary if society is to function smoothly. However, nobody wants to live near a waste site, be it a sanitary landfill for municipal waste, an incinerator that burns urban waste or a hazardous waste disposal operation for chemical material. The largest wastes disposal site in the world is located on a 1,500-Hectare site on Staten Island, New York. This facility is known as Fresh Kills and accepts approximately 15,000 metric tons/day of municipal and commercial waste collected in the city of New York (about half the city’s waste) and is expected to accept up to 20,000 tons/day. Yet, this colossus of waste disposal site will not be able to contain any more waste after years. Indeed, the problem of solid waste disposal is enormous.

Modern concepts of waste disposal
The environmentally preferable concept with respect to waste management is to consider wastes as resources out of place. We
may not be able to recycle and reuse everything, but the increasing cost of raw material, energy, transportation and land will make it financially feasible to reuse and recycle more resources. This is what is called industrial ecology – the industrial society functions more like an ecological system, where waste from one part of the system will be a resource for another part (Sadan and Odennerho, 1988). Some of the modern concepts of waste disposal are highlighted below.

**The integrated waste management (IWM)**
This new concept is best defined as a set of management alternatives, including reuse, source reduction, recycling, composting, landfill, and incineration. The three R’s of IWM are reduce, reuse and recycle. Their ultimate objective is to reduce the amount of urban and other wastes that must be disposed of in landfills, incinerators and other waste management facilities. A study of the waste stream in areas that practice IWM technology suggests that the weight of urban refuse disposed of in landfills or incinerated could be reduced by at least 50%. This may get up to as much as 70% (Mabogunje, 1990).

**On-site disposal**
A common on-site disposal method in urban areas is the mechanical grinding of kitchen food wastes. Garbage disposal devices are installed in the waste-water pipe system at the kitchen sink, and the garbage is ground and flushed into the sewer system. This effectively reduces the amount of handling and quickly removes food waste. Final disposal is transferred to sewage treatment plants, where solids remaining as sewage sludge still must be disposed of (Mabogunje, 1990).

**Composting and anaerobic digestion**
Waste materials that are organic in nature, such as plant materials, food scraps, and paper products, are increasingly being recycled.
These materials are put through a composting and/or digestion system to control the biological process to decompose the organic matter and kill pathogens. The resulting stabilized organic material is then recycled as mulch or compost for agricultural or landscaping purposes. This is a popular technique in Europe and Asia, where intense farming creates a demand for the compost. A major drawback of composting is the necessity to separate organic materials from other waste. Therefore, it is probably economically advantageous only when organic material is collected separately from other waste. Nevertheless, composting is an important component of IWM. There are a large variety of composting and digestion methods and technologies varying in complexity from simple windrow composting of shredded plant materials to automated enclosed-vessel digestion of mixed domestic waste. These methods of biological decomposition are differentiated as being aerobic in composting methods or anaerobic in digestion methods, although hybrids of the two methods also exist (Pidering, 1994).

The Green Bin program, a form of organic recycling used in Toronto, Ontario and surrounding municipalities, including Markham, Ontario, Canada, makes use of anaerobic digestion to reduce the amount of garbage shipped to Michigan in the United States. This is the facet of the 3-stream waste management system that has been implemented in the city and is another step towards the goal of diverting 70% of current waste away from the landfills. Green Bins allow any organic waste that in the past would have formed landfill waste to be composted and turned into nutrient-rich soil. Examples of waste products from the Green Bin are food products and scraps, soil papers and sanitary napkins. Currently, Markham, like the other municipalities in the greater Toronto area, ships all of its wastes to Michigan at a cost of $22 per tonne. Toronto and Ottawa are in the preliminary stages of adopting a similar programme. The city of Edmonton in Alberta, Canada has
adopted large scale composting to deal its urban waste. Its composting facility is the largest of its type in the world, representing 35% of Canada centralized composting capacity (Okoroafor, 2005).

**Incineration**

In incineration, combustible waste is burned at temperatures high enough (900-1000°C) to consume all combustible material, leaving only ash and non-combustibles to dispose of in a landfill. Under ideal conditions, incineration may reduce the volume of waste by 75% to 95%. In practice, however, the actual decrease in volume is closer to 50% because of maintenance problems as well as waste supply problems. This is approximately the same savings that could probably be realized from waste reduction and recycling. Besides reducing a large volume of combustible waste to a much smaller volume of ash, incineration has another advantage in that the process of incineration can be used to supplement other fuels and generate electrical power (Chukwurah, 1998).

Incineration and other high temperature waste treatment system are described as “thermal treatment”. In effect, incineration of waste materials converts the waste into heat, gaseous emissions, and residual solid ash. Other types of thermal treatment include pyrolysis and gasification. A waste-to-energy (WtE) plant is a modern term for an incinerator that burns waste in high-efficiency furnace/boilers to produce steam and/or electricity and incorporates modern air pollution control systems and continuous emissions monitors. This type of incinerator is sometimes called an energy-from-waste (EfW) facility (Chukwurah, 1998).

Incineration is popular in countries where land is scarce because it does not consume as much area as a landfill. Japan, Sweden and Demark all practice incineration. Demark extensively uses waste-to-energy incineration in localized combined heat and
facilities supporting district heating schemes. Incineration can be practiced also on a small scale by individuals and on a large scale by industries. It is recognized to be a practical method of disposing of certain hazardous waste materials, such as biological medical waste. Incineration of urban waste is not necessarily a clean process. Incineration may produce air pollution and toxic ash. For example, incineration in the United States apparently is a significant source of environmental dioxin, a carcinogenic toxin, and a controversy over incineration has resulted (Chukwurah, 1998).

**Open dumps**
In the past, solid waste was usually accumulated in open dumps, where the refuse was piled up without being covered or otherwise protected. Although thousands of open dumps have been closed in recent years and new open dumps are banned in the United States of America (USA) and many other countries, many are still being used worldwide. Dumps have been located wherever land is available, without regard to safety, health hazards, and aesthetic degradation.

Uchegbu (1998) posited that common sites are abandoned mines and quarries, where gravel and stone have been removed (sometimes by ancient civilizations); natural low areas, such as swamps or floodplains; and hillside areas above or below towns. The waste is often piled as high as equipment allows. In some instances, the refuse is ignited and allowed to burn. In others, the refuse is periodically leveled and compacted. As a general rule, open dumps create a nuisance by being unsightly, providing breeding grounds for pest, creating a health hazard, polluting the air, and sometimes polluting groundwater and surface water. Fortunately, open dumps are giving way to the better planned and managed sanitary landfills.
Sanitary landfills
A sanitary landfill is designed to concentrate and contain refuse without creating a nuisance or hazard to public health or safety. The idea is to confine the waste to the smallest practical area, reduce it to the smallest practical volume, and cover it with a layer of compacted soil. The layer restricts (but does not eliminate) continued access to the waste by insects, rodents, and other animals, such as seagulls. Sanitary landfill also isolates the refuse, minimizing the amount of surface water entering into and gas escaping from the waste (Pidering, 1994).

Historically, landfills were often established in discarded quarries, mining voids and burrow pit. A properly-designed and well-managed landfill can be a hygienic and relatively inexpensive method of disposing of waste materials in a way that minimizes their impact on the local environment. Older, poorly-designed or poorly-managed landfills can create a number of adverse environmental impacts, such as wind-blown litter, attraction of vermin, and generation of leachate, which is the result of rain percolating through the waste and reacting with the products of decomposition. The leachate produced by chemicals and other materials in the waste can pollute ground and surface water. Another by-product of landfills is landfill gas (mostly composed of methane and carbon dioxide), which is produced as organic waste breaks down anaerobically. This gas can create odour problems, kill surface vegetation, and is a greenhouse gas (Ponniah, 1998).

Leachate
The most significant hazard from a sanitary landfill is pollution of ground or surface water. If waste buried in a landfill comes into contact with water percolating down from the surface or with groundwater moving laterally through the refuse, leachate-noxious, a mineralized liquid capable of transporting bacterial pollutants – is produced. For example, two landfills dating from the 1930s and
1940s in Long Island, New York, have produced subsurface leachate trails (plumes) several hundred metres wide that have migrated kilometers from the disposal sites (Ponniah, 1998).

**Resource recovery**

A relatively recent idea in waste management has been to treat the waste material as a resource to be exploited, instead of simply a challenge to be managed and disposed of. There are a number of different methods by which resources may be extracted from waste: the materials may be extracted and recycled, or the calorific content of the waste may be converted to electricity. The process of extracting resources or value from waste is variously referred to a secondary resource recovery, recycling and other terms. The practice of treating waste materials as a resource is becoming more common, especially in metropolitan areas, where space for new landfills is becoming scarcer. There is also a growing acknowledgement that simply disposing of waste materials is unsustainable in the long term, as there is a finite supply of most raw materials. In some developing countries, resource recovery takes place by way of manual labourers who wade through the waste heap to salvage materials that can be sold in the recycling market (Oluwade, 2009).

**Recycling**

Recycling means to recover for other uses a material that would otherwise be considered waste. The popular meaning of recycling in most developed countries has come to refer to the widespread collection and reuse of various everyday materials. They are collected and sorted into common groups, so that the raw materials from the items can be used again (recycled) (Ponniah, 1998).
Health and environmental impacts of municipal waste management (MSW)

Warren et al (2004) enumerated the health and environmental impacts of municipal solid waste as exposure to toxic chemicals through air, water and soil media; exposure to infection and biological contaminants; stress related to odour, noise, vermin and visual amenity; risk of fires, explosions, and subsidence; and spills, accidents and transport emission. Environmental impacts can be clustered into six categories: global warming, photochemical oxidant creation, abiotic resource depletion, acidification, eutrophication, and ecotoxicity to water.

Landfills are associated with a plethora of health and social effects. Health and social impacts include odour nuisance, ozone formation (from reaction of NO\textsubscript{x} and non-methane organic compounds with sunlight) that can cause pulmonary and central nervous system damage, fire and explosion hazards from build-up of methane, an increase in the number of vermin (birds, rodents and insects) which act as disease vectors, and ground and air pollution from leachate and landfill gases. Water contamination by leachate can transmit bacteria and diseases. Typhoid fever is a common problem for the people of developing nations because many of them cannot afford to dig wells deep enough to reach fresh aquifers (Oluwade, 2009).

There are also many environmental impacts of landfills. Ozone formation can cause decreases in crop yield plant growth rate. Methane and carbon dioxide are greenhouse gases that contribute to global warming. Methane is twenty times more effective at trapping heat than carbon dioxide, and more persistent in the environment. Leachate from the landfill can enter groundwater systems, leading to increases in nutrient levels that cause eutrophication. Finally, bioaccumulation of toxins and heavy metals can occur.
Incineration impacts society by production of odours and in the unsightliness of the facility. There is also the potential for surface water pollution from waste waters (used for quenching hot ashes before transport). The most important health and environmental impact is from air emissions, which include particulates, carbon (II) oxide (CO), oxides of nitrogen (NO\textsubscript{x}), acid gases (chlorides and sulphides), volatile organics and mercury. These compounds contribute to bioaccumulation of toxins and acid rain. Inhalation of particulate matter poses a health danger. Smaller particulates are more likely to carry heavy metals, which can be retained in lung tissue and enter the bloodstream (Okapla, 1986).

Health and social impacts include noise, odour, and unsightliness. Actually, many of the micro-organisms found in compost are known as respiratory sensitizers that can cause a range of respiratory symptoms, including allergic rhinitis, asthma, and chronic bronchitis. Both composting and anaerobic digestions produce biogases, though less than landfills. Composting is aerobic and produces primarily carbon (IV) oxide (CO\textsubscript{2}), while anaerobic digestion produces methane (CH\textsubscript{4}). Both gases contribute to global warming (Okapla, 1986).

According to Uchegbu (1998), recycling can also pose health and environmental risks. Sorting facilities contain high concentrations of dust, bio aerosols and metals. Workers commonly experience itching eyes, sore throats and respiratory diseases. Environmentally speaking, recycling uses a large amount of energy resources.

Health and social side effects are equally as important as environmental impacts when considering MSW management. For people in developing countries, bodily well-being is a far more pressing concern than the fact that open burning of garbage contributes to acid rain or global warming. Outrage over health issues of poor waste management could, therefore, be a motivating
factor towards more sustainable environmental practices, as suggested in Dryzek’s discourse on green rationalism.

**METHODOLOGY**

**Research Design**
This research is basically a survey design research in that all the data used were collected with the use of questionnaire for the collection of primary data. The data sets presented here were based on the field work undertaken in Enugu in 2009. Layout maps of study area and photographs of locations of solid waste collection centres were collected and used to identify and analyse the problems involved.

**The study area**
Enugu State, Nigeria, has a population of about two million, while Enugu, the capital city, has a population of 722,664 (NPC, 2006). The people of Enugu belong largely to the Igbo ethnic group, which is one of the largest ethnic groups in Nigeria. The name Enugu comes from the two Igbo words *enu* and *ugwu* (“top of the hill”) (Okoroafor, 2005).

Enugu was originally the capital of the Eastern Region from Nigeria’s independence in 1960 until May 30, 1967, when it was declared the first capital of the short-lived nation of the Republic of Biafra. On September 28, 1967, when Enugu was captured by the Nigerian troops, the Biafran capital was moved to Umuahia (Emengini, 2004).

After the end of the Nigerian Civil War in 1970, the old Eastern Region was divided into three States, namely East Central, Cross River and Rivers. Enugu became the capital of East Central State. In 1976, the East Central State was divided into Anambra and Imo States, and Enugu remained the capital city of Anambra State. In 1991, Anambra State was split into two States, namely
Enugu State and Anambra State. Enugu retained the status of capital city of the newly-created Enugu State.

Enugu city comprises a number of layouts or neighbourhoods. They have been classified according to their population and population density levels, which are important because they characterize the nature and quantity of solid wastes generated in the city. They are the high-density neighbourhoods of Abakpa-Nike, Emene, Iva Valley, Ogui, Asata, Coal Camp, Uwani, Ogui New Layout, Obiagu, and Achara Layout; medium-density neighbourhoods of Awkunanaw, Maryland, New Haven, and Ugwu Aaron; and low-density neighbourhoods of Trans-Ekulu, Government Reservation Area (GRA), City Layout, Golf Estate, Ebeano Estate, Loma Linda, and Independence Layout (Okoye, 2008).

According to the Enugu Metropolitan Master Plan (1979), the high-density neighbourhoods commonly harbour upwards of 700 persons per hectare, about 70% of the city’s population, with predominant tenement house types susceptible to low-income habitation. The average monthly household income range was ₦20,000 - ₦50,000.

The medium-density neighbourhoods absorb about 28% of the entire city population with dominance of blocks of flats building type costing average monthly rent range of ₦10,000 - ₦20,000. Average density is between 350 and 400 persons per hectare. The average household of between 6 and 6.5 persons per household has been observed, with an average of 6 households per building. Their solid wastes are handled privately in the flats. One household generates an average of 10 kilograms of solid wastes daily, giving over 800 kg of solid wastes per hectare per day (Chukwurah, 1998).

The low-density neighbourhoods harbour about 2% of the urban population and cover not less than 20% of the urban areas. They have varying low densities of 18 to 60 persons per hectare.
Dominant house types include storey building, mansions and semi-detached duplexes. There are also appreciable number of bungalows and blocks of flats in these areas. However, the composition of these building types varies in these neighbourhoods due to the fact that some of them are “less exclusive” than others (Chukwurah, 1998).

Study population
The National Population Commission (NPC) (2006) gave the 2006 census populations of some of the neighbourhoods: Abakpa (80,200), Nike (80,025), Emene (70,021), Iva Valley (70,545), Ogui (80,020), Coal Camp (70,460), Akwuke (70,010), Obiagu (80,101), Garriki (70,132), Maryland (70,132), New Haven (40,017), Awkunanaw (40,360), Achara Layout (48,012), Uwani (40,584), Trans-Ekulu (12,828), GRA (14,237), and Independence Layout (12,326).

Sampling technique
The multi-stage sampling technique was used. First, the neighbourhoods were stratified into three, according to their known populations: 61,000 and above, 41,000-59,000, and 10,000-39,000. Secondly, a neighbourhood was purposively selected from each stratum to represent it.

<table>
<thead>
<tr>
<th>Stratum 1</th>
<th>Stratum 2</th>
<th>Stratum 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abakpa (80,200)</td>
<td>Achara Layout (48,012)</td>
<td>Trans-Ekulu (12,828)</td>
</tr>
<tr>
<td>Obiagu (80,101)</td>
<td>Uwani (40,584)</td>
<td>GRA (14,237)</td>
</tr>
<tr>
<td>Nike (80,025)</td>
<td>Awkunanaw (40,360)</td>
<td>Independence Layout (12,326)</td>
</tr>
<tr>
<td>Emene (70,021)</td>
<td>New Haven (40,017)</td>
<td></td>
</tr>
<tr>
<td>Ogui (80,020)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iva Valley (70,545)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coal Camp (70,460)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garriki (70,132)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maryland (70,132)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Akwuke (70,010)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Thirdly, a systematic selection of one out of every 20 households was made in the selected high-population neighbourhood; one out of every 10 households in medium-population neighbourhood; and one out of every 5 households in the low-population neighbourhood. Thus, Coal Camp, New Haven and Independence Layout were selected for the study. Their 2006 populations are 70,460, 40,017 and 12,326 respectively, totalling 122,830.

**Sample size determination**

The Taro Yammane statistical formula was used. This is given as

$$n = \frac{N}{1 + N(e)^2}$$

Where $n$ is desired sample population size  
$N$ is study population  
$e^2$ is 0.05 (level of significance)

Since, the total study population for the three selected neighbourhoods was 12,830, the desired sample size, $n$, was calculated as follows:

$$n = \frac{122,830}{1 + 122,830(0.05)^2} = \frac{122,830}{308.075} = 398.7$$

Therefore, 400 was used. The number was further shared proportionately among the 3 neighbourhoods, as follows:

Coal Camp: $\frac{70,460 \times 400}{122,830} = 230$
Method of data collection
Four hundred (400) copies of structured questionnaires were distributed to the selected neighbourhoods, as follow: Coal Camp (230), New Haven (130) and Independence Layout (30). The questionnaires were administered to volunteer or willing representatives of the selected households. Questions covered the demographic information about the respondent and the 4 research questions. Answer options were arranged in a 4-point likert-scale of Strongly Agree (SA: 4 point), Agree (A: 3 point), Disagree (D: 2 point), and Strongly Disagree (SD: 1 point).

Data analysis and test of hypotheses
The data were presented in frequency tables and simple percentage tables. The average mean score (AMS) technique was used to test the hypotheses. The AMS was obtained by taking the average of all the options (4, 3, 2, 1), as follows:

Total score = $4 + 3 + 2 + 1 = 10$
Average Mean Score = $\frac{10}{4} = 2.5$

For the collated answers and their scales from the selected neighbourhoods,

$$CV = \frac{\sum fx}{\sum f}$$
Where f is frequency

A calculated value (CV) was compared with the decision value (DV).

**Decision rule**

If DV > CV, H₀ is accepted as being true. But, if DV < C.V., H₀ is rejected as untrue and the alternative hypotheses will be accepted as true.

**RESULTS AND DISCUSSION**

Table 1 shows the distribution of questionnaires. Four hundred (400) copies of questionnaire were distributed as follow: 230 (Coal Camp), 130 (New Haven), 40 (Independence Layout). All of them were retrieved because of instant system of questionnaire administration.

Table 2 shows the demographic information on the respondents, covering 6 items as reflected in Tables 2.1-6. Fifty (50) or 12.5 % of respondents were of age bracket 20-24, 69 or 17.2 % of respondents were of age bracket 25-29, 144 or 36.1 % of respondents were of age bracket 30-34, 43 or 10.7 % of respondents were of age bracket 35-39, 57 or 14.2 % of respondents were of age bracket 40-44, and 37 or 9.3 % of respondents were 45 years and above. (See Table 2.1.) This shows that modal class of the ages is 30-34 years, constituting 36.1 % of the respondents. This is a healthy development because this group is a very active age group in the society.

The males were 73.3 %, while females were 26.7 % of respondents (see Table 2.2.) Those with some formal education were 87 %, while those without any formal education were 13 %. As many as 109 (or 27.3 %) and 118 (29.5 %) had tertiary and secondary education respectively (see Table 2.3). As many as 121
(30.3 %) had primary education, while 52 (13 %) had no formal education. This means respondents were enlightened members of the society, who must have understood the questions and given the answers solicited.

Traders were 43.5 % of the respondents, civil servants were 42.5 %, professionals were 5.8 %, students were 0.7 %, and non-classified respondents were 7.5 % (Table 2.4). Therefore, over 91 % of the respondents were economically independent and would not mind whose ox is gored in their offer of frank opinions solicited by the questionnaire.

The length of stay of the respondents is necessary for effective observation and knowledge of what obtains in the neighbourhood to be reflected in their answers to the questions. Those who had lived for less than a year in the neighbourhood were 7.5 %; 2-5 years were 11.2 %; 6-9 years were 37.2 %; and 10 years and above were 44.1 %. (See Table 2.5.) Thus, over 81 % of respondents had lived in the neighbourhood for 6 years upwards. This was a sufficient length of time to be aware of the goings-on in the neighbourhood. Particularly impressive is that respondents who had spent upwards of 10 years in the neighbourhood were over 44 %.

Awareness of ESWAMA and it activities came by the radio (29.8 %) to 119 respondents, by television (39.7 %) to 159 respondents, by newspapers (0 %) to no respondent, by fliers (0 %) to no respondent, by public forum (0 %) to no respondent, and through friends 30.5 % or 122 (Table 2.6). Respondents knew about ESWAMA and its activities through various means, except newspapers, fliers and public fora.

Table 3 shows the technical information from the respondents, covering the research questions as reflected in Tables 3.1-4. About 38.7 % of respondents strongly agreed that residents significantly complied with ESWAMA directive on taking refuse to the neighbourhood dustbin, while 36.8 % agreed. Only 16.8 %
of respondents disagreed, and 7.7 strongly disagreed (Table 3.1). Thus, 75.5\% of respondents agreed, while 24.5\% disagreed. Therefore, the public significantly complied with ESWAMA directive on taking refuse to the neighbourhood dustbin. This development could be attributed to ESWAMA court action against defaulters, as was confessed to the researcher by respondents. This is a heart-warming finding, especially as Okoroafor (2005) had observed that failure to collect 30-50\% of solid wastes generated within cities led to solid wastes accumulating to block the road and drainage channels with garbage, fire outbreak, and serious health hazard for children playing on the site.

About 37\% of respondents strongly agreed that residents significantly complied with ESWAMA directive on bagging of refuse meant for the neighbourhood dustbin, while 40.5\% agreed. Only 14\% of respondents disagreed, and 8.5\% strongly disagreed. Thus, 77.5\% of respondents agreed, while 22.5\% disagreed (Table 3.2). Therefore, the public significantly complied with ESWAMA directive on bagging refuse meant for the neighbourhood dustbin. This development could be attributed to ESWAMA court action against non-compliance, as was confessed to the researcher by respondents. Ekwuozor (2005) observed that the compositions of solid wastes vary and that resource recovery and recycling cannot be accomplished without the sorting of wastes into various components. Bagging wastes before taking them to public dustbin makes sorting easier before collection by waste trucks.

About 38.2\% of respondents strongly agreed that residents significantly complied with ESWAMA directive on cleaning the neighbourhood on the environmental sanitation day (usually one Saturday in a month), while 39.6\% agreed. Only 15.2\% disagreed, and 7\% of respondents strongly disagreed (Table 3.3). Thus, 77.8\% of respondents agreed, while 22.2\% disagreed. Therefore, the public significantly complied with ESWAMA
directive on cleaning the neighbourhood on the environmental sanitation day. This development could be attributed to ESWAMA court action against flouting the rule, as was confessed to the researcher by respondents.

About 37.2 % of respondents strongly agreed that residents significantly complied with ESWAMA directive on payment of sanitation rate, while 40.2 % agreed. Only 15.4 % of respondents disagreed, and 7.2 % strongly disagreed (Table 3.4). Thus, 77.4 % of respondents agreed, while 22.6 % disagreed. Therefore, the public significantly complied with ESWAMA directive on payment of sanitation rate. This development could be attributed to ESWAMA court action against defaulters, as was confessed to the researcher by respondents.

Hypotheses testing
The CVs for null hypotheses for the 4 objectives were 3.04, 3.07, 3.10, and 3.14 respectively (Table 4). The DV (2.5) was greater than each of the CVs. Therefore, all the null hypotheses were rejected as untrue, and the alternative hypotheses were accepted as true. Therefore, the public compliance with ESWAMA directive on taking wastes to neighbourhood dustbin, bagging of waste meant for neighbourhood dustbin, cleaning the neighbourhood on the environmental sanitation day (usually one Saturday in a month), and payment of sanitation rates was significant.

SUMMARY OF FINDINGS AND CONCLUSION
Public participation in environmental waste disposal in Enugu city has been investigated. There is significant compliance of the residents of Enugu with ESWAMA directives on on taking wastes to neighbourhood dustbin, bagging of waste meant for neighbourhood dustbin, cleaning the neighbourhood on the environmental sanitation day (usually one Saturday in a month), and payment of sanitation rates.
REFERENCES


### APPENDIX

**Table 1: Questionnaire distribution**

<table>
<thead>
<tr>
<th>Selected neighbourhood</th>
<th>No. administered</th>
<th>No. returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal Camp (HD)</td>
<td>230</td>
<td>230</td>
</tr>
<tr>
<td>New Haven (MD)</td>
<td>130</td>
<td>130</td>
</tr>
<tr>
<td>Independence Layout (LD)</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>400</strong></td>
<td><strong>400</strong></td>
</tr>
</tbody>
</table>

**Table 2.1: Distribution of respondents by age**

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 – 24</td>
<td>50</td>
<td>12.5</td>
</tr>
<tr>
<td>25 – 29</td>
<td>69</td>
<td>17.2</td>
</tr>
<tr>
<td>30 – 34</td>
<td>144</td>
<td>36.1</td>
</tr>
<tr>
<td>35 – 39</td>
<td>43</td>
<td>10.7</td>
</tr>
<tr>
<td>40 – 44</td>
<td>57</td>
<td>14.2</td>
</tr>
<tr>
<td>45 +</td>
<td>37</td>
<td>9.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>400</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Table 2.2: Distribution of respondents by sex**

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>293</td>
<td>73.3</td>
</tr>
<tr>
<td>Female</td>
<td>107</td>
<td>26.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>400</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Table 2.3: Respondents distribution by educational levels**

<table>
<thead>
<tr>
<th>Highest educational level attained</th>
<th>No. of respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No formal education</td>
<td>52</td>
<td>13.0</td>
</tr>
<tr>
<td>Primary education</td>
<td>121</td>
<td>30.3</td>
</tr>
<tr>
<td>Secondary education</td>
<td>118</td>
<td>29.5</td>
</tr>
<tr>
<td>Tertiary education</td>
<td>109</td>
<td>27.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>400</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Table 2.4: Distribution of respondents by occupation

<table>
<thead>
<tr>
<th>Occupation</th>
<th>No. of respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil servant</td>
<td>170</td>
<td>42.5</td>
</tr>
<tr>
<td>Trader</td>
<td>174</td>
<td>43.5</td>
</tr>
<tr>
<td>Student</td>
<td>3</td>
<td>0.7</td>
</tr>
<tr>
<td>Professional</td>
<td>23</td>
<td>5.8</td>
</tr>
<tr>
<td>Others</td>
<td>30</td>
<td>7.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>400</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 2.5: Distribution of respondents by length of stay in the neighbourhood

<table>
<thead>
<tr>
<th>Length of stay</th>
<th>No. of respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 year</td>
<td>30</td>
<td>7.5</td>
</tr>
<tr>
<td>2 – 5 years</td>
<td>45</td>
<td>11.2</td>
</tr>
<tr>
<td>6 – 9 years</td>
<td>149</td>
<td>37.2</td>
</tr>
<tr>
<td>10 + years</td>
<td>176</td>
<td>44.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>400</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 2.6: Sources of awareness of ESWAMA and its activities

<table>
<thead>
<tr>
<th>Source</th>
<th>No. of respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio</td>
<td>159</td>
<td>39.7</td>
</tr>
<tr>
<td>Television</td>
<td>119</td>
<td>29.8</td>
</tr>
<tr>
<td>Newspapers</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fliers</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Public forum</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Friends</td>
<td>122</td>
<td>30.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>400</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Table 3.1: Public compliance with ESWAMA directive on taking wastes to neighbourhood dustbin

<table>
<thead>
<tr>
<th>Response</th>
<th>Scale, x</th>
<th>Frequency, f</th>
<th>fx</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>4</td>
<td>155</td>
<td>620</td>
<td>38.7</td>
</tr>
<tr>
<td>A</td>
<td>3</td>
<td>147</td>
<td>441</td>
<td>36.8</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>67</td>
<td>134</td>
<td>16.8</td>
</tr>
<tr>
<td>SD</td>
<td>1</td>
<td>31</td>
<td>31</td>
<td>7.7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>400</td>
<td>1,226</td>
<td>100</td>
</tr>
</tbody>
</table>

\[ CV = \frac{\sum fx}{\sum f} = \frac{1,226}{400} = 3.04 \]

Table 3.2: Public compliance with ESWAMA directive on bagging of waste meant for neighbourhood dustbin

<table>
<thead>
<tr>
<th>Response</th>
<th>Scale, x</th>
<th>Frequency, f</th>
<th>fx</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>4</td>
<td>148</td>
<td>592</td>
<td>37</td>
</tr>
<tr>
<td>A</td>
<td>3</td>
<td>163</td>
<td>489</td>
<td>40.5</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>56</td>
<td>112</td>
<td>14</td>
</tr>
<tr>
<td>SD</td>
<td>1</td>
<td>34</td>
<td>34</td>
<td>8.5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>600</td>
<td>1,227</td>
<td>100</td>
</tr>
</tbody>
</table>

\[ CV = \frac{\sum fx}{\sum f} = \frac{1,227}{400} = 3.07 \]

Table 3.3: Public compliance with ESWAMA directive on cleaning the neighbourhood on the environmental sanitation day (usually one Saturday in a month)

<table>
<thead>
<tr>
<th>Response</th>
<th>Scale, x</th>
<th>Frequency, f</th>
<th>fx</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>4</td>
<td>153</td>
<td>612</td>
<td>38.2</td>
</tr>
<tr>
<td>A</td>
<td>3</td>
<td>159</td>
<td>477</td>
<td>39.6</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>61</td>
<td>122</td>
<td>15.2</td>
</tr>
<tr>
<td>SD</td>
<td>1</td>
<td>28</td>
<td>28</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>600</td>
<td>1,239</td>
<td>100</td>
</tr>
</tbody>
</table>
\[ CV = \frac{\sum fx}{\sum f} = \frac{1,239}{400} = 3.10 \]

Table 3.4: Public compliance with ESWAMA directive on payment of sanitation rates

<table>
<thead>
<tr>
<th>Response</th>
<th>Scale, x</th>
<th>Frequency, f</th>
<th>fx</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>4</td>
<td>149</td>
<td>596</td>
<td>37.2</td>
</tr>
<tr>
<td>A</td>
<td>3</td>
<td>161</td>
<td>483</td>
<td>40.2</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>62</td>
<td>186</td>
<td>15.4</td>
</tr>
<tr>
<td>SD</td>
<td>1</td>
<td>29</td>
<td>29</td>
<td>7.2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>400</td>
<td>1,294</td>
<td>100</td>
</tr>
</tbody>
</table>

\[ CV = \frac{\sum fx}{\sum f} = \frac{1,294}{400} = 3.24 \]

Table 4: Assessed aspect of public participation, null hypotheses, CVs and decisions

<table>
<thead>
<tr>
<th>Aspect of participation assessed</th>
<th>Null hypothesis</th>
<th>CV</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taking wastes to neighbourhood dustbins.</td>
<td>Residents of Enugu city do not comply significantly with ESWAMA directive on taking wastes to neighbourhood dustbins.</td>
<td>2.04</td>
<td>Reject n.h.</td>
</tr>
<tr>
<td>Bagging the wastes meant for neighbourhood dustbins.</td>
<td>Residents of Enugu city do not comply significantly with ESWAMA directive on bagging the wastes meant for neighbourhood dustbins.</td>
<td>3.07</td>
<td>Reject n.h.</td>
</tr>
<tr>
<td>Cleaning the neighbourhood on environmental sanitation days (usually one Saturday in a month).</td>
<td>Residents of Enugu city do not comply significantly with ESWAMA directive on cleaning the neighbourhood on environmental sanitation days (usually one Saturday in a month).</td>
<td>3.10</td>
<td>Reject n.h.</td>
</tr>
<tr>
<td>Payment of sanitation rate.</td>
<td>Residents of Enugu city do not comply significantly with ESWAMA directive on payment of sanitation rate.</td>
<td>3.24</td>
<td>Reject n.h.</td>
</tr>
</tbody>
</table>
BOOK REVIEW

Title: How To Survive Your Doctorate: What Others Don’t Tell You
Authors: Jane Mathiesen and Mario Binder
City Publication: Berkshire, England
Year of Publication: 2009
Page: 202
      10: 03353445 (pb) 033524437 (hb)
Price: N2, 200.00
Reviewer: Njoku, Collins Chibuzo
          Institute for Development Studies, Enugu Campus
          University of Nigeria, Nsukka
GSM: +234-8037405281, +234-8096328232
E-Mail: chibuzo4dev@yahoo.com

A Ph.D academic programme is not a cocktail party. It requires personal discipline, hard work, commitment, dedication, courage, patience, assiduousness, brain, relationships, networks and a granite-will. A geophysical law states that the higher you go, the cooler it becomes. But in academics or in the academia, it is the higher you go, the hotter it is. Hence, the Ph.D or Doctorate, being the zenith of an academic programme, requires an uncanny ability to navigate its labyrinthine maze which leaves in its wake high mortality rate. Survival becomes the name of the game, and a worthy metaphor.

The book, How to Survive Your Doctorate, therefore, comes across as a help desk, for all doctorate candidates or/and
students. Samplers: there is no reason for you to assume that people holding doctorate degrees are exceptionally intelligent and that you do not measure up to them and hence will never be able to get your degree (p. 9); a doctorate is difficult when you lack key motivational drivers like thirst for knowledge, challenging assumptions, curiosity, a desire to add to knowledge, and a willingness to conduct sound research (p. 8).

The book under review gives a holistic picture of the doctorate programme from application through to graduation. Each chapter covers a key issue for successfully completing a doctorate degree. The Introductory Chapter tells us who the book is for, why choose the book, how to read and use the book and the authors. Chapter Two describes the nature of research degree and the graduate school environment, specifically focusing on the big change a doctorate is often for people coming from undergraduate degrees, postgraduate taught degrees or industry and explains how to initiate the process. It is entitled “Getting Started”.

Chapter Three entitled “Managing the Self” provides top tips on how to overcome the serious and frequent lulls of motivation and persist in the face of adversity by managing the self, paying attention to common de-motivators and potential solutions. In Chapter Four, the book dwells on “dealing with your supervisor”. In the academia, for a research student, the supervisor is the alter ego. He/she is one of the most important people in life; at least it feels that way while you are doing your doctorate. Chapter Four therefore, discusses how to build a constructive relationship with your supervisor based on the multitude of different supervisory styles that exist including supervision-by-committee.

“Sidelines of a Doctorate” is the thematic thrust of Chapter Five. Doing a doctorate is not only about reading literature, choosing or designing a methodological approach, collecting and analyzing data and finally describing the process in a clear, logical
and concise prose in your thesis. Doing a doctorate degree also involves many additional tasks and activities, some of which are not even related to research. But because research does not exist in isolation and a doctorate is a learning process preparing you for a career in your chosen profession, your doctorate should be about more than “doing research”.

Chapter 5 therefore discusses some of the key elements that accompany the doctoral process, such as publications, conferences, teaching, networking, professional development and research exchanges. This is what the book refers to “sidelines of a doctorate”. “Finance” which is the theme of Chapter 6, is a serious consideration for postgraduate research students as a doctorate can be a lengthy, challenging, tasking and costly process. In this Chapter, the various ways students can fund their studies, including scholarships, bursaries, self-funding, research grants, teaching and part-time work are discussed.

Politics is a part and fact of life, so it is not surprising that universities are a political minefield. In Chapter Seven, the book introduces and work through some of the more sensitive issues students may encounter during their time by talking about departmental and university hierarchies, structures, groups and relationships and ways to avoid getting caught up in “messy” situations.

There are various ways of doing a doctorate. Chapter Eight covers some of the main challenges faced by individuals choosing alternative paths to doing a doctorate such as doctorate-by-publication students, part-time research degree candidates, overseas and international students, distance-learning postgraduates, and mature executives or professional doctorate students.

Doing a doctorate not only qualifies you for an academic and industry career. Chapter Nine discusses career paths and strategies – academic, industry, government, non-governmental
(NGO), hybrid and advice that one should decide early what career path(s) to choose. Chapter 10 entitled “Getting out: the viva and beyond” is the final chapter of the book. The book focuses on the concluding stages of the doctorate, discusses the all important “viva voice” (oral defence) in detail, talks about some of the issues surrounding early withdrawal from a doctorate programme, and describes how interactions and relationships with former colleagues, friends, and supervisors may look after you have finished your doctorate and left university.

Admittedly, there are other excellent books on Ph.D supervision and doing a Ph.D research or writing a doctoral thesis or dissertation as the case may be. But while these books are fixated on content and technical competences, such as choosing a topic, selecting suitable data collection techniques, and writing chapters, it actually leads to most of the books overlooking many of the ancillary and soft skills necessary to complete a doctorate. Simply put while other books offer technical skills and clinical advice on how to achieve the content of a doctorate, this book tells us about the process, the soft skills, and ancillary issues in doctorate degrees.

This book therefore is uniquely complementary. It offers fresh insight and perspective, something that has been missing in the marketplace so far. The book is also enriched with students’ case-study experiences. It is hugely recommended to doctorate students and their supervisors because it will help them survive the doctorate together and help create a fruitful working relationship from start to finish.
AUTHOR’S GUIDE

Authors are invited to submit manuscripts for review for possible publishing in the Sustainable Human Development Review, SHDR – an international multidisciplinary academic research journal (published quarterly: March, June, September, and December).

Manuscripts, which must be original, theoretical or empirical, and scholarly, are considered on the understanding that they are not submitted to any other publishers. Paper, with 1-inch all-round margin, must not exceed 8 pages 12-font-size Times New Roman single-line spacing in Microsoft Word (Windows ’97-2003), should be sent electronically as attachment to the Managing Editor, WIPRO International Academic Research Journals, through E-mail: info@wiprointernational.org (copy esccha@yahoo.com).

Paper should conform to Harvard style of citation and referencing. Citation in the text is by author's surname, year of publication and page where necessary, e.g. Moma (2008: 13) for in-sentence citation or (Moma, 2008:13); (Okolo and Adams, 2007); (Musa et al, 2003); (Mica, 1975 a and b), as appropriate, for end-sentence citation. Several citations by the same author should be arranged by date of publication. Full references should be listed alphabetically by author’s surname, followed by initials.

Under the title of the paper should appear the author’s name (surname first), institutional affiliation, rank, e-mail address and mobile phone number, followed by italicized abstract of not more than 100 words. Table or figure should be properly numbered (e.g. Table 1 or Fig. 1) and placed as close as possible to the in-text citation. Map, chart, table and figure should fit into trimmed quoato size.
Each submitted article should be accompanied by a review fee of $50 (international scholar), $30 (African scholar) or =N=3,500 (Nigerian scholar) paid into WIPRO International domiciliary US$ A/c. No. 1191023897 or Naira A/c. No. 1191034798 of ECOBANK Nigeria Plc., Enugu (Okpara Avenue Branch II). Scanned copy of payment teller should be sent electronically as attachment.

Minor and obvious corrections may be effected by the Editorial Board, but the Ms would be returned to author for major corrections. Authors will be communicated on the status of their articles within four weeks through their supplied e-mail addresses and/or phone numbers. After effecting major corrections, author will return Ms electronically as attachment for publishing in the next edition of SHDR with a pagination fee of $180 (international author), $150 (African author) or =N=12,000 (Nigerian author) plus Web metrics fee of $50 (international author), $30 (African author) or =N=3,000 (Nigerian author) paid as directed above with the scanned copy of payment teller sent as attachment. An article attracts a copy of the journal in which it appeared to the author(s), who will arrange to collect it from the Managing Editor in Enugu or pay the appropriate courier charge. An extra copy sells for =N=1,500 or $20.

For further inquiry
Contact: Managing Editor, Sustainable Human Development Review, Phone: +234-803-338-7472 or +234-805-315-2828; P.O. Box 9060, Enugu; E-mail: esccha@yahoo.com, onyenekenwa.eneh@unn.edu.ng, info@wiprointernational.org OR www.wiprointernational.org