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EDITORIAL NOTE

Five papers make up this issue. The first one, titled Environment and Islam by Savaş Alpay, İbrahim Özdemir and Dilek Demirbaş indicates that excessive consumption (and so production) and squandering are in the heart of the global environmental problems, and there is a strong need for the revival of the critical human values of moderation and thriftiness. Cumulative burden of individual irresponsibility can no longer be tolerated. Recent experiences demonstrate that any development model devoid of an ethical view on the environment, will be dominated by the uncontrolled exploitation of the natural assets with irreversible damages. Islam, as a religion of moderation, presents a viable alternative towards addressing the current challenges. Moderation refers not only to the personal lives of the believers but also to their interaction with fellow human beings and the nature they live in. Nature has been created in order, balance and with extraordinary esthetic beauty, and all these aspects of nature while enhancing man's life here, should be honored, utilized and protected accordingly. All patterns of man's production and consumption should be based on an overall order and balance of nature, which is a fundamental component of any meaningful approach towards a more environmentally friendly socio-economic development.

The second paper, titled The Cost of International Reserves: An Empirical Analysis from Malaysia by Siti Nurazira Mohd Daud and Abd Halim Ahmad specifically attempts to shed light on the cost of the joint decision to hold international reserves and external debt after the 1997 Asian financial crisis. The article's main findings are that holding international reserves does confer benefits on the country in terms of lower cost and improves the country's ability to protect itself from sudden shock. The results also suggest that Malaysia should hold international reserves of at least 4.96 months of imports, which is higher than the conventional rule of thumb. However, in its current international reserves position, Malaysia could finance 9.3 months of retained imports, which is too much and far above the optimal level.

The third paper, titled Deposit Behavior and Its Impact on Loan: A Case Study on Rajshahi Krishi Unnayan Bank (RAKUB), Bangladesh by Md. Belal Hossain, Md. Anowar Hossain Bhuiyan and Habibur Rahman, examines the deposit behavior of the bank. The study also analyses the impact of deposits on loan disbursement activities of RAKUB. The study is basically analytical and interpretative in nature considering the objectives of the study. A two-variable regression model has been adopted

to analyze and process the empirical data on deposits and loans of the study bank. The study reveals that there is a strong relationship between loans and deposits and the behavior of deposits affects lending a large extent. The value of the correlation coefficient indicates that the two variables, loans and deposits are highly positively correlated. The study shows that deposits are a major factor in bank fund management and it has a significant impact on loans and advances. Finally, RAKUB should cautiously maintain balance between loans and deposits for its survival in the competitive world of business.

The fourth paper, titled Causality between Government Expenditure and National Income: Evidence from Sudan by Ebaidalla Mahjoub Ebaidalla, aims to determine the nature and direction of causality between government expenditure and national income in Sudan using Granger causality test and Error Correction Model (ECM) for the period 1970-2008. The result of cointegration test shows a long-run relationship between government expenditure and national income in Sudan. The causality test indicates that the direction of causality running from government expenditure to national income, both in the short and long-run. Thus, the results support the Keynesian proposition, which states that public spending is an important exogenous factor for stimulating national income. Moreover, the study concludes that fiscal policy in Sudan plays a vital role in stabilizing the economy and achieving economic goals.

The last and fifth paper, titled The Challenges and Implications of Sustainable Development in Africa: Policy Options for Nigeria by Ogujiuba Kanayo, Ehigiamusoe Uyi Kizito and Udefuna Patrick, examines the challenges and implications of sustainable development in Africa with a special focus on Nigeria. Using descriptive and analytical approaches, the paper posits that the prominent challenges which hamper the achievement of sustainable development in Africa include; extreme poverty, rapid population growth rate, rapid urbanization, deforestation, environmental impact of extractive industries, rate of economic growth, rural development, climatic variability and natural environmental hazard. The paper considers the implications of these challenges on post 2015 agenda in Africa and suggests plausible policy options to address social, economic and environmental sustainability. Since it was discovered that inconsistency in government policies among others things have impacted adversely on the sustainability of Nigerian development, the paper furthermore recommends the establishment of the Sustainable Development Trust Fund (SDF) saddled with the responsibility of enforcing economic, social and environmental sustainability.

Environment and Islam

Savaş Alpay¹, İbrahim Özdemir² and Dilek Demirbaş³

For the last two hundred years, unprecedented environmental challenges and irreversible mass extinctions have been caused on the Earth including a rising trend in the global temperature during the 20th century. The loading capacity of the world has already been reached, and severe tensions between unending demands of the human beings and the finite natural resources of the world have become more apparent. The seemingly innocent and dulcet “laissez-faire” rhetoric in capitalist system promoted the removal of all meaningful checks and balances pertaining to production and consumption activities, and have resulted in the terrific destruction of our natural assets. Excessive consumption (and so production) and squandering are in the heart of the global environmental problems, and there is a strong need for the revival of the critical human values of moderation and thriftiness. Cumulative burden of individual irresponsibility can no longer be tolerated. Recent experiences demonstrate that any development model devoid of an ethical view on the environment, will be dominated by the uncontrolled exploitation of the natural assets with irreversible damages. Islam, as a religion of moderation, presents a viable alternative towards addressing the current challenges. Moderation refers not only to the personal lives of the believers but also to their interaction with fellow human beings and the nature they live in. Nature has been created in order, balance and with extraordinary esthetic beauty, and all these aspects of nature while enhancing man's life here, should be honored, utilized and protected accordingly. All patterns of man's production and consumption should be based on an overall order and balance of nature, which is a fundamental component of any meaningful approach towards a more environmentally friendly socio-economic development.

1. Introduction

For the last two hundred years, unprecedented environmental challenges and irreversible mass extinctions have been caused on the

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Earth including a rising trend in the global temperature during the 20th century. Considerable research findings by many scientists across the disciplines demonstrate that climate change is a reality and ‘very likely’ human-induced event. According to a recent report by the Intergovernmental Panel on Climate Change (IPCC), leading climate scientists now feel confident that human activity is heating up the planet since Industrial Revolution (IPCC, 2010). Consistent with this, emissions per head are highest in developed countries and much lower in developing countries—although developing countries are likely to be closing the gap, because of their more rapid collective growth and their increasing share of more energy-intensive industries (Hovi and Holtmark, 2006). Unfortunately, studies further suggest that those activities will more likely continue to affect climate adversely over the next century (Nordhaus, 2007). With this greatest damage, some estimates suggest that not only are more than one hundred species a day becoming extinct, but also our natural resources that sustain life on the planet—air, water and soil—are becoming polluted or depleted on an alarming scale together with exponentially increasing human population growth (Des Jardins, 2001). This means that as the prospects for reversing the continued degradation and depletion of natural resources plummet, natural resources on the planet such as clean water, clean air and clean soil will become a luxury, and resources for the survival of future generations will be scarce⁴. A comprehensive survey of the international environmental agreements and their practical impact on the environmental problems they target shows that there is no strong consensus by the countries to address the current challenges effectively (Alpay, 2002).

Climate change is one of the many different forms of the unprecedented degradation in our common environmental assets. According to Living Planet Report of the WWF 2012, since the 1970s, annual demand on the natural world by human beings has exceeded the annual Earth’s regenerative capacity, indicating an eventual depletion of our natural resources. The Ecological Footprint, which tracks humanity’s demands on the biosphere by comparing the renewable resources people are consuming against the Earth’s biocapacity, shows

⁴ Demirbaş, D. The Economics of Air Pollution: Theories, Valuation Methods and Policy Aspects,’ in *Air Pollution, Health and Environmental Impacts*, Edited by B. Gurjar, L. Molina and CSP Ojha, Taylor & Francis: USA, 2010.

a consistent trend of overconsumption. The WWF 2012 Living Planet Report indicates that “if all of humanity lived like an average resident of Indonesia, only two-thirds of the planet’s bio capacity would be used; if everyone lived like an average Argentinean, humanity would demand more than half an additional planet; and if everyone lived like an average resident of the USA, a total of four Earths would be required to regenerate humanity’s annual demand on nature”.

Air pollution is another very common form of major environmental problems, and poses significant health risks across countries. With the recent increases in air pollution levels (such as Carbon Monoxide, Ground-Level Ozone, Lead, Nitrogen Dioxide, Particulate Matter, Sulphur Dioxide), countries face significant burden of disease from respiratory infections, heart disease, and lung cancer. Indoor air pollution is estimated to cause approximately 2 million premature deaths mostly in developing countries. Almost half of these deaths are due to pneumonia in children under 5 years of age. Similarly urban outdoor air pollution is estimated to cause 1.3 million deaths worldwide per year. Those living in middle-income countries disproportionately experience this burden. It is worth noting that exposure to air pollutants is largely beyond the control of individuals, and requires action by public authorities at the national, regional and even international levels (WHO, 2011).

The prospects for our water resources, another significant component of our lives, are not promising either. Every day, 2 million tons of sewage and industrial and agricultural waste are discharged into the world’s water (UNESCO-WWAP, 2003), which can almost be matched to the weight equivalent of the entire human population of 6.8 billion people. According to the estimates of the studies undertaken by the United Nations, the amount of wastewater produced annually is about 1,500 cubic kilometer, six times more water than exists in all the rivers of the world.

It is surprising to note that given all the advancements in science and technology, 2.5 billion people worldwide live without improved sanitation (UNESCO-WWAP, 2012); over 70% of these people who lack sanitation live in Asia. In 2006, only 31% of residents in Sub-Saharan Africa, had access to improved sanitation, and this region is the slowest of the world’s regions in achieving improved sanitation.

Infectious diseases associated with waterborne diseases are the number one killer of children under five years old worldwide, and according to World Health Organization estimates more people die from unsafe water annually than from all forms of violence, including war. Unsafe or inadequate water, sanitation, and hygiene cause approximately 3.1 % of all deaths worldwide, and more strikingly, unsafe water causes 4 billion cases of diarrhoea each year, which results in 2.2 million deaths, mostly of children under five. In other words, of all the child deaths each year, 15% are attributable to diarrhoea, which painfully means a child dying every 15 seconds.⁵

Desertification, a form of soil pollution reflected by the degradation of dry land, is another commonly observed global environmental problem. According to a 2008 factsheet by the United Nations Convention to Combat Desertification, about 3.6 thousand million hectares of the world's dryland (70% of the total) had been degraded. The trend is not promising here and according to recent estimates, the world is experiencing continuous desertification across different regions, but in particular along the borders of semi-arid and arid lands in America (north and south), central Australia, Asia and Africa.⁶ Only in Africa, about 75% of the agriculture land has been degraded through desertification, which generated additional adverse effects on its already difficult economic circumstances.

Brazil is one of the shining emerging economies of the world and a member of the BRICS, a powerful economic bloc of recent times. Its name comes from a special tree that covers most of its coastal regions. As a reflection of the word for glowing embers, due to red colour of this tree, the colonizers called it Braisil (the official name of its current capital). In only one century, the Spanish and Portugese colonizers managed to destroy this beautiful natural asset and the tree had disappeared totally from the 100 km wide stretch that used to be its natural habitat.⁷ On its path to higher levels of economic development, will Brazil, and other developing countries in this context, copy the tragic environmental mistakes of Western modernity and exploit the natural resources, or will it be responsible and choose an

⁵ UNICEF, Progress of Nations, 2000.

⁶ Ritter, Michael E., *The Physical Environment: an Introduction to Physical Geography*, 2006.

⁷ Avicenna and the Ethics of Science and Technology Today, UNESCO publications, 2004, <http://www.unesco.org/shs/ethics>

environmentally friendly economic development? How can we make sure that the latter will be the preferred choice?

In this past century, not only the tree cover in Brazil was destroyed but also our waters are polluted, air quality significantly deteriorated with the resulting increase in painful respiratory diseases, and unreliable and unpredictable changes in our climate with sea level rises threatening many countries and devastating natural disasters across the world. The increasing adoption of capitalism by many countries, and the very principle of capitalism –ceaseless accumulation of capital and reckless accommodation of endless human demands- rings the bells for the global environment. It should also be emphasized that the loading capacity of the world has already been reached, and we are observing severe tensions between unending demands of the human beings and the finite natural resources of the world. Recent experiences demonstrate that any development model devoid of an ethical view on the environment, will be dominated by the uncontrolled exploitation of the natural assets with irreversible damages. The reversal of this dangerous tension between economic development and environment is very critical for the future survival of the humankind as it is obvious that the dominance of materialistic approaches are exacerbating the current problems.

2. Environment as a Common Value of Humanity

The modern worldview sees nature as a machine, that it has no value and expresses no sense of purpose⁸. In a nutshell, this view robs nature of all its inherent qualities. John Locke's theory of primary and secondary qualities may be interesting to note in this context. Locke argues that only primary qualities exist in nature; there is no place for secondary qualities. Rather, the latter are products of the human mind which are imposed on nature, which in itself is devoid of soul and intelligence and has no inherent or intrinsic values at all. In short, "nature is a dull affair, soundless, scentless, colorless: merely the hurrying of material, endlessly, meaninglessly."⁹ A tree, for example,

⁸ This section and the next one are mostly based on general findings of Özdemir (2003), *Towards an Understanding of Environmental Ethics from a Qur'anic Perspective*, in Islam and Ecology, edited by R. Foltz.

⁹ Locke's theory of primary and secondary qualities is best summarized by A.N. Whitehead, who realized the full implications of this theory, as follows: "The primary qualities are the

has no intrinsic value of its own being as such. According to the modern materialistic concept of nature, a tree gains its value through human intervention, such as when it becomes a chair, a table or whatever. The only value that nature can have is instrumental value. Such an understanding of nature has provided justification for the exploitative use of nature and natural resources.

According to Schumacher (1973), "The modern man does not experience himself as a part of nature but as an outside force destined to dominate and conquer it. He even talks of a battle with nature, forgetting that, if he won the battle he would find himself on the losing side. One reason overlooking this vital fact is that we are estranged from reality and inclined to treat as valueless everything that we have not made ourselves....[W]e forgot the fact that what we use to make some of the capital which today helps us to produce is a small part of the total capital we are using. Far larger is the capital provided by nature and not by man. This larger part is now being used up at an alarming rate."¹⁰

The main reason of why modern man does not experience himself as a part of nature but as an outside force destined to dominate and conquer it stems from the positivist ideological point of view. During the second half of the nineteenth century and the first half of the twentieth century, the predominant view held by the positivists and scientifically-minded philosophers was that science and technology could satisfy humanity and solve its problems totally. As a result of this view, modern man lost

essential qualities of substances whose spatio-temporal relationships constitute nature. The orderliness of these relationships constitutes the order of nature. But the mind in apprehending also experiences sensations which, properly speaking, are qualities of the mind alone. These sensations are projected by the mind so as to clothe appropriate bodies in external nature. Thus the bodies are perceived as with qualities which in reality do not belong to them, qualities which in fact are purely the offspring of the mind. Thus nature gets credit which should in truth be reserved for ourselves: the rose for its scent: the nightingale for his song: and the sun for his radiance. The poets are entirely mistaken. They should address their lyrics to themselves, and should turn them into odes of self-congratulation on the excellency of the human mind." See A. N. Whitehead, *Science and the Modern World* (New York: Macmillan Company, 1926), pp. 79-80. For a recent exposition and critique of the theory of qualities, see David Ray Griffin, *God and Religion in the Postmodern World: Essays in Postmodern Theology* (Albany: SUNY Press, 1989), pp. 16-17.

¹⁰ Schumacher, E. F. *Small is Beautiful*. England: Abakus, page 11.

his awareness of the sacred dimension of nature and alienated himself from it¹¹.

There have been many reasons for the loss of this awareness; and the one that is associated with the work of the science community has been the dominance of the neoclassical economic approach on the academic and scientific research. This school of thought, in pursuit of mirroring the approach of positive sciences, placed an undeserved weight on the application of positivism in the analysis of social phenomenon around us without giving any consideration over the differences between social sciences and positive sciences, where the application of positivism was naturally not a problematic issue for the latter. Normative approach may not be a part of positive sciences but it can not be left aside for social sciences. Current mainstream economics under the influence of neoclassical school of thought is not in a position to take a balanced and meaningful framework for the analysis of environmental issues.

The instrumental view of nature which characterizes modern thought has been very severely criticized by environmentalists in recent decades. Environmentalists claim that there is a strong and direct relationship between environmental problems and our modern understanding of nature. To put it more concretely, the value systems that we hold and which, in turn, shape and mold our behavior and attitudes towards society and nature, are the result of our overall beliefs and metaphysical views concerning all reality. Consequently, any alternative theories of environmental ethics need to be expected to challenge the basic propositions of the dominant modern understanding of nature. There is now an urgent need to fill what Hans Jonas calls an “ethical vacuum at the core of the contemporary modern culture.”¹²

The Qur'an, which Muslims consider to be the last of the chain of divine revelations, has been a source of inspiration, illumination and guidance for Muslim philosophers, theologians, scientists, jurists, and others who have accepted it as their sacred revelation. It can be said that the Qur'an is regarded by Muslims as a book of law, prayer, wisdom, worship, and

¹¹ Demirbaş, D. and Demirbaş, S. 'The Economics of Greenhouse Gas Emission and Climate Change' kitap adı: *Greenhouse Gas Emissions and Climate Change*, editorler: Dr. Bhola Gurjar (IIT, India) ASCE (American Society for Civil Engineers), 2011.

¹² Hans Jonas, *The Imperative of Responsibility* (Chicago: University of Chicago Press, 1984), p. 22.

invocation—in short, a unique and comprehensive sacred text that contains whatever pertains essentially to the human condition. For this reason, it is unanimously considered by insiders and outsiders alike to be the most fundamental basis both for the faith of the individual Muslim and for what is called Islamic civilization. Muslims naturally believe that the Qur'an continues to play such a role today in our quest for conducting a meaningfully ethical life. As is clear from the records of history, the Qur'an has played this role in the lives of Muslims from the very beginning of revelation, providing a comprehensive, integrated, and holistic worldview based on the unity of reality.

Looking at the earliest revelations in the Qur'an, which were revealed during the Meccan period, we see that the leading message in these verses is “to awaken in man the higher consciousness of his manifold relations with God and universe.”¹³ The impact of grasping the message of these verses is expected, first, to change his overall worldview, then to construct his image of himself, and finally, to change his attitudes, feelings, sentiments and the patterns of his relationships with reality accordingly. These important verses play a key role in understanding the overall Qur'anic worldview. The great Muslim philosopher and Sufi, Muhammad al-Ghazali, for example, in evaluating the meaning of the Qur'anic verses, argues that the early chapters are “the essence of the Qur'an, its heart, its pith, and its secret.”¹⁴ For Ghazali, it is these verses that show us the meaning of reality, and Ghazali clearly indicates the importance of trying to understand the deep meanings behind them.¹⁵ It is very interesting to note that these verses, on many occasions, attract the attention of the human beings to the wonderful structure and harmony in our outer environment, including all the creation, be it animals, plants or mountains or other non-living elements, and through them human beings are asked to understand and comprehend the belief in the Creator of all these wonders.

The Qur'an, with its emphasis on the metaphysical dimension of nature, replaced the pagan Arabs' conception of nature with a new and vivid understanding. It is surprising to see the striking similarity between the

¹³ Sir Mohammad Iqbal, *The Reconstruction of Religious Thought in Islam*, p. 8-9.

¹⁴ Al-Ghazali, Abu Hamid, *The Jewels of the Qur'an*, p. 25.

¹⁵ Ibid., p. 19-20. According to him, “the Qur'an is like an ocean. As at the bottom of the ocean, pearls remain hidden, so also are hidden the wonderful meanings behind the Qur'anic verses.”

Arabs' view of nature as lifeless, meaningless and purposeless and the ideas put forward in the name of the so-called "scientific" worldview of modern times. Today, the Qur'an is as ready as ever to challenge the modern materialistic conception of nature and to provide a more comprehensive and holistic approach to developing an environmental ethical theory. One of the most important Islamic principles related to the environment is the prohibition concerning thoughtless consumption; that is, wastefulness and extravagance. Wastefulness is not only the thoughtless consumption of natural resources; it is at the same time being disrespectful towards God, the Creator and the Owner of all the bounties. God says: "Verily We have created all things in proportion and measure" (Qur'an: 54:49). As a strong implication of this last verse, preserving the balance and measure is a human obligation. The science of ecology shows us that the universe contains extremely sensitive ecological systems and balances, and that man has to maintain these systems properly for its future survival. Islam permits utilization of the environment, but this should not be arbitrary, and in particular, should be free of wastefulness and extravagance:

O children of Adam! Wear your beautiful apparel at every time and place of prayer; eat and drink, but waste not by excess, for God loves not the wasters. (Qur'an, 7:31)

The eating and drinking in this verse refer to utilizing all the resources required for the continuation of our lives. This should not be uncontrolled. The elements that support life should be conserved so that they can be utilized continuously. More than this, such conservation and their proper utilization should be unselfish. The following commands of the Qur'an are striking at a time when there are significant inequalities associated with the current economic development models across almost all countries:

Give to the near of kin his due, and also to the needy and the wayfarer. Do not squander your wealth wastefully (Qur'an: 17-26).

(The true servants of the Merciful One are) those who are neither extravagant nor niggardly in their spending but keep the golden mean between the two (Qur'an, 25:67).

3. Fundamental Islamic Principles for the Environment

According to Islam, everything in the universe is created by God for a noble purpose and that in itself confers upon the natural environment a sacredness, which must be recognised by all believers. It is God Who adorns the skies with the sun, the moon and the stars, and the face of the earth with flowers, trees, gardens, orchards, and the various animal species. It is again God Who causes the rivers and streams to flow on the earth, Who upholds the skies (without support), causes the rain to fall, and places the boundary between night and day. The universe together with all its richness and vitality is the work and art of God. It is again God Who creates all plants and animals as pairs, in this way causing their procreation. Nature was created by God, and it belongs to God.

On many occasions the Qur'an emphasizes and re-emphasizes the ultimate principle that lies beyond nature, why nature exists and what it means. Nature is not there just by accident, as a result of the process of evolution or chaotic configurations without meaning or purpose; on the contrary, it has a perfect order and substantive meaning. Nature has been regarded as "the prime miracle" of God, cited untiringly in the Qur'an, with its well-knit structure and regularity.¹⁶ The Qur'an's insistence on the order, beauty and harmony of nature implies that there is no demarcation between what the Qur'an reveals and what nature manifests.

A very relevant principle in this context, and a critical reflection of the Qur'anic perspective for environmental ethics, is that nothing is created without a serious purpose. It is incompatible with the power of the All-Powerful and the mercy of the All-Merciful that He should create things without any meaning, purpose and use. In this regard, the following verses are assertive:

Behold! in the creation of the heavens and the earth and the alternation of night and day there are indeed Signs for men of understanding. Men who celebrate the praises of God standing, sitting and lying down on their sides and

¹⁶ Rahman, *Major Themes*, p. 68.

contemplate the (wonders of) creation in the heavens and the earth (with the thought): “Our Lord! You have created (all) this not for nothing!” (Qur’an 3:190-191)

One immediate conclusion, from an environmentalist perspective, is that every individual creature or being has its own ontological existence as a sign of God, and by its very being it is worth to give it its proper position in the universe, and use it in accordance with its purpose of creation and with due respect as it manifests and reveals signs of the Creator. Therefore, every creature deserves attention and consideration for its relation to the divine.

In Islam, God created human beings as vicegerents on the earth, and not as the lords of nature and the world. All believers must have the utmost care and respect towards nature. Islam permits utilization of the environment, but this should not be arbitrary. While utilizing the world’s bounties, Muslims should not do so with an unconstrained and irresponsible approach to consumption. On the contrary, they are obliged to utilize the natural resources provided to them with moderation and with the responsibility that they have as vicegerents of the All-Wise.

This brings a quite challenge against the materialistic world view, which puts human beings at the centre of the universe and treats all environmental assets as objects at their disposal for the realization of whatever ambitions they may have. Especially after the industrial revolution, mankind has consumed the world’s precious resources in an unprecedented manner. The strange thought of full domination over the nature has now put the human beings under the domination of the loss of critical natural assets. The human moral corruption linked to the dominance of materialistic attitudes has, through corruption of the earth’s spiritual ambiance, corrupted the earth’s blessings and therefore its physical environment as well (Muhammad et. al., 2010). God says in the Holy Qur’an:

‘Evil has become rife on the land and at sea because of men's deeds; this in order that He may cause them to have a taste of some of their deeds; perhaps they will turn back (from evil).’ (Al-Rum, 30:41)

Mankind's inward corruption is not only reflected in the world's outward corruption, it is its actual cause, both directly and physically (through man's pollution of the world and his upsetting the natural balance), and spiritually and existentially (as man's inner corruption changes the subtle existential conditions of the physical world, by 'solidifying' it and cutting it from the graces of heaven). This is the real reason why no amount of scientific environmental action can fully work without spiritual renewal within mankind, and why, conversely, spiritual renewal needs also environmental action to be successful. This is the point when moral transformation is needed and necessary for mankind to stop damaging environment. Human beings are after all only mere stewards, and not owners. Sovereignty, in metaphysical terms, is God's alone (... in Whose hands is the dominion of all things, 36:83). This moral transformation is hidden in Islamic thought and in its principles as the Holy Qur'an sets out complete spiritual and moral ecological guidelines for man (Muhammad et. al. 2010). The following verses underline the same point and once more emphasize the importance of balance in the Qur'anic discourse:

The sun and the moon follow courses (exactly) computed.

And the herbs and the trees-both (alike) bow in adoration.

And the Firmament has He raised high and He has set up the balance (of Justice). In order that you may not transgress (due) balance. So establish weight with justice and fall not short in the balance. (Qur'an 55:5-9)

The key term here is *balance*, which is repeated three times. It is evident from the above discussion that justice and balance are a universal law of God, and consequently, man should conduct a just and balanced life. They establish firstly that justice and balance are universal, secondly that this universal balance is created by God, and thirdly that man must both attempt to comprehend this universal balance and to follow it in all aspects of his life including his interaction with the environment. The Qur'an presents the fundamental views of Islam, and they are complemented and exemplified by the traditions, both sayings and

actions, of Prophet Muhammed (pbuh)¹⁷. In this connection, it will be important to reflect on a prophetic attitude which reflects the Qur'anic spirit very clearly and powerfully. Prophet Muhammed (pbuh) attached great importance to the moderate use of water,¹⁸ and forbade the excessive use of it even when taking the ablutions¹⁹, saying that to do so was reprehensible (*makruh*). He prevented people from using too much water even for something like ablutions when preparing to enter the divine presence for prayer:

God's Messenger appeared while Sa'd was taking the ablutions. When he saw that Sa'ad was using a lot of water, he intervened saying:

'What is this? You are wasting water.'

Sa'd replied asking: 'Can there be wastefulness while taking the ablutions?'

To which God's Messenger replied:

'Yes, even if you take them on the bank of a rushing river.'²⁰

While reflecting on this particular event and the attitude of the Prophet, this event is not only a simple instruction of using water responsibly while taking the ablutions, but also the articulation of an important and critical principle to be followed by Muslims in all of their affairs. The following points should be emphasized in this context:

- God's Messenger is stating an important prohibition.

¹⁷ Peace Be Upon Him.

¹⁸ As we know, the Qur'an regards water as the source of life and gives great importance to water as an essential and primary element of the ecosystem. With this emphasis it also draws our attention towards water: "And God has created every animal from water: of them there are some that creep on their bellies; some that walk on two legs; and some that walk on four. God creates what He wills: for verily God has power over all things" Qur'an 24:45; see also 25:54.

¹⁹ Preparatory cleaning of outer parts of the body (such as hands, face and feet) for the daily prayers.

²⁰ *Musnad*, ii, 22; *Ibn Maja*, "Tahara," 48, No: 425; i, 147.

- The prohibition concerns something for which no effort was exerted in obtaining it, nor money spent, but is free: the water of a flowing river.
- Moreover, the excessive use of water causes no deficiency to nature, nor does it cause pollution, nor spoil the ecological balance.
- It causes no harm to living beings.
- Furthermore, the matter in question, that is, taking the ablutions, is not some trivial matter; it is a necessary condition for the obligatory prayers.

If then, despite all the above, it is reprehensible to use excessive water from a river while taking the ablutions, and it was prohibited by the Prophet, how much stronger is the prohibition on being wasteful and extravagant in matters, in which none of the above statements are applicable? That is, if wastefulness

- is in something that requires the investment of time, money and/or effort;
- if it causes degradation of invaluable natural assets, thus spoiling the ecological balance or if it harms living beings;
- if it violates the rights of forthcoming generations to live in a healthy environment;
- if it is arbitrary and meaningless, and merely for enjoyment, that is, for the satisfaction of destructive side of man;²¹ then how much greater would be the degree of prohibition!

²¹ It might reasonably be argued that there are very good reasons for Islam prohibiting wastefulness and prodigality so forcefully. We may put it this way: there are over six billion people living in the world today. Just think of each individual person cutting down a tree or killing an animal just for the fun of it. Six billion trees or animals would perish. Or think of the water they would waste, or the bread or other foodstuffs they would throw away. The serious consequences of those apparently insignificant actions are clear. Moreover, for the greater part it is not possible to reclaim the resources we have polluted, destroyed, or annihilated. It is in this light that we may understand how meaningful was the point emphasized by God's Messenger when he said: "Even if you take the ablutions in a flowing river, do not waste the water," and how important it is for the preservation of the ecological balance.

It will be very striking to consider the implications of such a simple but significant principle in light of the following statistics on global food waste. A recent study²², carried out by the *Swedish Institute for Food and Biotechnology*, shows that

- Globally, one-third of the food produced for human consumption is lost, about 1.3 billion tons;
- Per capita waste by consumers is between 95-115 kg a year in Europe and North America, while consumers in sub-Saharan Africa and South and Southeast Asia each throw away only 6-11 kg a year (it is estimated that the amount of food wasted in the US per year would feed the US population for about 44 to 54 days);
- Counter-intuitively, industrialized and developing countries actually waste about the same amount of food (670 and 630 million tons, respectively).
- Every year, consumers in high-income countries waste almost as much food (222 million tonnes) as the entire net food production of sub-Saharan Africa (230 million tonnes).
- The amount of food lost or wasted every year is equivalent to more than half of the world's annual cereals crop (2.3 billion tonnes in 2009/2010).
- Food losses — occurring at the production, harvest, post-harvest and processing phases — are most important in developing countries, due to poor infrastructure, low levels of technology and low investment in the food production systems; and food waste is more a problem in industrialized countries, most often caused by both retailers and consumers throwing perfectly edible foodstuffs into the trash.

These statistics when considered in light of the significant threats to our most valuable natural assets clearly demonstrate that humankind has lost

²² *The Global Food Losses and Food Waste*, commissioned by the Food and Agriculture Organization .

the checks and balances in its current production and consumption activities. The seemingly innocent and dulcet “laissez-faire” rhetoric in capitalist system promoted the removal of all meaningful checks and balances pertaining to production and consumption activities, and have resulted in the terrific destruction of our natural assets. As clearly seen in above statistics, excessive consumption (and so production) and squandering are in the heart of the global environmental problems, and there is a strong need for the revival of the critical human values of moderation and thriftiness. Cumulative burden of individual irresponsibility can no longer be tolerated. A native American indian proverb is worth to remember in this context: “When all the trees have been cut down, when all the animals have been hunted, when all the waters are polluted, when all the air is unsafe to breathe, only then will you discover you cannot eat money.”

4. Role of Islam in Promoting a More Environmentally Friendly Future

Islam is a religion of moderation; moderation refers not only to the personal lives of the believers but also to their interaction with fellow human beings and the nature they live in. Although, by being the vicegerents of God, human beings are in a very special and unique position, this does not warrant them to live merely as they wish, and on the contrary, they are expected to lead a purposeful and caring life. Muslims need to surrender themselves to the law of God, as evident in nature and in the Qur'an. Izzetbegovic (1994) rightly underlines the fact that “a Muslim, due to the balance of physical and moral requirements, will be in better harmony with his surroundings than any other type of man,”²³ on the condition that he lives his life in accordance with the Qur'anic principles as reflected in the life of Prophet Muhammad (pbuh) (Goulet, 1980).²⁴ The Qur'an goes further, and calls all nature *muslim* (“submissive”). The only difference between nature and man is that

²³ Alija Ali Izzetbegovic, *Islam Between East and West* (Ankara, 1994), p.226.

²⁴ Goulet emphasizes this point as follows: “High indices of suicide in ‘developed’ countries have often blinded observers to the truth that material sufficiency, or abundance, may be less essential - even for survival - than is the presence of meaning. In order to survive one must want to survive, but how can one want to survive unless life has a meaning? Accordingly, having a meaningful existence may well be the most basic of all human needs.” Denis Goulet, “Development Experts: The One-Eyed Giants,” *World Development* 8 (1980), pp. 481-89.

nature is *muslim* without free will, implying that only man can be Muslim by his own free choice.

A careful analysis of the history of Islam, especially the history of Qur'anic exegesis, from an environmental perspective, will reveal that "although the various components of the natural environment serve humanity as one of their functions, this does not imply that human use is the sole reason for their creation" (Deen, 1990)²⁵. Both classical and contemporary Muslim scholars have interesting views on this matter. For example, al-Biruni, one of the most learned Muslim scholars and compilers of the tenth century, argues that "man does not have a right to exploit the other kingdoms for his own desires, which are insatiable, but may use them only in conformity with the law of God and in His way."²⁶

A fundamental principle of Islam is that nothing is created without a purpose, and all creation have to be respected and not be harmed without any sound reason. Islam rejects the idea that the nature (or any other creation in this context), is an object at the full disposal of humankind for the realization of their desires. Nature has been entrusted to mankind, as they are God's vicegerents on earth. Human beings are not the lords of nature and the world, however; nothing is at their disposal to be used haphazardly and irresponsibly. What is important in the Qur'anic context is that human beings are responsible and accountable for their actions here on earth. This means that they are answerable for all that they do, both the good and the evil. As God's vicegerents, on the Day of Judgement, they will be called to account for all actions in fulfilling this trust: "Whoever does an atom's weight of good shall see it, And whoever does an atom's weight of evil, shall see it" (Qur'an, 99:7-8). Similarly, "So glory to Him in whose hands is the dominion of all things: And to Him will you be all brought back" (Qur'an 36:83). According to Yusuf Ali, the message conveyed in this

²⁵ Mawil Y. Izzi Deen (Samarrai), "Islamic Environmental Ethics, Law, and Society," in *Ethics of Environment and Development. Global Challenge, International Response*, ed. J. Ronald Engel and Joan Gibb Engel (London: Belhaver Press, 1990), p. 189.

²⁶ Nasr, *Introduction to Islamic Cosmological Doctrines*. Nasr provides valuable information about al-Biruni: "Al-Biruni represents the point of view of the scholar and compiler as well as that of the mathematician and astronomer. As a very competent scientist, historian, and general observer and commentator on the civilizations of mankind, *he approaches the study of Nature as a devout Muslim who sees the world as the handiwork of God and considers the observation and study of Nature as a religious duty*" (Ibid., 275-276, italics added.).

last verse is the core of revelation; it is all about the hereafter. All things were created by God, are maintained by Him, and will go back to Him. But the point of special interest to man is that he will also be brought back to God and is answerable to Him, and to Him alone.²⁷ In short, although man has been given a special place and rank in the hierarchy of creation, “man is invited to use the opportunity for good and not to corrupt the earth.”²⁸ This Qur’anic worldview is first observed and exemplified in life of the prophet Muhammad (pbuh); as his life is regarded by Muslims as the living Qur’an this had a powerful exemplary effect on Muslims throughout the ages. Being imbued with the Prophet’s attitudes, Muslims have looked on nature compassionately and with tolerance. Today, all these values are awaiting rediscovery and adoption, so that the devastating environmental problems and challenges of our age can be addressed in a timely and effective manner.

In brief, Islam provides a safe haven for the environment through the following principles, as indicated in its fundamental sources, the Qur’an and the traditions of the Prophet:

- The natural world has an ontological and objective existence as has been created by God, and which reflects His Divine Names and Attributes.
- Nature as a whole, being created and sustained by God, has intrinsic and inherent value, independent of its usefulness for human beings.
- Human beings, though being at the top of creation, are only members of all creation in this universe like nature. They have responsibilities towards all other creation (including the environment they live in), just as they have responsibilities towards their families.
- Human beings are the vicegerents of God on earth, and therefore they will be judged in the hereafter for their actions here. They will be held accountable for their actions related to the environment as well.

²⁷ Yusuf Ali, translator, *The Holy Qur’an* (Maryland: Amana, 1983), 1188.

²⁸ Rahman, *Major Themes*, 79. Qur’an 30:41: “Mischief [corruption] has appeared on land and sea because of (the deed) that hands of men have earned” and the very idea of corruption repeated in the Qur’an on many occasions.

- Biodiversity and the richness of the ecosystem is a result of God's creation and His Will, therefore it should be respected and maintained.

- Nature has been created in order, balance and with extraordinary esthetic beauty, and all these aspects of nature while enhancing man's life here, should be honored, utilized and protected accordingly.

- All patterns of man's production and consumption should be based on an overall order and balance of nature. The rights of man are not absolute and unlimited. We cannot consume and pollute nature as we wish. Excessive consumption, extravagance and squandering are all disliked and not permitted.

- Prevention of corruption on earth in general, and prevention of the appearance and emergence of corruption in ecosystems in particular, are considered to be among the primary responsibilities of all believers.

The Qur'an changed the hearts and minds of its followers when it dawned on the Arabian Peninsula, enriching man and providing a vivid lens through which he could establish a functional and prudent interaction with the nature and everything else around him. Today, at the dawn of the twenty-first century and in a time of world-wide environmental crisis, it again can play such a critical role, and offer human beings a fresh perspective as well as a comprehensive and competent approach to the nature towards addressing the global environmental problems. The relationship that the Qur'an enjoins between humans and non-humans is stated very eloquently and succinctly by Yunus Emre, a Sufi poet of the thirteenth century: "We love all creation for the sake of its Creator"!

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The Cost of International Reserves: An Empirical Analysis from Malaysia

Siti Nurazira Mohd Daud* and Abd Halim Ahmad**

Studies on the accumulation of international reserves by most of the crisis-hit countries have progressively gained in importance and continue to attract discussion among academics and policy-makers. Furthermore, the unprecedented increase of international reserves among the Asian crisis-hit countries (due to Asian Financial Crisis 1997/98) including Malaysia and the lack of studies on this topic underline the urgency of analyzing this issue. Thus, this paper specifically attempts to shed light on the cost of the joint decision to hold international reserves and external debt after the 1997 Asian financial crisis. The article's main findings are that holding international reserves does confer benefits on the country in terms of lower cost and improves the country's ability to protect itself from sudden shock. The results also suggest that Malaysia should hold international reserves of at least 4.96 months of imports, which is higher than the conventional rule of thumb. However, in its current international reserves position, Malaysia could finance 9.3 months of retained imports, which is too much and far above the optimal level.

1. Introduction

The financial crisis experienced by East Asian and Latin American countries in the late 1990s has resulted in a new approach to macroeconomic policy and has led to calls for reform of the international financial architecture. In addition, the newly formulated policy aims to reduce vulnerability to external shocks and lower the likelihood of external crises by maintaining public and external debt at manageable levels as well as accumulating international reserves as a self-insurance mechanism (Edwards, 2007).¹ It has been rationalized

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¹ International reserves are defined as the external assets that are readily available to and controlled by monetary authorities for meeting balance of payments financing needs, for intervention in exchange markets

that greater financial integration could lead to an increase in international reserves with the aim of reducing the incidence of costly output decline as induced by sudden reversal of capital flows, as well as speculative attack (Cheung and Qian, 2009; Aizenman, 2008; Rodrik, 2006; Mendoza, 2004). Countries with higher levels of liquid assets are better able to withstand panic induced by sudden shock in the capital market (Rodrik, 2006). However, Aizenman (2008) suggests that the international reserves are also subject to serious limitations such as macro and micro moral hazard and fiscal cost. Furthermore, in the era of financial globalization, where financial markets are integrated, countries face high exposure to international financial market vulnerability. As a result, the significant increase in international reserves accumulated by the crisis-hit countries has been interpreted as a self-insurance motive in anticipation of uncertainty in the economy.² In addition, developing countries cannot depend solely on the International Monetary Fund to protect them from sudden crises (Feldstein, 1999).³

On the other hand, the stock of external indebtedness continues to increase with the aim of supporting the domestic economy. The dual-gap theory, which explains the savings gap and foreign exchange gap and is an extension of the Harrod-Domar growth model, has highlighted the motivation behind the introduction of external debt to the growth model. If external debt has been efficiently allocated to domestic investment it could, in return, generate economic growth in the long run. Table 1 shows the average growth of reserves and external debt indicator. The upper panel presents the average growth of total international reserves and total external debt in United States dollars (millions). Meanwhile, the lower panel shows the average growth of international reserves and external debt ratio variables. In level form, it shows that during the period from 1991 to 2009, both international reserves and external debt have recorded a double-digit growth except for external debt over the period of 2001 to 2009. Despite the positive

to affect the currency exchange rate, and for other related purposes such as maintaining confidence in the currency and the economy, and serving as a basis for foreign borrowing (IMF, 1993).

² Aizenman and Lee (2005) find a strong positive correlation between the international reserves holding and past balance of payment crises.

³ However, holding high level of international reserves would also be associated with a cost. By holding too much of international reserves a country could possibly lose the opportunities and yield from other investment or portfolio diversification. In addition, an accumulation in reserves would lead to unbalanced economic growth from the global context.

growth recorded for international reserves and external debt-holding, the total external debt grows in a decreasing pattern with an average of 1.75 percent growth over the period of 2001 to 2009. Intuitively, it is notable that Malaysia continues to increase the total international reserves at a higher rate than the total external debt, which in turn raises issues related to the cost of holding reserves. This explains the reason for the growth recorded by the international reserves to external debt variable for the 2001-2009 of 9.847 percent. Meanwhile, the ratio variable of international reserves shows the highest growth for the period 2001-2009 as compared to the previous recorded year. Furthermore, the total external debt as a percentage of GNI shows a declining growth of 2.99 percent for the period 2001 to 2009. This has led to the question of whether holding more reserves could bring an additional advantage to the country.⁴ As at the end of 29 April 2011, Malaysia was holding international reserves amounting to RM393.2 billion (equivalent to USD130 billion) and this is sufficient to finance 9.3 months of retained imports (Central Bank of Malaysia, 2011).⁵ Meanwhile, Malaysia also has also shown a remarkably increasing pattern of total outstanding external debt which amounted to RM233.4 billion or USD77.1 billion as at the end of March 2011 (end Dec 2010: RM227.1 billion or USD72.8 billion), equivalent to 29% of GNI (Central Bank of Malaysia, 2011). As shown in Figure 1, there has been a tremendous increase in international reserves starting from the period of financial crisis; this could possibly relate to the self-insurance motive.

All the above developments highlight the need to formulate a strategy on the joint decision of holding international reserves and sovereign indebtedness, since sovereign debt also plays an income-smoothing role in the economy. While holding too many international reserves would burden the country with opportunity costs, a country with too few reserves could face a high risk of economic downturn. Therefore, the issue of adequate levels of international reserves-holding with a level of sovereign debt could also be raised.⁶ However, by accumulating

⁴ Despite the accumulation of international reserves to protect a country from a sudden shock, Rodrik (2006) questions why countries have not reduced the external exposure.

⁵ The ratio of reserves to retained imports or reserves in months of imports is one of the indicators of reserves adequacy and it measures the number of months a country can continue to support its current level of imports if all other inflows and outflows cease (IMF, 2000).

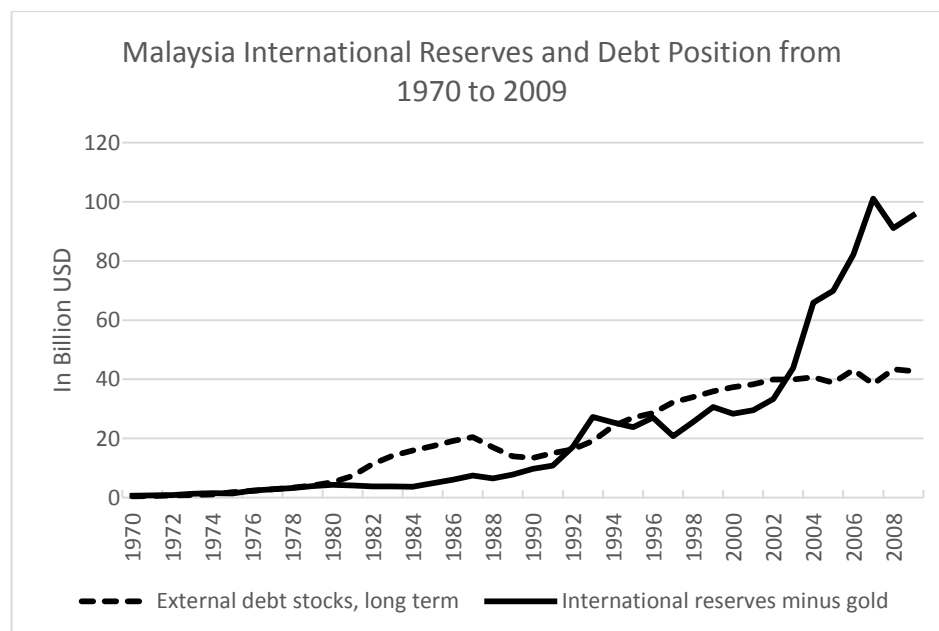
⁶ The rule of thumb to maintain reserves equivalent to three months of imports has become obsolete and needs to be revised due to high capital mobility in the emerging economies (Wijnholds and Kapteyn, 2001).

international reserves and external debt, a country could potentially default (with a high level of indebtedness). Conversely, by delaying the default, a country with a high level of debt is reducing welfare levels and, to a lesser extent, its sustainable debt position (Grossman and Han, 1997). These issues are important for policy formulation since they are related to a country's future access to the credit market. While a fair amount of empirical and theoretical literature has attempted to explain the motives of a country holding international reserves, none of the previous studies has provided an explanation of the cost of Malaysia's decision to jointly hold international reserves and external debt. Thus, the purpose of the present study is to analyze the cost of Malaysia's decision to jointly hold international reserves and sovereign indebtedness after the 1997 financial crisis. Furthermore, the paper has been motivated to investigate the optimal level of reserves-holding with a country's stock of sovereign indebtedness. This paper provides additional evidence and fills the gap in the literature by exploiting various techniques of estimation. Moreover, this paper could provide information about whether Malaysia is saving enough of her international reserves assets with regard to the stock of sovereign debt liability. In the next section, this paper reviews the existing theoretical and empirical literature. Then, the data and methodological consideration are described. The results estimation is discussed in the following section and the final section concludes the paper.

Table 1: The growth rate of the international reserves and external debt holding for Malaysia

	1970-2009	1970-1980	1981-1990	1991-2000	2001-2009
	Average growth (in percentages)				
Total international reserves	15.50	23.96	9.45	10.94	15.60
Total external debt	13.67	28.90	11.91	14.07	1.75
	Average growth (in percentages)				
International reserves/imports	3.59	1.60	-0.04	3.44	10.00
International reserves/external debt	2.70	-1.80	1.14	2.351	9.847
External debt/GNI	4.410	10.98	5.29	3.64	-2.99

Source: Authors' calculation, WDI/GDF, World Bank.

Figure 1: The pattern of international reserves and debt position from 1970 to 2009

Source: WDI/GDF, World Bank

2. Review of the Literature

There has been a surge of interest in examining the demand for international reserves. The first approach considers the element of adequacy; Triffin (1947) developed a theory that argued that the increase in demand for reserves would vary over time with the growth in world trade, specifically transactions in the current account position. In addition, by applying a monetarist balance of payment theory, Johnson (1958) points out that the international reserves-holding also depends on the country's money supply. Furthermore, if domestic money supply grows at a lower rate than the domestic demand, then a country will accumulate reserves.

On the other hand, Heller (1966) conceptualizes the idea of reserves demand as an inventory control problem. The optimization approach is utilized to analyze the demand for international reserves based on a cost-and-benefit analysis. Heller (1966) finds that the propensity to import, the opportunity cost of holding international reserves and the stability of a country's balance of payments account are all associated with a country's decision to hold international reserves. An increase in the propensity to import and the cost of holding international reserves will decrease the level of optimal reserves, while imbalances in the balance of payments position will tend to increase the international reserves-holding. Furthermore, the optimal level of international reserves-holding is given by the amount which minimizes the total cost of adjusting and financing the external imbalances. Meanwhile, Pagan (1968) reformulates the model proposed by Heller (1966) by adapting the inventory theory. Frenkel and Jovanovic (1981) develop a stochastic model to determine the optimal stock of international reserves and emphasize the important role of stochastic characteristics of external transaction and the forgone earnings with regard to holding reserves.

Despite the growing interest in analyzing the determinants of demand for reserves, Iyoha (1976), Hipple (1979), Ben-Bassat and Gottlieb (1992) and Ramachandran (2004) shed light on investigating the opportunity cost of holding reserves. The opportunity cost of holding reserves plays a role in models of optimal demand for foreign exchange. However, most studies have failed to find a significant opportunity cost effect. Iyoha (1976) estimates the opportunity costs of a cross-section of 29 Least Developed Countries (LDC) in 1970 and finds that a 10 percent

increase in the opportunity cost of holding reserves will trigger a 9 percent reduction in the level of reserves held. However, Hipple (1979) argues that the definition and proxy used by Iyoha (1976) is not suitable for representing the opportunity cost and suggests yield rates in the United States or United Kingdom. In another argument, Ben-Bassat and Gottlieb (1992) find a significant effect of opportunity cost on the demand for reserves by using the return on capital and reserves as a proxy. Ramachandran (2004) finds that the opportunity costs predominantly determine the reserve demand rather than the reserve volatilities.

On the empirical front, there is still a lack of empirical evidence analyzing the joint cost of holding reserves. The first empirical analysis to investigate the joint cost of holding reserves and debt was conducted by Yeyati (2008). The argument put forward by Yeyati (2008) suggests that self-insurance is costly and should be considered a second-best solution in the context of an imperfect international financial market. Yeyati (2008) also argues that the results should be refined by taking into account other potential factors such as country-specific effect characteristics despite highlighting that the results are possibly overstated. Meanwhile, in the case of developing countries, Daud and Podivinsky (2011) found that the positive effect of accumulating reserves which aims to improve sovereign ratings has been crowded-out by the negative effect of accumulating external debt which resulted in a net negative effect. The analysis also suggested that countries should reduce their sovereign debt in order to maintain a good credit risk position while holding international reserves at the optimal level of 3.67 in a month of imports.

3. Methodology and Data

The methodology adopts the simple model of Yeyati (2006, 2008) who analyzes the impact of the decision to jointly hold international reserves and sovereign debt on sovereign spread. This paper examines the following basic model given by

$$SSP_t = \alpha + \alpha_1 RESV_{t-1} + \alpha_2 EDEBT_{t-1} + \alpha_3 REER_t + \varepsilon_t \quad (1)$$

where (for country i , at time t), SSP is sovereign spread as a proxy of the opportunity cost, RESV is international reserves, EDEBT is sovereign debt and REER is real exchange rate. To examine the opportunity cost of holding reserves for the emerging markets, following Gonzalez-Rozada and Yeyati (2008), the Emerging Market Bond Index by JP Morgan (EMBI) is used as the dependent variable.⁷

This paper has been inspired by the work of Gonzalez-Rozada and Yeyati (2005) to use Emerging Market Bond Index (EMBI) as the dependent variable to represent the opportunity cost of holding reserves for the emerging markets. The opportunity cost of reserves could be explained as the difference between cost and benefits incurred or yielded by the government. Yeyati (2006) defines the opportunity cost as the return that the government has to pay in excess of the return on the liquid foreign assets to finance the purchase of reserves. In addition, Rodrik (2006) and Jeanne and Ranciere (2008) postulate opportunity cost of reserves as the difference between the interest rate paid on the country's liabilities and the lower return received on the reserves. An increase in international reserves reduces the probability of costly crises in the case of default and also reduces the spread paid on the stock of sovereign debt, which tends to reduce the marginal cost of reserves accumulation. The opportunity cost of self-insurance could also relate to a risk premium rate, while the risk premium also explains the probability of a country defaulting. Therefore, Jeanne and Ranciere (2008) suggest that the cost of self-insurance be measured by the pure risk premium (interest rate spread) rather than incorporating the default risk premium in the model since adding both risks could overestimate the true opportunity costs of reserves. To examine whether a linear cointegrating relationship exists for the estimated equation, the Autoregressive Distributed Lag (ARDL) bounds test developed by Pesaran et al. (2001) is utilized. As the sample size in this paper is relatively small, the Pesaran et al. (2001) bounds test procedure will be an appropriate technique (Pattichis 1999, Mah 2000, Tang and Nair 2002). Basically, the bounds test developed by Pesaran et al. (2001) is the Wald test (F-

⁷ EMBI Global is an emerging market debt benchmark index to measure the total return performance of international government bonds issued by emerging market countries that are considered sovereign (issued in something other than local currency) and that meet specific liquidity and structural requirements. In addition, EMBI Global identifies emerging markets countries with a combination of World Bank-defined per capita income brackets and each country's debt-restructuring history.

statistic version of the bound testing approaches) for the lagged level variables in the right-hand side of an Unrestricted Error Correction Model (UECM). The asymptotic distribution of the F-statistic is non-standard under the null hypothesis of no cointegrating relationship between the examined variables, irrespective of whether the explanatory variables are purely I(0) or I(1).

Under the conventionally used levels of significance such as 10 percent, 5 percent and 1 percent, if the statistic from a Wald test falls outside the critical bounds value (lower and upper values) a conclusive inference can be made without considering the order of integration of the explanatory variables. If the F-statistic exceeds the upper critical bound, the null hypothesis of no cointegrating relationship can be rejected. However, if the test statistic (F-statistic) falls below the lower critical bound, then the null of non-cointegration cannot be rejected. If the F-statistic falls between the upper and lower bounds, a conclusive inference cannot be made. The second stage of the ARDL approach is to estimate the coefficients of the long-run cointegrating relationship and the corresponding error correction model.

To enhance the credence of the analysis, this paper also employs the test proposed by Hansen (2000) to estimate the existence of non-linearity on the cost of reserves-holding as well as the optimal amount of international reserves-holding with respect to its opportunity cost. With a slight modification of Hansen (2000), this paper proceeds with the thresholds model of

$$SSP_t = \beta_1' x_t + \mu_t \quad q_t \leq \gamma \quad (3)$$

$$SSP_t = \beta_2' x_t + \mu_{ti} \quad q_t > \gamma \quad (4)$$

where q_t is the threshold variable, signifies for RESV variable. In addition, the threshold variable could be part of the regressors and it is used to split the sample into two regimes. Meanwhile SSP_t is the opportunity cost measured by EMBI and X is $p \times 1$ vector of independent variables and μ_t is a regression error. Models (3) and (4) can be written in a single equation form as

$$SSP_t = \beta'x_t + \theta x_t(\gamma) + \mu_t \quad (5)$$

where $d_t = I(q_t \leq \gamma)$. $I(\cdot)$ denotes the indicator function and sets the variable $x_t(\gamma) = x_t d_t(\gamma)$. Furthermore, the null hypothesis of linearity against a threshold specification can be expressed as:

$$H_0 : \beta_1 = \beta_2 \quad (6)$$

Equation (5) allows all the regression parameters to differ between the two regimes depending on the value of q_t . The threshold model developed by the Hansen (2000) estimator considered the least squares estimations test of the null of linearity against the alternative of a threshold. In addition, by providing an asymptotic simulation this method also computed a confidence interval by inverting the likelihood ratio statistics. Hansen (2000) also proposes an F-test bootstrap (heteroscedasticity-consistent) procedure to test the null of linearity. Since the threshold value γ is not identified under the null, the p-values are computed by a fixed bootstrap method. The independent variables are supposed to be fixed and the dependent variable is generated by a bootstrap from distribution $N(0, \hat{\mu}_i)$, where $\hat{\mu}_i$ is the OLS residual from the estimated thresholds model. Hansen (2000) shows that this procedure yields asymptotically correct p-values. If the null hypothesis of linearity is rejected, one can split up the original sample according to the estimated thresholds value and perform the same analysis on each subsample. The distribution of the threshold estimator is non-standard while it only allows one threshold relationship and one threshold variable.

Data are collected from various sources for the period of 2002Q1 to 2010Q4 from World Development Indicator (WDI) and Global Development Financial (GDF) indicator by the World Bank (WB) database, International Financial Statistics (IMF/IFS) by the International Monetary Fund (IMF) and Datastream by Thomson. The international reserves variables, external debt, GDP and real exchange rate are gathered from IMF/IFS and GDF databases. In addition, data on spread represented by the Global Emerging Market Bond Index (EMBI) are taken from Datastream as a proxy of opportunity cost. Data on

sovereign debt as a percentage of GDP which represents the sovereign debt are gathered from GDF/World Bank database.

4. Empirical Findings

Table 2 presents the results estimated by Ordinary Least Squares (OLS) on the cost of holding international reserves function. The results show that EDEBT, RESV and REER variables are significant at 5 percent significance level in explaining the sovereign spread for Malaysia. As presented in Model 2 which incorporates a risk factor, an increase of 1 percent of RESV reduces the sovereign spread for about 0.46 percent, while a 1 percent increase in EDEBT is associated with an increase of about 0.24 percent in sovereign spread. As a result, with the increase in international reserves and sovereign debt, the cost of holding reserves is lower than the cost of holding debt. From another point of view, if a country reduces the international reserves-holding, the cost would incurred about 0.46 percent, whereas by reducing the external debt by 1 percent, the cost is only reduced by 0.24 percent. This indicates that holding reserves is a better option than reducing the external debt.

Table 2: The ordinary least squares estimation of cost of holding reserves

Sovereign spread	Model 1 SSP(ED, RESV)	Model 2 SSP(ED, RESV, REER)
EDEBT	0.564 (0.052)*	0.2416 (0.099)*
RESV	-0.968 (0.046)*	-0.464 (0.048)*
REER	-	-0.833 (0.0875)*
Intercept	9.561 (0.412)*	17.398 (1.006)*
<i>R-Squared</i>	0.921	0.973

Notes: * and ** denotes significant at 5 and 10 percent significance level. Numbers in brackets represent the standard error. All variables are expressed in natural logarithms.

This paper proceeds to establish the long-run linear relationship between the variables and the sovereign spread. The results of the F-statistic for testing the long-run relationship between EDEBT, RESV, REER and sovereign spread are shown in Table 3. With a maximum number lag of 4 imposed, the computed F-statistic's values of 0.867 and 0.276 could not exceed the critical bounds of 3.793 to 4.855 and 3.219 to 4.378 at the 5 percent significance level for Model 1 and Model 2 respectively. This implies that the null hypothesis of no cointegrating long-run relationship could not be rejected. In addition, the computed F-statistics were also compared with the critical values provided by Narayan (2004, 2005).⁸ The results also fail to find evidence of a linear long-run relationship between the EDEBT, RESV, REER and sovereign spread for the period 2002Q1 to 2010Q4.

Since no evidence has been found to confirm the existence of a long-run linear relationship in the estimated cost function, this paper continues the analysis by employing a non-linearity test of Hansen (2000). Table 4 shows the results of the non-linearity test on the threshold estimates of the cost of international reserves-holding function with respect to its sovereign spread.⁹ By using 10,000 bootstrap replications, the F-statistics and the bootstrap p-values suggest a rejection of the null of no thresholds effect (at 5 percent significance level), suggesting evidence of the non-linearity relationship for Model 1 and Model 2. In addition, the results also reveal the intervals which propose a minimum and maximum level of international reserves assets that a country should hold. The results shows that, in Model 1, where the estimation is only taking into account the international reserves and sovereign debt, the interval of international reserves-holding ranges from 4.736 to 4.832 by months of imports. Meanwhile, taking into consideration the REER variable, the interval of international reserves-holding is around 4.687 to 4.956 months of imports. As the threshold variable represented by the international reserves as a month of imports, it provides information on the optimal level of international reserves with respect to the sovereign spread. The international reserves and sovereign debt are found to have

⁸ Based on the analysis by Narayan (2004) the existing critical value reported in Pesaran et al. (2001) is not suitable for use in small sample sizes. Furthermore, Narayan (2004) provides a set of critical values, specifically for small sample sizes ranging from 30 to 80 observations.

⁹ Traditional "rules of thumb" that have been used to guide reserve adequacy suggest that countries should hold reserves covering or the equivalent of 3 months of retained imports. However, this traditional measure of reserve adequacy appears to have limited relevance today with the notion of no one size fits all.

a significant impact on the sovereign spread (at 5 percent significance level) for both models.

The threshold estimates are found to account for about 4.83 and 4.96 for Models 1 and 2 respectively. In Model 1, which only incorporates the international reserves and sovereign debt as the independent variables, the optimal level of international reserves is found to account for about 4.83 months of imports, implying that a country should hold international reserves at 4.83 months of imports to protect itself from sudden shock. However, with a consideration of additional variable real exchange rate, the results indicated a slightly higher level of 4.96 months of imports as optimal reserves-holding. In the era of financial liberalization, where countries are highly exposed to risk of shocks, a model for the cost of holding reserves that includes other risk factors would provide a better prediction of the optimal level of international reserves that a country should hold with respect to its cost. The results show that, in the first regime, a 1 percent increase in international reserves is associated with a reduction in sovereign spread of 1.3 percent in Model 1. In other words, an increase in international reserves below the 4.83 months of imports is associated with a reduction in the opportunity cost.¹⁰ However, above the threshold level, an increase in international reserves is associated with an increase in sovereign spread, which suggests an increase in the cost of holding reserves in the second regime. In other words, an increase in international reserves is associated with a reduction opportunity cost up to the threshold level. In addition, continuing to increase the international reserves above the adequate level is associated with increased opportunity cost. On the other hand, holding sovereign debt is associated with an increase in opportunity cost in the first and second regimes with 0.81 percent and 0.44 percent respectively. In summary, increasing the international reserves and sovereign debt in the first regime is associated with a net negative effect implying a decline in the opportunity cost whilst, above the threshold level, an increase in the international reserves and sovereign debt is associated with an increase in the opportunity cost.

¹⁰ The real exchange rate is also significant (at 5 percent significance level), implying that this factor is also important and needs to be considered in estimating the opportunity cost.

The impact of an increase in the holding of international reserves is consistent even with consideration of other external variables as in Model 2. The results show that the threshold estimates of the international reserves is at 4.96 months of imports, implying that a country has to save at least 4.96 months of imports in order to protect itself. In addition, the results also reveal that an increase in international reserves below the 4.96 months of imports is associated with a reduction in sovereign spread of about 0.70 percent.¹¹ Meanwhile, above the threshold level, any increase in international reserves is associated with an increase in sovereign spread, suggesting an increase in the cost of holding reserves. In addition, holding sovereign debt is associated with an increase in opportunity cost in the first regimes. However, the sovereign debt variable is insignificant (at 5 percent significance level) in the second regime even though it indicates that accumulating sovereign debt in the second regimes is associated with a decline in opportunity cost.

Thus, it is suggested optimal level for Malaysia to stock its international reserves up to 4.96 since above the optimal level country would incur cost at higher rate. In this case, there is less advantage to Malaysia if it continues to accumulate international reserves above the optimal level, since this is associated with higher opportunity costs. Furthermore, by continuing to increase the international reserves in the second regime, Malaysia is lowering her ability to repay the sovereign debt, which also increases the probability of the country falling into default.

Intuitively these results, which represent the period following the financial crisis, explain that, at this point of the period, the optimal level of international reserves that Malaysia should hold is higher than the conventional rules (3 months of imports) would recommend. With the hoarding of international reserves during the post-crisis period, a country could possibly learn a lesson to protect itself from any sudden shock. Although the optimal level of international reserves was found to be slightly higher than the conventional rule of three months of imports, Malaysia is holding too many international reserves, which could burden the country with excessive costs. This fact is also supported by

¹¹ The results are slightly higher than the threshold estimates found by Daud and Podivinsky (2011) for the case of developing countries.

Ramachandran (2004) that the rapid accumulation of reserves during the recent years does not reflect the optimal behaviour in the sense of the buffer stock model.

5. Conclusions and discussion

The objective of the present study is to analyze the impact of holding international reserves and sovereign debt with regard to its opportunity cost. Furthermore, this paper analyzes the cost of Malaysia's decision to jointly hold international reserves and sovereign indebtedness after the 1997 financial crisis. This paper also contributes to the literature by identifying the optimal level of international reserves that Malaysia should hold over the period of analysis from 2002Q1 to 2010Q4, thus evaluating the current position of international reserves held by Malaysia. The important empirical findings show that an increase in international reserves is associated with a reduction in sovereign spread up to its optimal level. Furthermore, this paper also provides evidence that Malaysia should hold international reserves at an optimal level of 4.96 months of imports, which is higher from the conventional rule of thumb of 3 months of imports. In other words, Malaysia incurred an increase in the opportunity cost with an increase of international reserves above the threshold level. In this case, there is less advantage to Malaysia if it continues to accumulate international reserves above the optimal level, since this is associated with higher opportunity costs. Meanwhile, by continuing to increase the international reserves, Malaysia is lowering her ability to repay the sovereign debt, which also increases the probability of the country falling into a default problem. The best decision for Malaysia is to hold the international reserves at the optimal level when the opportunity costs are at a minimal level. Holding fewer reserves than the optimal level might expose a country to a high risk of uncertainty and sudden shock. However, too high a level of international reserves (savings) is associated with a high cost as well as a reduction in the probability of a country repaying its sovereign debt.

Current development shows that Malaysia could finance about 9.3 months of retained imports, this leads has led to the issue of the reason for the increase in the stock of international reserves. This in turn points to the concern over whether the increase in the international reserves as months of imports is a reflection of the central bank behaviour of

continuing to increase the international reserves or whether it is due to the declining pattern in retained imports which is the denominator of the ratio. The pattern of Malaysia's international reserves during the period of 1990 to 2010 shows that, after the 1997 financial crisis, Malaysia started to increase the stock of international reserves. In addition, with the announcement of losses due to the United States sub-prime mortgage crisis, Malaysia drastically increased the international reserves as indicated by a steeper curve as compared to the period before the news (see Figure 2). This development signifies the fear of the contagion effect which has been translated to the accumulation of international reserves. However, it shows that, during July 2008, the total international reserves-holding started to exhibit a declining pattern before the trend was reversed to show an increase in reserves in August 2010, albeit at a lower rate. Thus could be due to the utilization of the international reserves during the late 2008 crisis. In contrast, the growth rate of retained imports shows a gradual increase from the period of 2004 before reversing to record a declining pattern during the period of 2005 to 2009. Thus, the increasing of the international reserves as a month of retained imports is also due to the decline in the growth rate of the retained imports being higher than the decline in the total international reserves-holding thus resulting in the higher ratio of international reserves as a month of imports. As such, looking blindly at the ratio of international reserves as a month of imports could lead to the misinterpretation of the central bank behavior in promoting monetary and financial system stability and fostering a sound and progressive financial sector.

On the other hand, the uncertainty condition in the economies of the Asian crisis-hit countries would indicate the countries' behavior in saving too many of international reserves in the late 2000s (Daud and Ahmad, 2013). Furthermore, China that holds the highest stock of international reserves also aims for a self-insurance motive. Persistent trade surplus as well as rising private capital inflows could be the best explanation of this phenomena. It is notable that China's large holding of international reserves is associated with some unavoidably high cost such as quasi-fiscal cost, opportunity cost, financial repression cost and economic distortion cost (Yongzhong and Freeman, 2013). Current development shows that government of China is struggling to restore balance to the economy with strict capital control since the economy has

experienced the inflationary effect of the high capital inflows. A short-term capital inflows through the banking system provide an excessive domestic credit, thus push-up the inflation rate. The risk of sudden shock in the event of speculative capital flows as well as the interdependency on the trade balance would also become a worries by the economist and China's policy maker. As such, the episode of high level of international reserves has shown the negative cost to the economy with China started experience the heat of the effect.

Apart from the fundamental economic conditions, political risks of the domestic economy could possibly contribute to an explanation of a country's decision on holding international reserves. Since the political risk factor could be a potential indicator to measure a country's economic health as well as unstable condition in the economy, the association of the political risk factor and demand for international reserves would provide an important and interesting avenue for future research.

Table 3: The bounds test for the existence of linear relationship

Model	F statistics	Significance level	Pesaran et al. (2001) critical values		Narayan (2004) critical values	
			I(0)	I(1)	I(0)	I(1)
Model 1 SSP (EDEBT, RESV, intercept)	0.867	5 percent	3.793	4.855	3.458	4.343
		10 percent	3.182	4.126	2.863	3.610
Model 2 SSP (EDEBT, RESV, REER, intercept)	0.276	5 percent	3.219	4.378	3.170	4.160
		10 percent	2.711	3.800	2.618	3.502

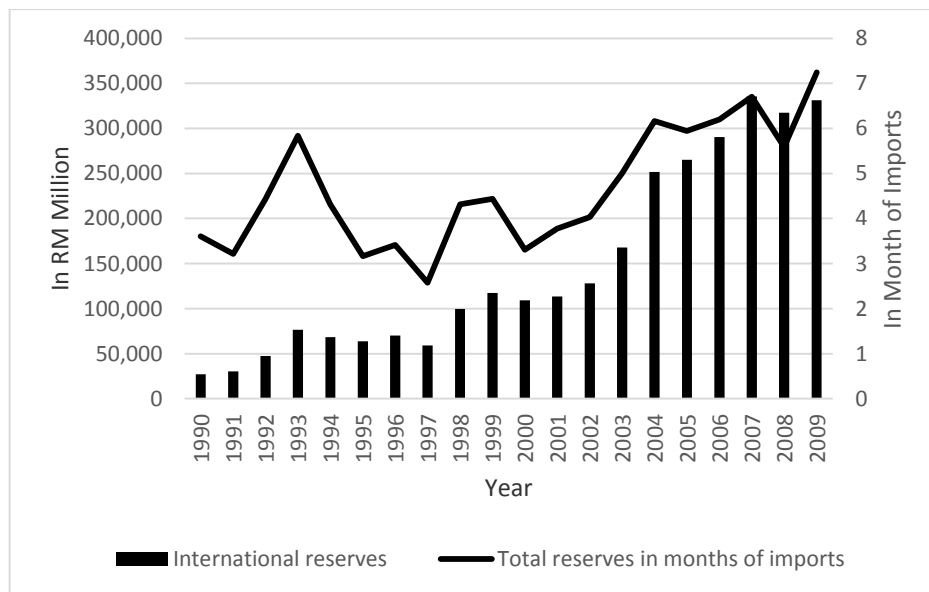
Notes: * and ** denotes significant at 5 and 10 percent significance level. Numbers in brackets represent the standard error. The null hypothesis is no long-run relationship.

Table 4: Results of threshold regression

<i>Sovereign spread</i>	Model 1 SSP (ED, RESV)	Model 2 SSP (ED, RESV, REER)
<i>F-test statistics</i>	617.61*	269.84*
<i>Bootstrap p-value</i>	0.000	0.000
<i>95 percent confidence interval</i>	[4.736,4.832]	[4.687,4.956]
	First regime	
<i>EDEBT</i>	0.806 (0.016)*	0.295 (0.134)*
<i>RESV</i>	-1.312 (0.052)*	-0.695 (0.139)*
<i>REER</i>		-0.432 (0.123)*
<i>Intercept</i>	9.451 (0.232)*	12.78 (1.070)*
<i>R-Squared</i>	0.99	0.99
Threshold estimates	$q_i \leq 4.83$	$q_i \leq 4.96$
	Second regime	
<i>EDEBT</i>	0.438 (0.017)*	-0.059 (0.176)
<i>RESV</i>	0.205 (0.070)*	0.201 (0.075)*
<i>REER</i>		-0.571 (0.218)*
<i>Intercept</i>	-2.863 (0.927)*	5.921 (3.139)*
<i>R-Squared</i>	0.99	0.98

Notes: * and ** denotes significant at 5 and 10 percent significance level. The null hypothesis is no threshold relationship. Numbers in brackets represent the standard error. All variables are expressed in natural logarithms.

Figure 2: The pattern of total international reserves and reserves in month of imports



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Deposit Behavior and Its Impact on Loan: A Case Study on Rajshahi Krishi Unnayan Bank (RAKUB), Bangladesh

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Deposit mobilization and loan distribution are the main products of any bank. Deposit behavior and its impact on loans are very important for any banking operation. The success of a bank depends on the positive deposit behavior and loan recovery situation. Rajshahi Krishi Unnayan Bank (RAKUB) is the largest rural development partner in the agriculture based Northwest region of Bangladesh. The present study examines the deposit behavior of the bank. The study also analyses the impact of deposits on loan disbursement activities of RAKUB. The study is basically analytical and interpretative in nature considering the objectives of the study. A two-variable regression model has been adopted to analyze and process the empirical data on deposits and loans of the study bank. The study reveals that there is a strong relationship between loans and deposits and the behavior of deposits affects lending a large extent. The value of the correlation coefficient indicates that the two variables, loans and deposits are highly positively correlated. The study shows that deposits are a major factor in bank fund management and it has a significant impact on loans and advances. Finally, RAKUB should cautiously maintain balance between loans and deposits for its survival in the competitive world of business.

Introduction

The deposit behavior, interest rates and loan recovery programs are critical in understanding the micro-economic functions of a country. The banks are showing different financial structures in deposit behavior

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according to their credit view. From a micro-economic perspective, banks have allocated incentives to change the prices of their loans and other advance distributions. Banks with large capital or large market share have taken initiatives to change high loan mark-ups and adjust the loan and interest rates in changing market conditions. Again, corporate loans are more competitive relative to consumer products in the bank assets. The interest rates of demand and savings deposits are very rigid in the case of bank liabilities. The financial structures and liabilities of banks' are influencing on interest rates and deposits. The deposit interest rates tend to be more rigid upwards when the adjustment for loans is occurring relatively symmetric (Ferre *et al.*, 2007). Zarruk (1989) showed that increases in bank capital can increase the intermediation margin while deposit instability reduces the margin. Madura and Zarruk (1992) revealed that increases in bank capital and deposit reduced borrowing and lending margins. Usually in a single words bank is the deposit mobilization institute and loans and advances is the main product of its.

There is a fundamental concept; banks are operating in the business of borrowing and lending money. From this concept, banks have been positioned as a market maker or dealer (Bryan and Stock, 2004). According to Ho and Saunders (1981), banks are dealers in loan and deposit markets. But the major difficulties in managing the process is that loans and deposits turn up stochastically and not in a predictable fashion. They show that a bank has charged an intermediation fee for the instant provision of loan and deposit accounts to its customers according to the market condition. In this case intermediation fee depends on management's risk aversion, the bank's market arrangement, the size of bank transactions, and the difference of interest rates. Several researches focused that intermediation margin are related with various types of ambiguity in banking activities (Bryan and Stock, 2004). Again, Wong (1997) examines the intermediation margin under interest rate risk and finds that are positively related to market power, bank working costs, and risk aversion. The revenues obtained from making a loan are dependent upon a rational process for prepayments by borrowers. The borrowers are prepaying their loans when decrease the level of interest rate. However, prepay realized if interest rates fall below the lending rates. These situations influence the depositor to withdraw funds due to lower level of interest rates. Again, the bank's cost of acquiring depends on savings and withdrawals of depositors. Angbazo (1997) has shown

empirically that banks with riskier loans and higher interest rate risk exposure enjoy higher intermediation margins. Allen (1988) has shown the impact of bank products upon the intermediation margin. The margin is dependent on monopoly power, a risk premium and multi-product diversification of market. From the above discussion, it is clear that deposit behavior and its impacts on lending are very important for any banking operation. The success of a bank depends on the positive deposit behavior and loan recovery situation.

Bangladesh is a developing country that majority peoples living under the poverty line. Bangladesh has been an agriculture based country from its very beginning. Most of the people depend on agriculture. The performance of this sector has a major impact on the overall economic development of the country. From British ruled to date, farmers of the country dominant in various ways. Therefore, in 1932 India-British govt. took a step forward the socio-economic development of the small and marginal farmers of Bengal to disburse agricultural loans. The government of Pakistan established a financial institution named “Agricultural development finance corporation” (ADFE) on account of disbursement of loans in the agricultural sector in 1952. Feeling the importance of agro-production and agro loan of the Pakistani Govt. established another bank namely “Pakistan Krishi (Agriculture) Bank” in 1957. After the Liberation war Bangladesh Govt. denoted the Pakistan Krishi Bank as Bangladesh Krishi Bank (BKB) in 1973 according to the presidential order 27. As Bangladesh grew as an agro-based country, the demand for agro-loan distribution of Agriculture Bank has been increased highly. It become very difficult to manage agro-loan in the Dhaka based head office of Krishi bank in the remote areas of the country. For this reason the Bangladesh government wanted to decentralize the Krishi Bank into the divisional areas. The people of the Northern areas of Bangladesh are lagging behind in all respects compared to the other parts of the country. That is why in 1986, according to the president’s ordinance no. 58, Rajshahi Krishi Unnayan Bank (RAKUB) was established. From March 15, 1987 RAKUB has started its official functions (Khan, 1995).

As the agriculture is main source of income to the people of Bangladesh, then their economic condition is not satisfactory. Therefore most of the people willing to go savings their money in any financial institutions including banks. The banks collect and accumulated their savings

through different deposit accounts (current, savings, fixed deposits and so on) to increase current assets. Loans and advance is the key asset for a bank and it tried to collect huge deposits from the clients. The goal of commercial bank and others including specialized banks of the Bangladesh have to collect deposit in a low rate of interest and to provide loan disbursements in a high rate of interest. Loan may be defined as money lent at interest or on profit. It is nothing but temporary parting with one's [an individual or an institution] resources in order to augment the purchasing power of the receiver of such facility with a promise to return the same with interest profit or otherwise as mutually agreed upon. The commercial banks and others specialized banks of the country often disburse there loans against the existing current deposit account of the client or loan receiver. The bank provides the sanctioned credit through the account. Usually banks do not sanctioned loan disbursement without any deposit account of that bank. The clients submit proposal to bank authority against his/her deposit account which have of that bank for receiving loan. So there is great effect by deposit behaviors on the loan disbursements in Bangladesh.

Movements in market interest rates, foreign exchange rates and purchasing power of parties (loan receivers) have potent effect on banks deposit behaviors and loan disbursement that is reflected through the margin of revenue of bank in Bangladesh. For example, if the interest rate rises so high, the purchasing power of loan receivers becomes costly that adversely affect the banks' amount of loan distributions. As a result, banks ability to disburse loan decrease than before. Besides, increase in interest rate lowers returns from earning assets and reduces the net worth that result in lower margin of profit. Again, if the interest rate falls, but not sharply, loan distribution becomes cheap that helps banks to boost up their fund collection. Therefore, banks ability to disburse loan increases. As a result banks can earn high margin of profit. On the other hand, if the interest rate rises against deposit reserve, the depositors willing to more deposit in banks. Then banks deposits will be higher than previous period. This situation also creates in Bangladesh, when foreign exchange rates will high against country's currency. The non residents Bangladeshis (NRB) sent more remittances in this period. As a specialized bank, above situations also influence the deposit behaviors and loan disbursements of RAKUB. The present study examines the deposit behavior of RAKUB. The study also analyses the impacts of deposit on loan disbursement activities of RAKUB.

Significance of the Study

Deposit behaviors effect on the loan disbursements which is important matter of Bangladesh perspective. The banks imposed different terms and conditions during the loan disbursements. The banks impose terms and conditions as to collateral security and equity of the loan receivers. The collaterals are either movable or immovable. Usually to keep mandatory liquidity position and deposit balance bank's imposed terms and condition on loan disbursements. The banks fall in deep trouble, if not recover the loan from the borrowers. To reduce risk bank took different collateral to the borrowers. Again bank must keep a given portion of deposit amount following the loan disbursement. Because the deposit holders of the bank might be retrieve their savings any time or a certain period from the bank. For this reason each banks are alert to collect much deposits then took decision on loan disbursements. In this sense we can say that bank is the holder of borrowing money while its loan disbursements decision is greatly depend on deposit collection. Bank's loan disbursements do not exceed its deposit. Besides, deposit behavior effect on loan disbursement by liquidity position and strategies, optimum liquidity and selection of good borrowers. The commercial and others banks of Bangladesh maintain their loan disbursements activities much and more basis on the deposit collection due to present world recession as well as reduce the bank's default risk. The study of deposit behaviors effect on the loan disbursements is very much important in Bangladesh perspective. To avert any business risk and financial risk banks must be emphasis on this study.

Method and Materials

Data Attainment: The study is basically analytical and interpretation in nature considering the objectives of the study. Secondary data from the Paba branch of RAKUB have been used in this study. For collecting secondary data various journals, books, periodicals and annual reports of the relevant organizations have been reviewed carefully. We decided to employ a quantitative descriptive method for analyzing the empirical data. Two-variable regression model has been adopted to analyze and process the empirical data on deposits and loan of the study bank.

The two-variable regression model is i.e; $Y=a+bx$

Where,

Y= Dependent variable
X= Independent variable
a= Intercept term
b= Slope

Hypothesis:

H₀: There is no relationship between loan and deposit.

H₁: There is relationship between loan and deposit.

RAKUB: Rajshahi Krishi Unnayan Bank (RAKUB) is the largest rural development partner in the Northwest region of Bangladesh. It aims at the overall development of the farmers' livelihoods and the sectors of agriculture in this region. The main objectives of RAKUB are providing credit facilities for all kinds of agricultural and agro-based economic activities, earning a normal profit for meeting the operational expenses and extending counseling and advisory services to the borrowers and entrepreneurs (Khan, 1995). A seven-member board of directors is responsible for policy formulation and decision of the bank. The government has appointed all the directors of the board. An executive body comprised of the chairmen and two other directors including the managing director is taking emergency decisions for operational activities. The managing director is the chief executive of the bank. The bank is functioning in agriculture credit, financing agri-business and agro-based industries and poverty alleviation programs as well as commercial banking functions (Shekhar, 1991).

Branch Network:**Table- 1:** Region wise total branches of RAKUB (up to June 2006)

Region	Branches
Bogra North	20
Bogra South	14
Chapaynawabgong	16
Dinajpur North	15
Dinajpur South	17
Gaibandha	24
Joypurhat	15
Kurigram	19
Lamonirhat	17
Noagoan	27
Natore	20
Nilphamari	20
Pabna	22
Panchagang	18
Rajshahi	23
Rangpur	26
Sirajgong	22
Thakurgaon	22
Total	357

Employee Summary (up to June 2008):**Table- 2:** Authorized and Existing employees of RAKUB

Designation	Authorized	Exist
1. Managing Directors (MD)	01	01
2. Deputy Managing Directors (DMD)	01	01
3. General Manager (GM)	03	03
4. Deputy General Manager (DGM)	25	17
5. Assistant General Manager (AGM)	48	34
6. Senior Principal Officer (SPO)	120	92
7. Principal Officer (PO)	319	236
8. Senior Officer (SO)	594	470
9. Officer	897	780
Total Officer	2008	1634

Source: Personnel Department of RAKUB

Table-1 shows that there are 357 branches of RAKUB under 18 regions of the northern part of Bangladesh in 16 districts. The highest numbers of branches are situated in Noagoan region. On the other hand, the lowest numbers of branches are situated in Bogra south region. Table-2 reveals the authorized and existing employees of RAKUB. The authorized employees of bank are 2008. But the existing amounts of employees are 1634. The table shows that highest amount of vacant posts in Officer, Senior Officer and Principal Officer levels.

Like other organizations, RAKUB has own techniques to evaluate their employees' performance. On the basis of that they reward the employees through promotion or other benefits. Some employees of this bank are left here to other banks due to get extra benefits and salary opportunities. So create employee crisis in the bank which impact on deposit collection and loan disbursements procedure. For collection and maintenance the deposits, monitoring and supervision loans disbursements bank require sufficient manpower those are not shortage in RAKUB. Such due to manpower shortage hampering the observe and supervise the loan applicant before approving the loan, after approving and disbursing the loan supervise and monitor the cash inflow and outflow until the full repayment of the loan as well as retain the most creditworthy borrowers based on their past repayment history and make them repeat customers.

Results and Discussion

Table-3: Deposits Scenario of Paba Branch, RAKUB, 2005-2009

Name of Deposit	2005	2006	2007	2008	2009 (up to June)
Current Deposit	6844729	7673991	5873589	7480667	7337115
Sundry Deposit	950936	1081656	1044717	1357909	1863007
Saving Deposit	30907111	35379418	40282188	42274389	42927450
Short Term Deposit (STD)	6466606	9931764	20303978	22402543	61404552
Fixed Deposit Receipt (FDR)	4599616	3679829	3336294	2680679	3057064
Deposit Pension Scheme (DPS)	19800496	17984937	9895138	2397828	2687973
RAKUB Saving Scheme (RSS)	4402455	5842757	7232398	8669028	10301995
Total	73971952	81574353	87968303	87281245	129579198

Source: Annual report of RAKUB, Paba Branch, Rajshahi

Table-4: Loan and Advance Scenario of Paba Branch, RAKUB, 2005-2009

Name of Loan & Advance	2005	2006	2007	2008	2009
Rural Credit (RC)	280539	233008	601366	1339997	1599727
General Credit (GC)	426994	-----	9459	89075	331550
Commercial Loan	1904235	1891052	3849580	4436367	5626728
Loan against Provident Fund	1945576	2268692	2023965	2054438	1108577
Savings Over Deposit (SOD)	2589491	3179416	2676485	1618118	1108577
Current Credit (CC)	604445	918069	870445	-----	1690657
Specialized Social Investment (SSI)	419789	192025	57605	-----	826200
Total	8171069	8682262	10088506	10334195	11133379

Source: Annual report of RAKUB, Paba Branch, Rajshahi

Table-3 presents the deposits scenario of Paba Branch from 2005 to 2009. Several types' deposits are posing different conditions in year by year. The highest amounts of current deposit are shows in 2006, sundry deposit in 2009, saving deposit in 2009 and STD in 2009. Again, highest amounts of FDR are represents in 2005, DPS in 2005 and RSS in 2009. The highest amounts of deposits are collecting in 2009 a total of Tk. 129579198. Table-4 reveals the loan and advance scenario of Paba Branch from 2005 to 2009. Several types' loans are posing different conditions in year by year. The highest amounts of rural credit are shows in 2009, general credit in 2005, commercial loan in 2009 and loan against provident fund in 2006. On the other hand, highest amounts of SOD are distributes in 2006, CC in 2009 and SSI in 2009. The highest amounts of loan and advances are distributing in 2009 a total of Tk. 11133379.

Regression Analysis:

The modern interpretation of regression is quite different. Regression analysis is concerned with the study of the dependence of one variable, the dependent variable, on or more other variables, the explanatory variables, with a view to estimating and predicting the (population) mean or average values the former in terms of the known or fixed (in repeated sampling) values of the latter.

The two-variable regression model is $Y = a + bx$ i.e;

Where,

Y= Dependent variable, Loans

X= Independent variable, Deposits

a= Intercept term

b= Slope

From the above equation we can calculate a regression line which shows the deposit behavior and its impact on loan.

Table-5: Total Deposits and Loan Scenario of Paba Branch, RAKUB, 2005-2009

Year	Deposits (X)	Loan (Y)
2005	73971952	8171069
2006	81574353	8682262
2007	87968303	10088506
2008	87281245	10334195
2009	129579198	11133379

Table-5 shows the total deposit and loan distribution of Paba Branch from 2005 to 2009. From the table, we are analyzing the regression model.

Model Summary:

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
1	.824	.679	.572	799520.04183

A= All requested variables entered. B= Dependent variable, Loan.

Comments: Above model summary table shows that R-value is 0.824 that means the coefficient correlation are remaining between deposit and loan. R square value 0.679 means that independent variable explaining the dependent variable 67.90 percent.

Coefficients (A):

Model	Unstandardized	Coefficient	t	Significant
1 (Constant)	5407089.101	1733125.871	3.120	.052
Deposit)	.046	.018	2.521	.086

Comments: From above Coefficients table shows that Intercept term and coefficient of Deposit value is 5407089.101 and 0.046 respectively. The p-value is 0.052 and 0.086 both are accept at 10 percent level of significant.

ANOVA (B):

Model	Sum of Squares	df	Mean Square	F	Significance
Regression	4061798041837.431	1	4061798041837.431	6.354	.086
Residual	1917696891885.369	3	639232297295.123		
Total	5979494933722.800	4			

A= Predictors (Constant), Deposit. B= Dependent variable, Loan.

From ANOVA table F statistic is (0.086) less than less than 0.10 (say level of significance 10%). It also revealed that our model is about 91 per cent true which means loan disbursement is depend on deposit mobilization. By putting the value in the regression model, we get the following equation,

$$Y=5407089.101+0.046x$$

From the regression model following calculation we found intercept term 5407089.101 that means loan will be distributed this amounted after have no any deposits (zero deposit) of the bank. If Taka 1 deposit increases then loan will be distributed 4.6 per cent.

Hypothesis Testing and Interpretation

In the study, null hypothesis is there is no relationship between loan and deposit. On the other hand, alternative hypothesis is there is relationship

between loan and deposit. The null hypothesis of a study is reject, if F-Sig value less than the value at the level of significance 0.10 (10%). The ANOVA table shows that F significance value that is 0.086 which is less than level of significance 0.10. From the above result, the study accepts the alternative hypothesis that means there is relationship between loan and deposit. So the finding is statistically significant. Therefore it is vivid that there is a strong relationship between loan and deposit and the behavior of deposit affects the loan to a large extent. Moreover the value of the correlation coefficient means that two variables loan and deposit are highly positively correlated.

Conclusion

RAKUB is the nationalized agriculture bank of the country. The Paba branch, Rajshahi has some prospective sides that are definitely encouraging. These are, cost of fund is being reduced in recent years, loan disbursement position is excellent, bad debts amount is decreasing and profit generating is increasing. RAKUB has been established a training institute for the personnel training and human resource development under separate management. On the other hand, there are some problems also remaining in the Paba branch which creates disadvantage in progress. The problems are the loan providing position especially in agro-based industry is poor; deposit mobilization is low, lack of proper co-ordination among officials, modern banking facilities and communication network, amount of fixed deposit is high and major variability in loan disbursement. To recover the problems, the branch can take some initiatives, such as proper supervision to protect the misuse the fund and reducing cost, management audit should be followed and developed the Management Information System (MIS), loan should be disbursed after properly assessment, proper steps have been taken against bad debts and value of service should be increased. The study revealed that deposit is the major factor for bank fund management and it has a significant impact on loan and advances. Therefore, the bank should cautiously maintain a balance loan and deposit for its survival in the competitive world of business.

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Causality between Government Expenditure and National Income: Evidence from Sudan

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This study aims to determine the nature and direction of causality between government expenditure and national income in Sudan using Granger causality test and Error Correction Model (ECM) for the period 1970-2008. The result of cointegration test shows a long-run relationship between government expenditure and national income in Sudan. The causality test indicates that the direction of causality running from government expenditure to national income, both in the short and long-run. Thus, the results support the Keynesian proposition, which states that public spending is an important exogenous factor for stimulating national income. Moreover, the study concludes that fiscal policy in Sudan plays a vital role in stabilizing the economy and achieving economic goals.

1. Introduction

The causal relationship between government expenditure and national income has been one of the debatable issues among the economists and policy makers, for a long time. Theoretically, there are two conventional views on the relationship between the two variables. First, Wagner (1890) observed that as the real income per capita of industrializing nation increases, the share of public expenditures in total expenditure also increases. This observation led to the so called Wagner's law, which assumes a unidirectional causality running from national income to government expenditure. On the other hand, Keynes (1936) argued that public expenditure is an exogenous factor and important fiscal policy instrument that affect national income. In other words, according to the Keynesian thought changes in government expenditure cause

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changes in income, implying that the direction of causality runs from government spending to national income without any feedback.

As a result of such debate, empirically there are extensive studies on the relationship between government expenditure and income, used different specifications, different sample periods, and data from different countries. However, all these findings were failed to reach a definite answer for the question of causality between the two variables. In other words, some empirical results confirm the Wagner view rather than the Keynesian hypothesis, while other findings advocate the Keynesian view. Therefore, the lack of consensus both in theoretical and empirical literature on the nature of the relationship between government spending and income is one of the motivations of this study.

Moreover, the simultaneity of increasing in government spending and disappointing economic growth of the developing countries, in last decades has raised many questions regarding the role of government spending in economic performance (see Scully, 1989). In Sudan for instance, the government size has undergone obvious expansion during the last four decades, with annual increase amounted on average about 20%. On the other hand, the growth rate of national income of the country has experienced low and fluctuated rates (see, Appendix).

Given the issues noted above, the ultimate objective of this study is to examine the causal relationship between government expenditure and national income in Sudan, using the Granger causality test and error correction (ECM) model. The dearth of studies on such issue in Sudan lead this paper contributes to the ongoing literature on the relationship between government expenditure and income. The study also provides decision makers in Sudan with some policy implications regarding the government spending measure.

The rest of the paper is organized as follows: Section (2) reviews the theoretical literature and previous studies on the relationship between government spending and national income. Section (3) discusses the data and methodology. While section (4) presents the empirical results, section (5) ends with conclusion and policy implications.

2. Previous Empirical Studies

Influenced by the substantial increase in the size of government in both developed and developing nations after the World War II, a large body of empirical literature has grown aimed at testing the causality between government expenditure and national income. Most of these studies used individual countries time series data, employing cointegration and Granger causality techniques; whereas, a few others approached the question adopting cross-section and panel data regressions. Nevertheless, still their results are inconclusive regarding the causality between government spending and national income.

Singh and Sahni (1984) examined the direction of causality between national income and public expenditures in India, using annual data covering the period of 1950-1981. They employed Granger's causality test, and found no evidence of causality between government spending and national income. Therefore, their finding neither confirms the Wagner's law nor the Keynesian view.

Abizadeh and Yousefi (1998) examined the Wagner's law in South Korea over the period 1961-1992. Initially, they conduct Granger type causality tests, and then estimate a government expenditure-growth equation. Their results pointed out that economic growth significantly causes the government expenditure; hence, the Wagner's paradigm is satisfied. Further, the results of the growth equation estimations revealed that government expenditures did not contribute to economic growth in South Korea.

In the same vein, Islam (2001) examined the relationship between government expenditures and real GDP per capita for the USA, using annual data for the period 1929-1996. He found that there is a long-run relationship between the two variables using Johansen-Juselius's cointegration approach. Moreover, Wagner's hypothesis is strongly supported by their results of Engle-Granger (1987) error correction approach. For the case of Malaysia, Tang (2001) investigated the causal relationship between national income and Government expenditure during the period 1960 to 1998. He found that no long run relationship among the variables, indicated by cointegration test. Further, the study revealed a unidirectional causality running from national income growth

to Government expenditure growth. Thus, he concluded that Wagner's law is supported only in the short run.

In the context of cross-section approach, many studies have addressed the casual relationship between government expenditure and income, Ansari et al. (1997); Al-Faris (2002); Dogan and Tang (2006) and Mo (2007), among others. For example, Ansari and others (1997) examined the causality between government expenditure and national income for three African countries (Ghana, Kenya, and South Africa) using standard Granger test and its modified version - the Holmes- Hutton (1990) causality test. The study uses annual data on per capita government expenditure and national income for the period from 1957 to 1990. The study finds that for the three countries under investigation, there is no long run equilibrium relationship between government expenditure and national income over the sample period. For these countries, also there is no evidence of Wagner's hypothesis or the reverse being supported in the short run, except for Ghana where Wagner's law is satisfied.

Dogan and Tang (2006) examined the direction of causality between national income and government expenditure for five south East Asian Countries (Indonesia, Malaysia, Philippines, Singapore, and Thailand). Using Granger causality test, a unidirectional causality runs from government expenditures to national income has been found only in the case of Philippines. Whereas, for the other countries, their results rejected the hypothesis of causality from government expenditure to national income and vice versa.

Interestingly, Al-Faris (2002) used a multivariate cointegration and Granger causality tests, examined the causality between government expenditure and Growth for Gulf Cooperation Council (GCC) countries. He found that there exists a long-run relationship between national income and total spending, capital spending and current spending. Moreover, for the majority of the gulf countries, the Wgner's law is satisfied, while the Keynesian hypothesis is rejected. Al-Faris argued that despite the huge size of government in Gulf countries as a result of oil wealth, the government expenditure does not cause the economic growth and could not be considered as an important fiscal policy tool.

Abu-Bader and Abu-Qran (2003) investigated the causal relationship between government expenditures and economic growth for Egypt, Israel and Syria. They found long-run bidirectional causality between the two variables in Israel and Syria. A unidirectional short-run causality from economic growth to government expenditure was found in the case of Egypt. Abu-Bader and Abu-Qran concluded that those countries have been suffered the burden of military spending.

The above discussion has made it clear that the literature on the causality between government expenditure and national income is extensive and diverse. However, there is a dearth of studies on such issue in the Arab countries in general and Sudan in particular. Therefore, this study will be a significant contribution to ongoing literature on the relationship between government spending and income, in developing countries.

3. Methodology and Data

3.1. Econometric Methodology

To examine the direction of causality between government expenditure and income in the short-run and long-run, the paper uses Granger causality test and error correction model. The starting point in the causality test is to determine the order of integration of each variable. It is well known that when dealing with time series data, stationarity tests are pre-tests to avoid the problem of spurious regression (Engle and Granger, 1987). Using the specification provided in equation (1) below, we test for stationarity of the series using Augmented Dickey Fuller (ADF) (1979 and 1981), and Phillips and Perron (1988) tests:

$$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \alpha_2 trend + \sum_{j=1}^{\rho} \beta_j \Delta y_{t-j} + \mu_t \quad (1)$$

Where Δy_t indicates the first difference of y_t and ρ is the lag length of the augmented terms for y_t . Equation (1) allows us to test whether the variable y_t is a stationary series. The null hypothesis in the stationarity test is that y_t is non-stationary or has a unit root.

After determining the order of integration of the variables through unit root test, the next step is to check the presence of a long-run relationship between variables, using cointegration test. This because one of the purposes of this study to determine the long-run relationship between the two variables. Also, the presence of cointegration between the variables indicates existence of Granger causality in at least one direction (Engle and Granger, 1987). Therefore, the study employs Johansen and Juselius (1990) multivariate cointegration test, specified as a VAR model with k order:

$$y_t = A_1 y_{t-1} + \dots A_k y_{t-k} + Bx_t + \varepsilon_t \quad (2)$$

Where y_t is $(n \times 1)$ vector of non-stationary I(1) variables, x_t is d -vector holding deterministic term (intercept, trend, dummies, etc), A_t is an $(1 \times n)$ matrix of parameters, and ε_t is a white noise term. This VAR specification can be rewritten in first difference to yield the following vector error-correction model (VECM):

$$\Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta y_{t-i} + Bx_t + \varepsilon_t \quad (3)$$

Where

$$\Pi = \sum_{i=1}^k A_i - I \text{ and } \Gamma_i = - \sum_{j=i+1}^p A_j$$

Equation (4) is simply an error correction representation of the VAR system embodied in equation (3). In Engle Granger representation theorem (1987), the matrix Π has a reduced rank $r < k$, it can be expressed then as $\Pi = \alpha B'$. Where α and B are $(n \times r)$ matrices and r is the rank to be tested. Also, α represents the speed of adjustment to disequilibrium (error correction model), while B' is matrix of long-run coefficients and each column of B' gives an estimate of the co-integration vector.

The number of cointegrating relations varies between 0 and $n - 1$, therefore the Johansen procedure for testing co-integration focuses then on the rank of Π . Johansen and Juselius (1990) developed two likelihood ratio test statistics. The first one is the maximum eigenvalue (ME) test and is given by $j_{ME} = -T \ln(1 - \lambda r)$ where T is the sample size and λr is the maximal eigenvalue. This tests the null hypothesis of r co-integration vectors against the alternative hypothesis that $r + 1$ exist. The second test is likelihood ratio (LR) test which tests the null hypothesis of r cointegration relations against the alternative of k cointegration relations, where k is number of endogenous variable, for $r = 0, 1, \dots, k - 1$. The test based on the trace stochastic matrix and given by $j_1 = -T \sum \ln(1 - \lambda_i)$.

Having examined the properties of the data, the next step is to test causality using Granger type causality test and error correction model. First, the study employed the standard Granger causality (1969) test, specified as follows:

$$LY_t = \alpha_1 + \sum_{i=1}^p \beta_{1i} LY_{t-i} + \sum_{j=1}^q \delta_{1j} GE_{t-j} + \varepsilon_1 \quad (4)$$

$$LGE_t = \alpha_2 + \sum_{i=1}^p \beta_{2i} LY_{t-i} + \sum_{j=1}^q \delta_{2j} GE_{t-j} + \varepsilon_2 \quad (5)$$

Where: LY_t is the natural logarithm of real GDP as proxy of the national income

LGE_t is the natural logarithm of real total government expenditure
 ε_1 and ε_2 are white noise error term, and q and p denote the lag order.

The Granger causality test is based on ordinary least squares (OLS) estimates of equation (4) and (5) and conventional Fisher-Snedecor F-test of joint statistical significance. Since the causality test sensitive to the lag order, the optimal lags length were specified based on the Akaike Information Criterion (AIC) and Schwartz information Bayesian Criterion (SBC). The null hypothesis for equation (4) is that LGE does not Granger cause LY. This hypothesis will be rejected if the coefficients of the lagged LGE (Summation of δ_{1j} as a group) are found

to be jointly significant (different from zero). The Null hypothesis for equation (5) is that LY does not granger cause LGE. This hypothesis would be rejected if the coefficient of the lagged LGE (Summation β_{2i} as a group) is found to be jointly significant. If both of these null hypotheses are rejected, then a bidirectional relationship is said to exist between the two variables (Government expenditure (GE) and National Income (Y)).

In addition to Granger causality test, we will use the error correction model to test the causal relationship between the two variables in the long-run². This test type causality depends on the error correction term derived from the cointegration equation. If the LY and LGE are cointegrated, an ECM representation could have the following form:

$$LY_t = \alpha_1 + \rho_1 e_{t-1} + \sum_{i=1}^p \beta_{1i} LY_{t-i} + \sum_{j=1}^q \delta_{1j} GE_{t-j} + \varepsilon_1 \quad (6)$$

$$LGE_t = \alpha_2 + \rho_2 e_{t-1} + \sum_{i=1}^p \beta_{2i} LY_{t-i} + \sum_{j=1}^q \delta_{2j} GE_{t-j} + \varepsilon_2 \quad (7)$$

Where e_{t-1} represent one period lagged error-correction term captured from cointegration regression, ρ is the error correction coefficient. The error correction based causality test provides inference of long-run causal relationships, which is obtained through the significance of the coefficients of ρ_s . However, there are four possibilities to be considered, first, if ρ_1 is negative and significantly different from zero, this will indicate long-run unidirectional causality from GE_t to Y_t . Second, if ρ_2 is negative and significantly different from zero, this will suggest long-run unidirectional causality from Y_t to GE_t . Third, if ρ_1 and ρ_2 are negative and significant, then there is log-run bidirectional causality

² - The (ECM) has an advantage in testing causal relationships over the standard Granger test. This because the latter suffering from the following two methodological deficiencies: First, these standard tests do not examine the basic time series properties of the variables, if the variables are co-integrated, then these tests in incorporating differenced variables will be miss-specified unless the lagged error correction term is included, see (Granger, 1988). Second, these tests turn the series stationary mechanically by differencing the variables and consequently eliminating the long-run information embodied in the original form of the variables.

between Y_t and GE_t . Fourth, if ρ_1 and ρ_2 are positive and insignificant, this implies that the two variables are independent.

3.2. Data Definition and Sources

The data used in this study are annual time series data on real GDP and real total government expenditure³ covering the period 1970-2008. This period is chosen because since 1970 the Sudan economy has suffered from many economic problems, particularly budget imbalance and augmentation of the government size. The data were sourced from various issues of the Central Bank of Sudan (CBOS) and the Central Bureau of Statistics (CBS) of Sudan⁴.

4. Empirical Results

In this section we present and discuss the results of the empirical analysis, first we test for time series properties using unit root and cointegration tests. Next, the results of causality on the relationship between government expenditure and income will be presented and discussed.

4.1. Unit root and Cointegration Test

Before conducting the Granger causality test, variables were tested for a unit root using Augmented Dickey-Fuller (*ADF*) and Philips-Peron (*PP*) unit root tests, through the estimation of equation (1). A number of lag two are chosen according to the minimum Akaike Information Criterion (*AIC*). The results of unit root test for each variable with constant and trend were presented in Table (1). The results show that the two series are nonstationary at level. When taking the variables in their first difference, the results show that all are stationary; therefore, we can conclude that all the series are integrated of order one.

³ - According to the literature on the relationship between government expenditure and income, GDP is used as proxy for the national income, see Dogan and Tang (2006).

⁴ - See the plot of real GDP growth and real government expenditure in the Appendix. A visual inspection shows upward trend of the data, implying that the variables may move together.

Table 1: Results of the ADF and PP -unit root tests

Variable	ADF		PP	
	Level	First Difference	Level	First Difference
GDP	-1.16	-3.25*	-1.34	-7.05***
GE	-0.41	-3.58**	-0.71	-7.19***

Notes: 1. *, **, *** indicate significance at 10, 5 and 1 per cent respectively

Having determined the order of integration of the variables, we test for cointegration to examine whether a linear combination of these series converge to equilibrium or not. Therefore, equation (3) of Johansen-Juselius multivariate cointegration was estimated with intercept term. Before undertaking the cointegration tests, the relevant order of lags (p) of the vector autoregressive (VAR) model was determined by Schwarz Information Criterion (SIC) and Akaike Information Criterion (AIC). The results of trace and maximal eigenvalue statistics obtained from the Johansen- Juselius (JJ) method using the assumption of linear deterministic trend in the data are presented in Table (2). The results of JJ multivariate cointegration test indicated that both trace and maximum eigenvalue test statistics simultaneously identify two cointegration relations between total government expenditure and national income, implying that there is long-run relationship between the two variables in Sudan. Thus, the existence of cointegration justifies the using of ECM to examine the causality between the two variables.

Table 2: Cointegration Test Results

Null Hypothesis	Eigenvalue	Trace statistics	95%	Maximum Eigenvalue	95%
None	0.4095	22.20*	15.49	17.91*	14.26
At most 1	0.1187	4.29*	3.84	4.29*	3.84

Note: 1. * denote rejection of null hypothesis at 5% level of significance.

2. Based on SIC. AIC a number of lag three was chosen in the cointegration analysis

4.2. Causality Test

Under this subsection we report the results of the direction of causality between government expenditures and National income in Sudan using Granger causality and ECM. First, the Granger test was performed through the estimation of VAR model of equation (4) and (5). The results of granger causality test within VAR structure in the first difference between the two variables are presented in table 3:

Table 3: Granger Test results

Direction of causation	F-value	p-value	decision
GE $\rightarrow$ GDP	4.85	0.0076	Do not reject
GDP $\rightarrow$ GE	0.76	0.5247	Reject

Note: As in the cointegration test a number of lag three was used in the Granger causality test.

The result of Granger causality test reject the null hypothesis that the government spending does not cause the national income, implying a unidirectional causality running from the former to the later. On other hand, the null hypothesis that the causation runs from national income to the government expenditure is rejected. Thus, the Granger causality test indicates only one a short-run unidirectional causality running from Government expenditure to the national income in Sudan, supporting the Keynesian paradigm, while the Wagner's view is refuted.

To examine the causal relationship between the variables in the long-run, we estimate the error correction model of equation (6) and (7). The results of error correction model between the variables are displayed in table 4. The table shows the error term coefficients, t-test value and the decision of the test.

Table 4: ECM results

Direction of Causation	ECMt-1	t-value	P-value	Decision
GE → GDP	-1.20	-3.40	0.0016	Do not reject
GDP → GE	2.00	2.8	0.0081	Reject

Similar to the Granger causality test, the result of error correction model indicates a unidirectional causality runs from government expenditure to the national income. As reported, the error correction term is negative and significant in the (national income on government spending) equation, but in the (government spending on national income) is positive albeit it's significant. Thus, this result suggests that for Sudan government expenditure causes national income in the long-run.

5. Conclusion and Policy Implications

This paper aims to examine the causality between government expenditure and national income in Sudan, using the traditional Granger causality test and error correction model. The results of both Granger causality test and error correction model (ECM) indicates a one directional causation running from government expenditure to national income, in both short and long-run. The significance of this result is that the increasing in government spending result in expansion of national income in Sudan. Therefore, the study supports the Keynesian proposition that public expenditure is an exogenous factor and important policy instrument for increasing of national income. On the other hand, the study does not advocate the Wagner's law, since no evidence of causation running from income to the government spending is found. The interpretation of this result is that government spending in Sudan is a decisive component of national income compared to private spending (consumption and investment). This finding also is consistent with the actual situation in most developing countries, where public sector is a leader one in stimulating economic growth and development, while the private sector is weak and suffering from the crowding out of public sector.

The main policy implication of this paper is that the government spending is one of the important policy tools to achieve the economic stabilization in Sudan. Therefore, policy makers should use government expenditure to expand the national income while keeping inflation at low levels. Also to avoid the unfavorable impact of public expenditure, government spending needs to be allocated for infrastructures and the promotion of productive sectors such as, agriculture and manufacturing. Moreover, the private sector should be enhanced through liberalization and privatization policies to play its effective role in the economy.

Finally, to provide a complete picture on the relationship between government spending and national income, this issue needs further research on the following directions. First, a study using disaggregated data on government spending would be useful to understand the nature of public expenditure in Sudan. Second, it would be important to test the complementarity and substitutability of government spending to private sector spending. Finally, to understand the origin of causality between government expenditure and national income, an empirical study needs to be conducted to identify channels through which government spending causes national income in Sudan economy.

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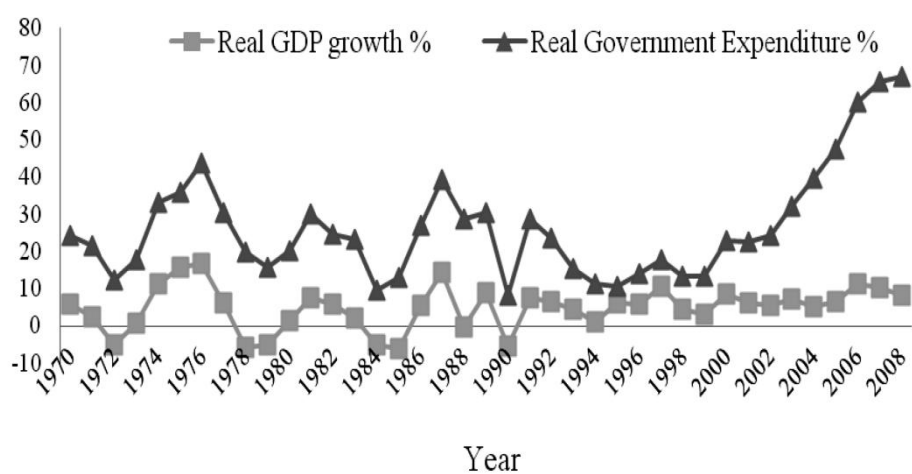
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Appendix

The plots of Real GDP growth and Real government expenditure, over the period (1970-2008).



Source: Central Bank of Sudan, Annual Reports.

The Challenges and Implications of Sustainable Development in Africa: Policy Options for Nigeria

Ogujiuba Kanayo¹, Ehigiamusoe Uyi Kizito and Udefuna, Patrick

The sustainable development debate is based on the assumption that societies need to manage three types of capital (economic, social and natural) which may be non-substitutable and whose consumption might be irreversible. Nonetheless, the problem of social and natural capital deterioration in Sub-Saharan Africa is quite alarming without sufficient response mechanisms. The paper examines the challenges and implications of sustainable development in Africa with a special focus on Nigeria. Using descriptive and analytical approaches, the paper posits that the prominent challenges which hamper the achievement of sustainable development in Africa include; extreme poverty, rapid population growth rate, rapid urbanization, deforestation, environmental impact of extractive industries, rate of economic growth, rural development, climatic variability and natural environmental hazard. The paper considers the implications of these challenges on post 2015 agenda in Africa and suggests plausible policy options to address social, economic and environmental sustainability. Since it was discovered that inconsistency in government policies among others things have impacted adversely on the sustainability of Nigerian development, the paper furthermore recommends the establishment of the Sustainable Development Trust Fund (SDF) saddled with the responsibility of enforcing economic, social and environmental sustainability.

1. Introduction

While Africa maintained positive growth rates during the 2000, very few countries have achieved and maintained the growth rates necessary to reduce poverty. African countries still face the critical challenge of raising the rate of GDP growth and sustaining high growth rates over an extended period in order to accelerate progress towards meeting the MDGs (ECA, 2007). Indeed, annual economic growth for 1990-2000

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averaged only 2.1 per cent, compared to the population growth rate of 2.8 per cent. The economic growth rate of the continent is less than the 7 per cent growth needed to reduce by half the proportion of Africans in poverty by 2015 (ECA, 2001a). However, African economies have continued to sustain the growth momentum of the early 2000s and recorded an overall average real GDP growth rate of 5.4 percent (ECA, 2007). Moreover, despite substantial progress in macroeconomic stabilization, deregulation, privatization, trade, and exchange rates reform, structural constraints and institutional weaknesses continue to inhibit a vigorous supply response, as most economies still depend on primary products, exhibiting a high export concentration. While 60 per cent of all exports from Africa are agricultural (66 per cent of which is unprocessed); they account for only 8 per cent of the countries' GDP.

One of the major challenges facing developing countries is to provide an equitable standard of living, adequate food, clean water, safe shelter and energy, a healthy and secured environment, and educated public, and satisfying job for present and future generations (Iganigan & Unemhilin 2011). Of all these necessities, the first and most basic to human life and survival is enduring food security: which may be defined as a situation in which majority of the populace of a country have access to domestically produced food at affordable prices at all times (Akinboyo, 2008). Historically, there has been a close correlation between economic growth and environmental degradation. As communities grow, so the environment declines. Unsustained economic growth has been starkly compared to the malignant growth of a cancer, because it eats away at the earth's ecosystem services which are its life- support system (Adams & Jeanrenaud, 2008). There is concern that, unless resource use is checked, modern global civilization will follow the path of ancient civilization that collapsed through overexploitations of their resource based (Diamond, 1997).

The crave for attainment of sustainable development has led to the development of various tools and measures for structuring and conducting sustainable development policy analyses. Most of these tools and measures emphasize the importance of frameworks that synchronize the principles and dimensions of sustainable development. This approach is not new. In the field of social sciences, the pioneer work of Bauer (1966), Biderman (1966) and Sheldon and Moore (1968) focused on frameworks for social development indicators. Their main purpose

was to define and measure social progress, and establish national goals and priorities. Human Development Index (HDI) which is a composite tool that measures the average achievement of a country in three dimensions; (a) longevity, (b) educational attainment and (c) the standard of living, is an important indicator. Since 1990, the Human Development Report has been ranking countries according to their achievements in human development (UNDP, 2000). Others are Human Poverty Index, Gender – related Development Index (GDI) and Gender Empowerment Measure (GEM). Rapid population growth continues to be recognized as creating a demographic poverty trap in the poorest countries, reflecting the impact of poverty on the ability to make investments, as well as the treadmill effect of the ever-increasing levels of expenditure required for the provision of basic social services (ECA 2005b)².

The concept of sustainable development also encompasses sustainable agriculture. This may be defined as consisting of environmentally-friendly methods of farming that allow the production of crops or livestock without damage to human or natural systems. More specifically, it might be said to include preventing adverse effects to soil, water, biodiversity, surrounding or downstream resources as well as to those working or living on the farm or in neighboring areas. Furthermore, the concept of sustainable agriculture, relates to passing on, a conserved or improved natural resource, biotic, and economic base instead of one which has been depleted or polluted. An "unsustainable situation" occurs when natural capital (the sum total of nature's resources) is used up faster than it can be replenished³. Inherently the concept of sustainable development is intertwined with the concept of carrying capacity.

Although sustainable development and urbanization are global challenges but the rapid urban expansion in Nigeria without effective environmental consciousness means that in virtually every urban center, a substantial proportion of the population is at risk from natural and human-induced environmental hazards. An assessment of the Nigeria's

² Human beings are both the creators and consumers of wealth. Therefore, it should always be put at the center of any discussion on sustainable development.

³ Sustainability requires that human activity only uses nature's resources at a rate at which they can be replenished naturally.

implementation of the United Nations Millennium Development goals showed that the goals pertaining to poverty alleviation and environmental sustainability and their application in Nigerian urban centers have not been adequately addressed. Consequently, the Nigerian City is far from achieving Sustainable Development (See Lawanson, 2006). Poverty, urban environmental hazards and urban public health, among others, are the major factors that pose enormous threats to the political stability, social cohesion and environmental balance of Nigeria's cities and until they are tackled decisively, sustainable urban development will remain a mirage. According to Danmole, (2002), many Nigerian cities are especially vulnerable to flooding, erosion and storm damage. Invariably, natural disasters in cities kill or injure members of low-income groups disproportionately because the poor often live in unsafe housing on vulnerable lands. The loss of homes, possessions, and often livelihood because of a natural disaster often leads to further impoverishment. Corruption is another major challenge to sustainable development in Nigeria. The phenomenon has continued to escalate like wildfire, and several factors which are responsible for the high profile corrupt practices in Nigeria are traceable to historical and cultural factors of the components that make up the country.

Consequently, several studies have been conducted on sustainable development in Africa (See Edward 1987, Pezzy, 1989, Pearce and Markandya 1989, Asheim, 1999, Hamilton 1999, and Dasgupta 2007). Most of these previous studies did not focus on the challenges and implications of sustainable development in Nigeria. But Nigeria being a country with the largest concentration of black race not only in Africa but also in the globe, presents a unique character. With a population of over 160 million people, anything that affects the Nigeria economy will surely affect the Africa continent because of the size and foreign policy objectives of the country. It becomes pertinent therefore to analyze the challenges and implications of sustainable development in Africa with special focus in Nigeria with a view to recommending policy options for Nigeria. This paper contributes to the debate on sustainable development by investigating the challenges and implications as well as recommend policy options for sustainable development in Nigeria. The paper is divided into five sections. The first section introduces the paper while section two reviews the theoretical and empirical literature. Section three analyzes the challenges of sustainable development in Africa, while the stylized facts about Nigeria in relation to sustainable

development are the discussions in section four. The final section of the paper contains the policy implications and options for Nigeria.

2. Brief Review of Literature

There have been several research studies on sustainable development. Edward (1987) used a Venn diagram to show that sustainable development has many versions such as economic, environmental and social sustainability. However, Pearce and Markandya (1989) criticized the Venn diagram approach due to the intractability of operationalizing separate indices of economic, environmental and social sustainability. They noted that the Venn approach was inconsistent with the Brundtland Commission Report which emphasized the interlinkages between economic development, environmental degradation, and population pressure instead of three objectives. Economists have since focused on viewing the economy and the environment as a single interlinked system with a unified valuation methodology (Hamilton 1999, Dasgupta 2007). Intergenerational equity can be incorporated into this approach, as has become common in economic valuation of climate change economics (Heal, 2009). Ruling out discrimination against future generations and allowing for the possibility of renewable alternatives to petro-chemicals and other non-renewable resources, efficient policies are compatible with increasing human welfare. Arrow et al (2004) and other economists (e.g. Asheim, 1999 and Pezzy, 1989 and 1997) have advocated a form of the weak criterion for sustainable development, the requirement that the wealth of a society, including human-capital, knowledge-capital and natural-capital (as well as produced capital) not decline over time. Others, like Barbier (2007) continue to contend that strong sustainability (non-depletion) of essential forms of natural capital may be appropriate. For many environmentalists, the idea of sustainable development is an oxymoron as development seems to entail environmental degradation. Ecological economist Daly (1991) has asked 'what use is a Sawmill without a forest?' From this perspective, the economy is a subsystem of human society, which is itself a subsystem of the biosphere and a gain in one sector is a loss from another.

Sustainable development is tripartite in nature. For sustainable development to occur it must reflect on the environmental, social and economic aspects of the country's life. Social, environmental and economic sustainability are discussed in detail below.

2.1 Social Sustainability:

This is one aspect of sustainable development. Social sustainability encompasses human rights, labor rights, and corporate governance. In common with environmental sustainability, social sustainability is the idea that future generations should have the same or greater access to social resources as the current generation ("inter-generational equity"), while there should also be equal access to social resources *within* the current generation ("intra-generational equity"). Social resources include ideas as broad as other cultures and basic human rights. Also we can speak of Sustainable Human Development that can be seen as development that promotes the capabilities of present people without compromising capabilities of future generations (Sen, 2000). In the human development paradigm, environment and natural resources should constitute a means of achieving better standards of living just as income represents a means of increasing social expenditure and, in the end, well-being (Anand, and Sen, 1996). The different aspects of social sustainability are often considered in socially responsible investing (SRI)⁴.

Social sustainability entails continuous improvement in the social well-being and quality of life. It focuses on social and human development indicators. The indicators examined include infant and child mortality, life expectancy at birth, maternal mortality, HIV prevalence rate, malaria prevalence rate, TB prevalence rate, population growth rate, total fertility rate, and rate of urbanization. Under social indicators, the following are examined - the percentage of a population living below the poverty line, adult literacy rate, primary and secondary school enrolments, percentage of population with access to improved sanitation, and percentage of population with access to safe water.

2.2 Economic Sustainability:

Economists have since focused on viewing the economy and the environment as a single interlinked system with a unified valuation methodology (Hamilton 1999, Dasgupta, 2007). Intergenerational equity

⁴ Social sustainability criteria that are commonly used by SRI funds and indexes to rate publicly-traded companies include: community, diversity, employee relations, human rights, product safety, reporting, and governance structure.

can be incorporated into this approach, as has become common in economic valuations of climate change economics (Heal, 2009). Ruling out discrimination against future generations and allowing for the possibility of renewable alternatives to petro-chemicals and other non-renewable resources, efficient policies are compatible with increasing human welfare, eventually reaching a golden-rule steady state (Ayong, 2001 and Endress et al 2005). Thus the three pillars of sustainable development are interlinkages, intergenerational equity, and dynamic efficiency (Stavins, et al. 2003). Economic Sustainability: Agenda 21 of UNESCO Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2005) clearly identified information, integration, and participation as key building blocks to help countries achieve development that recognizes these interdependent pillars. It emphasizes that in sustainable development everyone is a user and provider of information. It stresses the need to change from old sector-centered ways of doing business to new approaches that involve cross-sectoral co-ordination and the integration of environmental and social concerns into all development processes⁵.

2.3 Environmental Sustainability:

Environmental sustainability is the process of making sure current processes of interaction with the environment are pursued with the idea of keeping the environment as pristine as naturally possible based on ideal-seeking behavior. It refers to the maintenance of the integrity of different environmental media and systems to ensure that their functions and beneficial uses are upheld for present and future generations. Indicator of environmental sustainability include; CO₂ (Carbon dioxide) per capita emissions; methane emission in million metric tons; emissions of common anthropogenic pollutants; proportion of degraded land, forest area as a percentage of total land area; percentage of threatened species; percentage of water use; water stress and scarcity; and total fishery production. Assessment is done in an integrated manner in order to bring out the linkages between the different environmental themes on the one hand, and between the environment dimension and the social and economic dimensions of sustainable development. The themes cover

⁵ Furthermore, Agenda 21 emphasizes that broad public participation in decision making is a fundamental prerequisite for achieving sustainable development (Will, 2007)

the three environmental media namely: atmosphere, land and water. Also, the heavy dependence on natural resources led to resource depletion and environmental degradation and worsened the exposure of weaker economies to external shocks, thereby increasing poverty and reversing social development (World Bank, 2003)⁶.

Environmental preservation is an essential foundation for sustainable development and poverty alleviation. Failure to achieve biodiversity stability for instance will undermine social and economic development efforts. In this line, forests play critical roles in sustaining the health of the environment by mitigating climate change, conserving biological diversity, maintaining clean and reliable water resources, controlling erosion, protecting agricultural soils, providing low-cost and renewable energy and enhancing the urban environment (ECA-WA, 2010). Unfortunately uncontrolled exploitation of natural resources such as forests, land, water, and fisheries-often by the powerful few-have has caused alarming changes in our natural world in recent decades, thus harming the most vulnerable people in the world who depend on natural resources for their livelihood (Nyong, 2005).

3. The Challenges of Sustainable Development in Sub-Saharan Africa

The term sustainability reflects the need for careful balance between economic growth and environmental preservation. It generally means “meeting the needs of the present generation without compromising the needs of the future generations”. In its classic definition a development path is sustainable “if and only if the stock of overall capital assets remains constant or rises over time”. There are several challenges to sustainable development in Africa. They include:

(i) Poverty: Most developing countries across the globe are poor especially countries in Sub-Sahara Africa, Latin America and some parts of Asia. According to the 2007 African Economic Outlook (AEO), a publication of the African Development Bank (AFDB), African countries have been able to sustain GDP growth of 5.4 per cent over the

⁶ Many countries experienced reduced economic growth in the latter part of the 1970s and early 1980s and until recently the global economic recession had a devastating impact on world economies.

past five years⁷. However, political stability, good economic management policies and an improved institutional environment, have catalyzed the growth process in some countries. In spite of these economic trends, the scourge of poverty is still having a major impact on the Africa continent. The prospect of achieving the Millennium Development Goals (MDGs) in Sub-Sahara Africa by the target year 2015 remains bleak. Sub-Saharan African is by far the poorest region of the world. More than half of the population of Africa who live below two dollars per day is expected to rise to over 600 million by 2015. (Africare, 2008). Poverty is the foremost development challenge confronting Africa. It is linked to the environment in complex ways, particularly in natural resource- based African economies. About two-thirds of the population in Africa countries lives in rural areas, deriving their main income from agriculture. The poor strive to pursue livelihoods with few options outside what the natural resources available can offer. Trees are cut for fuel wood, land degrading farming system have been adopted, wildlife are being hunted to extinction, all in an effort to satisfy today's pressing livelihood needs. Unfortunately, these activities have not only worsened the situation of the poor living in Africa today, but they will also have implications for future generation to come (Africare, 2008).

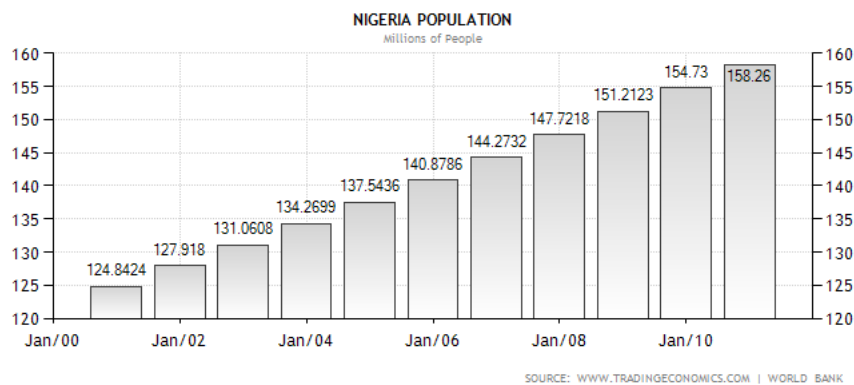
Africa's desire to achieve its development objectives through heavy reliance on natural resources and the implications this might have on the environment could potentially leave adverse footprints for future generations. Environmental destruction and high fertility go hand in hand, and they are both direct outgrowth of absolute poverty. For environmental policies to succeed in Africa countries, they must first address the issue of landlessness, poverty and lack of access to institutional resources. Insecure land tenure rights, lack of credit and inputs and absence of information often prevent the poor from making resource augmenting investments that would help preserve the environmental assets from which they derive their livelihoods. Hence preventing environmental degradation is more often a matter of providing institutional support to the poor than fighting an inevitable process of decay. (Todaro & Smith 2009). The need to prevent this situation is more critical than ever. That is why the time is ripe to renew

⁷This growth has been largely driven by a surge in prices of extractive resources especially Aluminium, Copper, Gold and Crude Oil.

the call for development that is both sustainable and ecologically – friendly for the African Continent as a whole in order to reverse some of the negative environmental and social trends

(ii) Rapid Population Growth: With a population growth rate of 2.5 per cent in Africa compared to 1.2 percent in Latin America and Asia according to the World Bank (2009), Africa's population may double in less than 30 years. This rapid population growth has put a lot of stress on Africa's ecosystem. Problems such as food security, land tenure, environmental degradation and lack of water supply are often related to high rates of population growth. Continuing on our present path of acceleratory environmental degradation would severely compromise the ability of present and future generations to meet their needs⁸. However the rate and timing of fertility declines, and thus the eventual size of world population, will largely depend on the commitment of governments to create economic and institutional conditions that are conducive to limiting fertility. Rapidly growing population has led to land, water and fuel wood shortages in rural areas and to urban health crises stemming from lack of sanitation and clear water. In many of the poorest regions in the globe it is clear that increasing population density has contributed to severe and accelerating degradation of the very resources that these growing populations depend for survival. To meet expanding LDC needs, environmental devastation must be halted and productivity of existing resources stretched further so as to benefit more people. If increases in GNI and food production are slower than population growth, per capital levels of production and food self sufficiency will fall. Ironically, the resulting persistence of poverty would be likely to perpetuate high fertility rates given that the poor are often dependent on large families for survival (Todaro and Smith 2009). Figure 1 shows the population of Nigeria between 2000 and 2011. The graph shows that Nigeria population has been experiencing astronomically growth since the last decade and this has great consequences on sustainable development in the country.

⁸A slowdown of population growth rates would help ease the intensification of many environmental problems.

Figure 1: Nigeria Population (in millions of people)

Sources: *www.tradingeconomics.com*, World Bank

(iii) Rapid Urbanization/ Urban Development: The majority of Africa's population growth is expected to take place in urban areas largely due to rural-urban migration. Rapid urbanization in Africa has been accompanied by new and challenging environmental problems. A sizeable proportion of urban dwellers in Sub-Sahara Africa live in slum conditions, without durable housing or legal rights to their land. At least one-quarter of African city dwellers do not have access to electricity. The World Health Organization (2002) reported that an estimated 43 percent of urban dwellers had access to piped water. After a decade, not much has changed. Waste disposal presents a tremendous health hazard in many urban areas. Clearly current patterns of urbanization are not consistent with the desire to have ecologically friendly sustainable development in Africa (Africare, 2008)

It is important to note that the rapid population increases accompanied by heavy rural-urban migration is leading to unprecedented rates of urban population growth, sometimes at twice the rate of national growth. Consequently, few governments are prepared to cope with the vastly increased strain on existing urban water supplies and sanitation facilities. The resulting environmental ills pose extreme health hazards for growing numbers of people exposed to them. Such conditions threaten to precipitate the collapse of the existing urban infrastructure and create circumstances ripe for epidemics and natural health crises. Congestion, vehicular and industrial emissions, and poorly ventilated household stoves also inflate the tremendously high environmental cost

of urban crowding. Lost productivity of ill or diseased workers, contamination of existing water source and destruction of infrastructure, in addition to increased fuel expenses incurred by people's having to boil unsafe water are just a few of the costs associated with poor urban conditions. Research reveals that the urban environment appears to worsen at a faster rate than urban population size increases, with the result that the marginal environmental lost of additional residents rises over time (Todaro and Smith, 2009)

(iv) Deforestation: There is a high degree of deforestation in Sub-Saharan Africa. This brings about loss of tree cover which has two potentially devastating environmental implications for predominantly poor rural populations. Deforestation can lead to a number of environmental maladies that over time can greatly lower agricultural yields and increase rural hardships. Clearing of vegetation at high elevations may increase the exposure of cultivated lands at lower attitudes. Soil that has been carried away by heavy rains may silt rivers and pollute drinking water. Plants help to retain rainfall, which percolates down through the soil into underground reserves of groundwater. The water in turn tapped by a variety of plants during dry seasons in arid regions⁹. The subsequent drop in the water level also leads to the death of plants with shallow root systems, including young trees (Todaro & Smith, 2009). According to the African Forest Forum (AFF) Africa has about 650 million hectares of forests and woodlands, covering 28 per cent of its total land area (FAO, 2001). The Congo Basin, which covers 45 per cent of Central Africa, is the world largest area of contiguous forest. Sadly the legacy of vast forest resources that could have been passed to future generation is being rapidly lost through deforestation and degradation. According to Africare, (2008), between 1990 and 2000, Africa lost about 53 million hectares of its forests, which is about 56 percent of the global forest loss in that period. This is translated to a 0.8 percent annual loss of forest cover -- the highest in the world¹⁰. A recent Africare study in Tanzania confirms that water catchment functions of the Kilimanjaro Mountains are being threatened by severe deforestation and land clearing for economic purposes to

⁹ A loss of vegetation leads to a decrease in the rate at which groundwater is replenished.

¹⁰ As the forest disappears, so too its contribution to the protection of soils, recycling of nutrients and the regulation of the quality and flow of water.

support the growing population on the Kilimanjaro Highlands (Africare, 2008).

(v) Environmental Impact of Extractive Industries: For a continent that is dependent on its natural resources to achieve growth, the challenge of ecologically-friendly sustainable development is daunting. Current patterns of extraction of non-renewable resources such as gold, diamonds and crude oil have had an untold impact on the environment. In Nigeria, oil spills and gas flares have polluted the environment significantly for more than 50 years. The 2008 target set to eliminate gas flaring was not achieved. In Southern Africa, abandoned mine sites have constituted an environmental menace. The loss of productive land, surface and groundwater pollution, and soil contamination are part of the legacies of oil and mineral exploration. Africa cannot afford the current approach to resource extraction. If the trend of unsustainable oil and mineral extraction is allowed to continue, environmentally sustainable development in Africa will continue to be a great challenge (Africare, 2008)

(vi) Climatic Variability and Natural Environmental Hazards: The Inter-governmental Panel on Climate Change (IPCC) study suggests that Africa will suffer greater effects of climate change than any other region of the world. Projections include the decrease in rainfall in the already arid areas of Eastern and Southern Africa, and increasing drought and desertification in the north of Central Africa. In West Africa, the countries of Benin, Burkina Faso, Ghana, Mauritania, Niger and Nigeria all shall face water scarcity by 2025 . Africa needs to step up its anti-climate change actions, as a legacy to future generations. However, not many African countries have this as a top priority in view of the pressing development challenges being confronted by the African continent such as HIV/AIDS, malaria and low agricultural production (Africare, 2008). The Report released by IPCC in 2007 shows that Sub-Saharan African can expect major consequences from Global warming involving larger and more severe heat waves, hurricanes, floods from heavy rains, prolonged droughts, losses of valuable species of crops and fishes losses. Sub-Saharan Africa is vulnerable to and will be hit particularly hard, by greenhouse gas-induced climate change. The IPCC report concluded that by 2020, agricultural production, including access to food, in many countries and regions in Africa is projected to be severely compromised by climate variability and change. The area

suitable for agriculture, the length of growing seasons and yield potential, particularly along the margins of semi-arid and arid areas, are expected to decrease. This would further adversely affect food security, and exacerbate malnutrition in the continent. In some countries, yields from rain-fed agriculture could be reduced by up to 50% by 2020. The study projected that 75 to 250 million people in Africa will be exposed to increased 'water stress due to climate change' by 2020. Coastal fisheries, mangroves, and coral reefs will be further degraded and threatened by projected rises in sea level and storms. Fresh water lakes will also be negatively affected (Todaro & Smith, 2009).

(vii) Rate of Economic Growth: Evidence indicates that the very poor cause considerable environmental destruction as a direct result of their poverty. It follows that increasing the economic status of the poorest group would provide an environmental windfall. However as income and consumption levels of everyone else in the economy also rise, there is likely to be a net increase in environmental destruction. Meeting increasing consumption demand while keeping environmental degradation at a minimum is not a small task (Todaro & Smith, 2009). The GDP growth rate in Nigeria has grave impact on sustainable development in the country. The growth rate is shown in figure 2 below.

Figure 2: Nigeria Gross Domestic Product (GDP) Quarterly Growth Rate (in Percentage).



Sources: www.tradingeconomics.com, National Bureau of Statistics (NBS)

4. Stylized Facts about Nigeria

Nigeria is an agrarian country with about 70% of her over 140 million people engaged in agricultural production. The country is also generally endowed with abundant natural resources and the livelihood of more than half of the economically active population in Nigeria directly depend on the environment through agriculture, as well as animal husbandry ,hunting, fishing, forestry, and foraging. This alone underscores the importance of the seventh Millennium Development goal: to ensure environmental sustainability (Todaro & Smith). However, several challenges threaten progress towards sustainable development goals in Africa especially Nigeria. The spike in food and energy prices in 2008 led to a severe food crises. The subsequent fall of energy prices has eased some of the pressure on energy importing countries. Yet, food prices remain high. The global financial and economic crisis in 2009 has exacerbated the situation. Growth rates are falling, unemployment is rising, poverty is deepening, hunger and malnutrition are on the increase again, and the achievement of the millennium Development goals are in jeopardy.

Economic sustainability in Nigeria is maintaining and sustaining a high real growth rate of the economy to achieve the Millennium Development Goals (MDGs). Nigeria's economy performed reasonably well in the 1960s and early 1970s but did poorly in the following two decades. However, since the late1990s, the economy has picked up. But the recovery's sustainability is fragile for two reasons. First, strong domestic savings do not underpin it. Second, Nigeria's economy remains vulnerable to outside shocks (ECA 2001a).

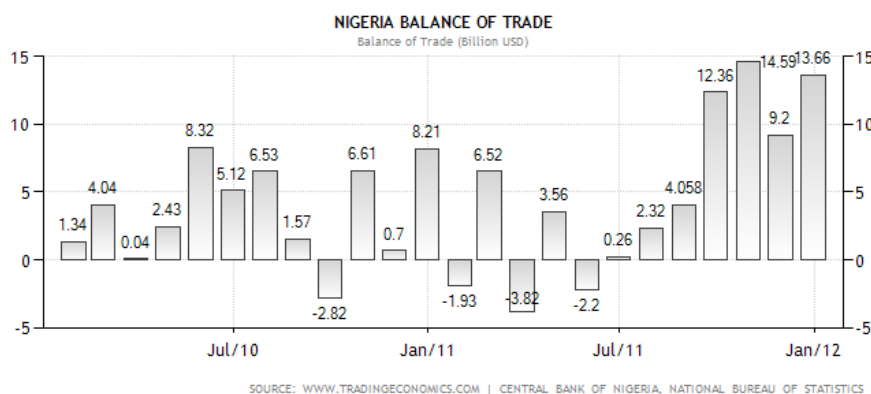
In this section, the status of Nigeria's economic sustainability (as an important component of sustainable development) is reviewed by examining key indicators. These indicators include growth rates of GDP, balance of payments, exports and imports; savings and investments; agriculture, manufacturing, debt and the structure of the economy

Table 1: Nigeria – National Statistical Data 2011

	2011	2010	Unit
Balance of Trade	13.66	9.20	Billion USD
USDNGN- Naira Exchange rate	151.48	154.57	
Current Account	8140.00	4737.00	Million USD
Current Account to GDP	13. 30	13. 00	Percent
USDNGN Exchange Rate	162.91	163.05	
Exports	17.01	12.10	Billion USD
GDP	193.67	186.57	Billion USD
GDP Annual Growth Rate	7.68	7.40	Percent
GDP Growth Rate	7.68	7.40	Percent
GDP Per capita	540.34	513.77	USD
GDP Per capita PPP	2380. 62	2245.38	USD
Government Budget	-2. 96	-6. 80	Percent of GDP
Government Debt to GDP	17. 90	18. 00	Percent
Imports	3. 35	2. 89	Billion USD
Inflation Rate	12. 90	12. 10	Percent
Interest Rate	12. 00	12. 00	Percent
Population	158. 26	154. 73	Million
Unemployment Rate	23. 90	21. 10	Percent

Source: Trading Economics, (<http://www.tradingeconomics.com/nigeria/indicators>)

Nigeria reported a trade surplus equivalent to 9.2 Billion USD in December of 2011. Historically, from 2002 until 2011, Nigeria Balance of Trade averaged 2.5800 Billion USD reaching an all time high of 14.5900 Billion USD in October of 2011 and a record low of 3.8200 Billion USD in March of 2011. Exports of commodities (oil and natural gas) are the main factor behind Nigeria's growth and accounts for more than 95% of total exports. Nigeria's main exports partners are: USA (30% of total in 2009), Equatorial Guinea (8%), Brazil (6.6%), France (6%) and India (6%). Nigeria imports mainly: industrial supplies (32% of total), transport equipment and parts (23%), capital goods (24%), food and beverage (11%) and consumer goods. Main import partners are: China (17% of total), Albania (11.3%), United States (7.5%), France and Belgium. Figures 3 and 4 show the Nigeria Balance of trade and inflation rate, respectively.

Figure 3: Nigeria Balance of Trade (in Billion USD)

Sources: *tradingeconomics.com*, *Central Bank of Nigeria (CBN)*, *National Bureau of Statistics (NBS)*

Figure 4: Inflation Rate in Nigeria (Annual Change on Consumer Price index)

Sources: *tradingeconomics.com*, *Central Bank of Nigeria (CBN)*,

According to the National Bureau of Statistics the table below presents the percentage of non-poor, moderately poor and extremely poor Nigerians, as it were in the 1980s, through 1990s to 2010. On Monday, February 13th, 2012, the National Bureau of Statistics opined that 112.519 million Nigerians which are 71.5% of the nation's population live in relative poverty conditions (Punch, Tuesday, February 14th, 2012; Nigerian Tribune, Monday, February 13th, 2012).

Table 2: Relative Poverty: Non-Poor, Moderate poor and the Extremely Poor (%), 1980-2010

Year	Non-poor	Moderately poor	Extremely poor
1980	72.8	21.0	6.2
1985	53.7	34.2	12.1
1992	57.3	28.9	13.9
1996	34.4	36.3	29.3
2004	43.3	32.4	22.0
2010	31.0	30.3	38.7

Source: NBS, *Harmonized Nigeria Living Standard Survey, 2010*

According to the National Bureau of Statistics data, the above captures the results of living standards of Nigerians. About 100 million Nigerians now live on less than one dollar a day. For a country to lay claim to sustainable development, its economic growth and infrastructural development must have positive impact on the well being or the livability of the majority of its population. On the contrary, environmental degradation emanating from harmful industrial emissions, unemployment and poverty has steadily been on the rise in the face of the supposed economic growth.

4.1 Effects of Unsustainable Development in Nigeria

Despite the contributions of international multinational, bilateral and non- governmental organizations to the development strides in Nigeria, it appears that the more assistance the country gets the higher the poverty, unemployment and conflict levels. The country's population is growing at geometrical progression without corresponding growth in basic infrastructure and social amenities such as electricity, good roads, potable water, health, educational facilities. The real sector of the economy is comatose with low capacity utilization in the industrial sector, underdevelopment agricultural sector and ailing transport sector. The cities are congested due to high rural-urban migration and poor urban planning and most citizens who could no longer bear the congestion associated discomforts had either legally migrated to developed countries or sought asylum. Analysts have been asking what

had happened to resources generated from oil and gas productions as well as the financial assistance from many international organizations to Nigeria. With external and domestic debt profile as at March, 2013 put at \$6.670 billion and N6.493 trillion, respectively, (by the Debt Management Office, 2013) the future of the country is seen by many as uncertain. Furthermore, the dependence on petroleum as the major source of government revenue and its attendant effects on the economy pose more concern for many analysts. This is so, especially with the declining world demand for crude oil in the face of increasing supply due to the discovering of crude oil by many countries in recent times. In addition, the country is characterized by widespread corruption in public offices, mismanagement/misapplication of project funds, low execution capacity, lack of political will, insecurity and insincerity on the part of both the govern and the governed. The pervasiveness and spontaneity of the global urbanization process has been an issue of concern in recent time because this essentially constitutes serious challenge to the attainment of sustainable development and effective urban governance. The implications of sustainable developmental challenge in many African nations, including Nigeria are diverse socio-economic, cultural and environmental problems. Addressing these urban developmental challenges in Nigeria requires effective and good governance. There is the need to examine these developmental issues in order to provide a rationale for good governance in the management and utilization of existing resources for sustainable urban growth in Nigeria. Nigeria is blessed with natural resources especially hydrocarbons. Managing proceeds of resources to develop rural communities had created several conflicts. The effects of unsustainable development in Nigeria include:

(i) Extreme poverty and hunger: Indeed, Nigeria presents a paradox. The country is rich with both human and material resources, yet the people are poor. Per capital income today is still almost the same level as in 1970. Poverty in Nigeria encompasses a very complex society: regional climatic and ethnic differences are reinforced by different historical and socio-economic legacies (World Bank 1996). The country has had a complex political history. Political instability has led to sharp changes in economic and social policies, which have impacted adversely on the population and have worsened income distribution. To achieve sustainable development, “continuity in government” tradition must be in place. However, this is lacking in Nigeria. The challenge for Nigeria

is not one of improving one sector or region at the expense of another or of introducing policy distortions and inefficiencies in resource allocation to benefit one sector/ class which in the past has led to increased poverty for others, but to adopt growth and social service oriented policies that will avail the Nigerians the opportunity to improve their welfare.

In the early 1960s, the basis of the country's economy was a well-diversified agricultural sector that absolved 75 percent of the nation's population, accounted for over 68 percent of GDP, 78 percent of exports and 94 percent of the nation's food supply. Within the period, per capita income stood at US \$90 and GDP growth was rapid at an annual rate of nearly 5 percent (see World Bank, 1996; Nwaobi, 2003). However, a new development pattern gradually emerged (over the years) as agriculture began to stagnate due to the growing burden of taxation. Rapidly growing industries later started to exert enormous influence on the economy, in the form of demands for special protection from imports. The foregoing resulted in the pattern of industrialisation, from processing of agricultural products for export, towards import substitution and the emergence of petroleum extraction as the main-stay of the economy (i.e. the leading growth sector). But in the mid-1960s growing regional tensions and the identification of the political parties with rent seeking, ethnic interests and patronage created a climate of unrest and political uncertainty that was compounded by the stagnating GDP growth (Nwaobi, 2003). Other events such as the civil war, military interregnums, institutionalization of corruption etc. caused major loss of production. There was an unprecedented drop in foreign exchange earnings and government revenue traceable to the decline in on-shore oil production. The poverty reduction programme of government is a progressive step towards economic and social sustainability. However, the success of the programme in addressing poverty is still questionable; more so as the incidence of poverty continues to rise.

Poverty is very real in Nigeria, over the last ten years; the quality of life of the average Nigerian citizen has progressively nose-dived. It is so endemic that people have started seeing it as part of their lot in life (Barnes, 2010). In fact, scores of research studies have exposed the dimensions and the extent of poverty in Nigeria. For example Obadan and Odusola (2001), reveal how sharply the per capita income of Nigerians slipped from a high of over 1,280 dollars in 1980 to a low

dollar in 1995. Nonetheless, this is still below 2 dollars by 2010 reports of the NBS. This and other studies generally paint a grim picture of a nation trapped in a vortex of abject and abnormal poverty and declining productivity. Available statistics indicate how precarious life has become for the average Nigerian over the years in the face of suffocating levels of poverty. The Nigeria poverty level is further compounded by the ratio of debt to GDP in the country as show in figure 5 below

Figure 5 Nigeria Government Debt to GDP from 2000 to 2012



Sources: www.tradingeconomics.com, International Monetary Fund

(ii) Fall in Quality of Education: The standard of education in the country is falling by the day despite all the efforts being made by successive governments and administrations. Experts are of the opinion that policy inconsistency is the root cause of this phenomenon. Howbeit, Further, Sheikh Ahmed Lemu argued;

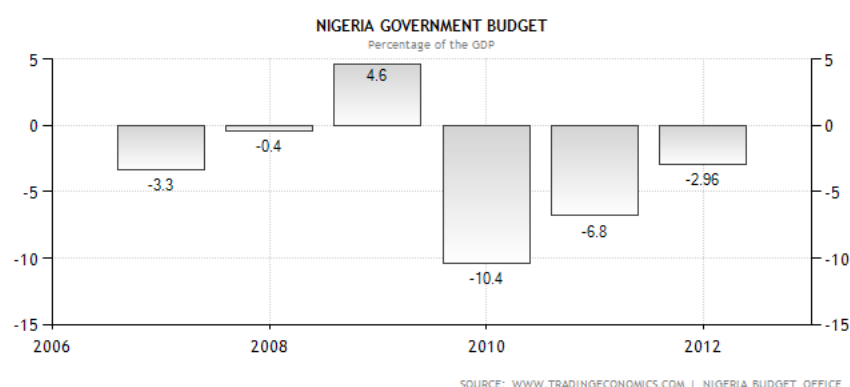
But the major problem of the sector is that of policy inconsistency. Every government wants to introduce its own policies. Though these policies sometimes are beautiful and fantastic and if well implemented would have been able to move the sector forward (Lemu, 2012).

But one of the major problems is that of lack of effective preparation and necessary components that will make such policies work. As long as there is dearth of qualified manpower and learning facilities and also poor teaching, it will be difficult for any policy on education no matter how good and laudable it is to achieve significant result. It will only end up as a wishful thinking. Lemu further posited that;

What brought about the bad and ugly in the education sector up till today cannot be divulged from political terrain. Many politicians have no love for the nation at hearts. They are only after money they will use the position to make for themselves. They are also after people who will be running after them irrespective of whatsoever they do with their positions. So, those at the helm of education affairs of the country are also not left out from the blame.

Besides, the state of education in Nigeria is not unconnected to other issues such as the government budget as a ratio of GDP as shown in figure 6 below.

Figure 6: Nigeria Government Budget as a percentage of the Gross Domestic Product (GDP)



Sources: www.tradingeconomics.com, Nigeria Budget Office

(iii) High Maternal and Child Mortality: Nigeria's maternal mortality rate is at an unacceptably high level. It is estimated that one in eight women die yearly of pregnancy-related complications. Nigeria has the second highest rate of maternal death in the world (Terence McCulley, 2012). The same is applicable to children. Despite Nigeria GDP per capita which has been on the increase since 2000, this trend still continue. Figure 7 shows the Nigeria GDP per Capita in USD at Constant prices since 2000.

Figure 7: Nigeria GDP per capita (in USD at Constant prices since 2000)

Sources: www.tradingeconomics.com, World Bank

(iv) High Prevalence of HIV/AIDs, Malaria and other diseases: The major contributors to the disease burden of the country are malaria, tuberculosis (TB), and HIV/AIDS. Unarguably, Nigeria has taken various progressive steps to contain these diseases. They include among others, the National Agency for the Control of AIDS (NACA), National Health Insurance Scheme (NHIS), yet the incidences of these have been so rampant. Malaria is a major health and developmental problem in Nigeria, with a prevalence of 919 per 100,000 populations (WHO 2002). The HIV/AIDS epidemic has unfolded on a large scale in Nigeria: adult prevalence is 3.9 percent and nearly 2.9 million people are living with the virus (UNAIDS 2006). Tuberculosis cases have increased dramatically with the onset of HIV/AIDS in the country, with an estimated prevalence of 546 cases per 100,000 populations in 2004 (National Human Resources for Health Strategic Plan, 2008 to 2012, July, 2007)

(v) Environmental Unsustainability: Nigeria gradually degenerated into a mono-cultural economy heavily dependent on petro-dollar. The implication of the environment became enormous, as ecosystems and biodiversities were destroyed by the activities of extractive industries. These industrial activities, with their potentials for environmental degradation and pollution were carried out in an uncontrolled manner, leaving a legacy of:

- ✓ Deterioration of health quality and generation of health hazards

- ✓ Destruction of flora and fauna
- ✓ Pollution of water resources
- ✓ Air and noise pollution
- ✓ Destruction of traditional economic infrastructures within communities hosting some of these high powered investments (Ifeanyi, 2012).

Policies aimed at integrating development programmes with environmental issues at planning stage were non-existent. Governments focus was maximum exploitation of natural resources for rapid development with scant regard for resource conservation and sustainability.

(vi) Gender Inequality: Gender inequalities within the overall society, and across all sectors, reflect the wide disparities between women and men which, in turn, contribute to uneven development and the feminization of poverty. Among the 70 percent of the Nigerian population estimated to be living below poverty line, over 65% are projected to be women. Income and purchasing power is estimated to be US\$1,495 for men as compared to US\$614 for women and men have greater access to high-paying, secure employment. For example, 76% of Federal Civil Service workers are men, whereas women make up 24% of the workforce and occupy less than 14% of the overall management positions, despite the appointment of women to the position of permanent secretaries (beginning in 2000 and in line with affirmative action initiatives). Additionally, approximately 17.5% of medical doctors are women whereas 82.5% are men. These disparities have a significant impact on the capacity of women and men to contribute to the economic growth of the country, the reform agenda, and efforts to reduce dependency ratios within family units and achieve the desired value-re-orientation goal of government. Other indications of gender inequalities include disparities in participation within the formal sector which stands at 87% men with 11% women compared to 30% men engaged in the industrial sector. The extractive industry with annual business volume of over US\$42m has almost zero level participation of women. (CIDA Nig. GSAA 2006).

5. Policy Implications and Options for Nigeria

The Nigeria's government has never been in short supply of policies, programmes or reforms aimed at alleviating the challenges confronting the economy and the livelihood of its citizens. But what is usually in short supply is the political will to successfully implement these policies and programmes to tackle these challenges. It has been argued that commitment to sustainable development both for the present and future generations will be meaningless if collaborative approach is not employed. This is where Nigeria differs from other countries in Africa in the approaches of addressing the challenges of sustainable development. For instance, several policies put in place to address the challenges of sustainable development in Nigeria since the 1980s include; Structural Adjustment Programme (SAP), Poverty Reduction Programme, the National Economic Empowerment and Development Strategy (NEEDS), State Economic Empowerment and Development Strategy (SEEDS), National Directorate of Employment (NDE), etc. These policies fell short of expected standard needed for sustainable development that will substantially ameliorate the impact of poverty, unemployment and income inequality on the citizens.

The central focus of the strategy is on poverty reduction, alongside sectoral policies on environmental management, sanitation, water, health and population. Issues of good governance and improved popular participation in governance and partnership with national and international development partners are also being mainstreamed into national agenda for development (Oladunjoye, 2005). Onakuse & Eamon, (2007) argued that the major causes of the failure of these programmes and reforms hinge on corruption, political divide, lack of continuity, a weak private sector, dearth or absence of due process, and ethnicity. Other pitfalls that usually confront government policies include absence of consistent enabling framework on finance, funding and infrastructure on small and medium enterprises: inadequate transportation networks and power supply that support development effort and delivers multiplier effects on other sector within the country. Weak institutional/market infrastructure to guide business activities and enforce contract and commercial transactions: lack of transparency and good corporate governance related matters: non-adherence to accountability, and perennial misappropriation of public funds: and unpredictability of the political and social environment are other factors

militating against the success of government policies on poverty reduction and sustainable development. (Onakuse & Eamon, 2007).

The above arguments portend important policy implications for the country, especially when understood that Nigeria has been struggling to attain sustainable development, by ensuring economic, social and environmental sustainability. There has been growing concerns over the growing rate of environmental threats of desertification in the North, devastating hydraulic coastal erosion in the East, Environmental pollution and degradation emanating from oil exploration in the South – South and high level of flooding in the West. And if serious and urgent steps are not taken by the Federal Government, the country stands the risk of being choked by these environmental hazards. Environmental conditions in cities have deteriorated greatly due to the rapid growth of the cities and the attendance lack of capacity of existing social services and infrastructures to adjust to the rate of growth. Inadequate storm drains, dumping of refuse in drainage lines and construction of houses close to and even on the natural water channels have been shown to be responsible in that order for the increasing cases of flood in the urban centers. Environment problems associated with the increasing growth of urban slums including overcrowding in squalid housing conditions, poor quality or unavailability of basic infrastructures and social services, such as water and sewage facilities and even lack of access routes (NEST, 1992). Under such stressful situation, it will be easy for people to become so exigent worrying only about what to get out of the environment for their own immediate needs and uses, without caring very much for the consequence, especially for succeeding generations (Mabogunje, 1985).

The need to ensure sustainability in Nigeria calls for the formulation and implementation of new policies and programmes that will reinforce the old ones which largely apply the principle of sustainable development advocated by the Commission on Environment and Development – whereby, developmental efforts are not only concentrated on solving present problems but also consider future challenges and needs (Ajiboye, 2011). The policy options available for Nigeria to tackle the challenges of sustainable development based on the policy implications explained above are numerous. Firstly, and central to the issue of achieving sustainable development is the need for good governance. This should be in accordance with the principles entrenched in the

United Nations global Agenda 21 which seek to employ sustainable development strategies to integrate all aspects of development socially, economically, culturally and environmentally in achieving distributional equity and providing adequate social services including health, education, housing as well as functional and liveable environment among many others (Ajiboye. 2011).

Secondly, policies and programmes designed to address the challenges of sustainable development should be comprehensive by integrating all stakeholders. There should be greater involvement and participation of Non-Governmental Organizations (NGOs), Civil Society organizations (CSOs) and community groups in local governance, greater transparency and accountability in both planning and implementation of local policy and the devolution of responsibility for urban affairs from state or national level to the local level are inevitable, as the challenges of sustainable development can only be dealt with in an atmosphere of peace, better leadership (devoid of corruption) and freedom, especially in a politically frayed and frazzled continent as Africa. Similarly, there is a need for improved collaborative efforts by all governmental Agencies at regional, national and local levels towards ensuring good governance and sustainable development. The New Partnership for Africa's Development (NEPAD) is an initiative for speeding up sustainable development in Africa. Other counterpart initiatives which operate at the national state and local government levels in Nigeria should collaborate to ensure speedy actualization of the UN Global Agenda 21 and Goal 7 of the MDGs Agenda on the sustainability of the environment.

Thirdly, Nigeria could go the way of Europe by establishing the Sustainable Development Trust Fund; the policy trust could be to establish a national body/ agency with a management tool and point of reference that will help it assess the progress that is being made in mainstreaming sustainable development in the three-partite aspects of Nigeria's national life. The wisdom behind the establishment of the Sovereign Wealth Fund is laudable as it strives to retain some funds for the nation's future generation, but it did not make provisions for social and environmental sustainability. The aims and objectives of the plan could be patterned in a manner to help ensure that the Nigeria sustainable development programmes comply with structural fund

regulatory requirements concerning sustainable development and the environment.

Fourthly, there is also the need for urban regeneration and enhanced infrastructural development. As the population of an urban centre increases, its need for infrastructure such as transportation, water, sewage and facilities such as housing, commerce, health, schools, recreation and others increases (Ujoh et al., 2010); therefore, increasing the environmental carrying capacity of the urban areas is necessary for enhancing the liveability of cities in Nigeria. Massive rehabilitation and expansion of urban infrastructure in the country should be taken more seriously. This should be done to address the challenges of urbanization, urban governance, land management and shelter in Nigeria. The issues of poverty (rural and urban) and sustainable urban cities should continue to receive the attention of the government, just as the political will and commitment to formulate and implement programmes and policies for development planning, housing, infrastructural development and urban management should be accelerated.

Furthermore, the government can fulfill its commitments to promoting sustainable development through a dual approach to mainstreaming. Ultimately, the mainstreaming approach should help ensure certain key strategic priorities such as promoting work and skills which are delivered in a way which minimizes any negative impacts on the economy, social and environment by Sustainable Development Trust Fund (SDF). This should also maximize positive impacts. In addition, the mainstreaming approach should help to support a number of environmental projects which promote jobs or skills. In the operational context of SDF, sustainable development could be seen as development which provides opportunities to allow everyone fulfill their potentials, social justice, environmental protection and the skills that businesses demand and require – now and in the future. (European Social Fund Sustainable Development Mainstreaming Plan for England and Gibraltar 2007-2013).

Finally, the proposed SDF with strategic aims should promote jobs and skills and target those with greatest need. These aims help to ensure that two of the three strands of sustainable development described above are at the forefront of the programme (with employment as a route out of poverty and the provision of skills training to support and sustain

business). Legal and regulatory requirements concerning the promotion of equality and human rights also help to reinforce the social justice strand. Given that two of the three strands of sustainable development are inherent to the focus and delivery of the sustainable development programme, the main focus for sustainable development mainstreaming work in the proposed programme should be on promoting the third strand of environmental protection and enhancement. There should also be environmental sustainability providers who are required to consider how they deliver their services in terms of trying to reduce negative impacts and increase positive impacts on the environment. The body should as well prepare environmental sustainable development policies; and prepare and deliver sustainable development implementation plans which turn the sustainable development policy commitments into action.

5.1 Conclusion and Recommendation

The crux of these concluding remark is the implicit proposal that the responsibility for social, economic and environmental sustainability lies with federal governments (and Nigerians), which would enable development to be adapted more readily to the Nigeria's economic and social conditions. The implication of the absence of this political will and support all too often opens up Nigeria's social, economic and ecological heritage to external conditions - leading to system's vulnerability. Experts are of the opinion that environment is key to sustainable development; Brookfield (1991: 62) further opined that;

“Undoing unsustainable and building sustainability in its place will be an enormous task, against great opposition, and made much worse by uncertainties, aggravated by human action, with which we have to live in forceable future. It is further made worse by the widespread distrust of government. We need to pay attention to the past and to the immense fund of knowledge possessed by resource managers on the ground... the political economy within which resource management takes place is of fundamental importance, and if that continues to be based on the license to exploitation and greed, nothing improves”

Far reaching reforms at the state and federal levels are indispensable in achieving sustainable development and, in Nigerian context; a significant measure of intervention cannot be avoided. Rather than be informed by misguided economic and ecological idealism, as well as

policy inconsistency, Nigeria's political economy needs to be dictated by what is necessary, what is possible and its financial implications, required institutional frameworks, and in terms of shared social responsibility, to achieve a sustainable future. The implication is multifaceted/ interdisciplinary and collective approach which is essential to any social action, no less the sustainability of Nigeria's development efforts.

The sustainable development trust fund proposed in this work is a progressive attempt towards achieving sustainable development in the country. This institution framework, if established will oversee and enforce policy consistency, and judicious spending of the public fund. It will also ensure human capital development, diversification of the economy and enforce environmental laws.

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