



Environmental Sustainability and Job Creation – A Critical Symbiosis for Growth in Nigeria

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ABSTRACT

As concerns grow over climate global warming and other ecological hazards, regulations and environmentalists around the world have intensified their clamp down on irresponsible waste disposal practices. Reuse and recycling of waste materials have become the preferred options. Thanks to ever improving waste management technologies and innovations, virtually everything is now recyclable – cell phones, computers, plastics, organic wastes, nylon, glass, food waste, furniture, vehicles, green waste, paper, water, wood, metal, construction wastes, clothing, jewelries, household electronic appliances, among others. In this paper, the authors articulated potent argument why developing countries should leverage on the vast opportunities that abound in waste management to create jobs/wealth for the teeming population of unemployed youths and at the same time promoting environmental sustainability. Using descriptive analysis and with an analytical spotlight on Nigeria, the authors averred that effective waste management such as recycling presents great opportunities not just to manage our environment better but also to create wealth for the world's growing population. For the discerning and innovative entrepreneurs, waste management creates multiple channels of economic gains that should not be ignored.

Keywords: Waste Management, Environmental Sustainability, Municipal Solid Waste, Reuse, Recycle

INTRODUCTION

How to effectively manage Municipal Solid Waste (MSW)¹ and create jobs/wealth for the teeming unemployed youths are unarguably two major problems that have continued to plague most cities in developing countries including Nigeria. Extant literature on MSW management shows that there is an overall correlation between the generation of solid wastes; wealth creation and urbanization (see Veolia,

¹Municipal solid wastes (MSW) is often described as the waste that is produced from residential and industrial (non-process wastes), commercial and institutional sources with the exception of hazardous and universal wastes, construction and demolition wastes, and liquid wastes (water, wastewater, industrial processes) (Tchobanoglous & Kreith, 2002). In Nova Scotia, MSW is defined through the *Solid Waste-Resource Management Regulations* (1996) which state that MSW “..includes garbage, refuse, sludge, rubbish, tailings, debris, litter and other discarded materials resulting from residential, commercial, institutional and industrial activities which are commonly accepted at a municipal solid waste management facility, but excludes wastes from industrial activities regulated by an approval issued under the Nova Scotia *Environment Act*” (SWRMR, 1996).

2006; Spiegelman, 2006; Sinha, 2010; Snow & Dickson 2011). How to effectively leverage on solid waste management to create jobs and wealth have so far eluded most cities in developing countries including Nigeria. In consequence, cities in most of the developing economies of Asia and Africa are on the verge of being over-run by wastes while unemployment, especially youth unemployment, continues to soar. An effective management of solid waste could be the master stroke that will lead to environmental sustainability and at the same time creating jobs and wealth for these economies.

Waste is a trash or junk that is no longer needed. It is, in fact, a nuisance – but one that can be easily leveraged to generate massive wealth and ensure environmental sustainability (Spiegelman, 2006; Sampson, 2014). Managing the wastes generated by others has become serious business and the growing prospect arises mostly from the increasing realization that virtually all manner of wastes can now be ‘fixed, refurbished, recycled and reused for same or other purposes’ (Sampson, 2014). Municipal waste management has created several multi-billion dollar business empires around the world and is gradually becoming a major global economic sector (University of Sunshine Coast, 2010; Snow & Dickinson, 2011). It is also proving to be highly elastic industry with room for various categories of players and compelling innovation and technological advancements. Interestingly too, the waste management sector remains a safe haven for discerning investors. Due to the indispensability of its services, demand is hardly ever adversely affected by turbulent economic conditions (UNEP, 2011). In the UK for example, at the height of the global economic recession in 2009 when several companies in key sectors declared bankruptcy and got placed under administration, the country’s waste management sector recorded about the lowest rate of insolvency, with less than one percent of its business suffering financial turbulence (Sampson, 2014). Moreover, municipal waste is ever increasing. It is estimated that the quantity of municipal solid waste (MSW) generated worldwide annually is 1.7-1.9 billion metric tons (UNEP, 2010). In many cases, these wastes are not well managed especially in developing countries, as cities and municipalities cannot cope with the accelerated pace of solid waste production (Veolia Environmental Services, 2006 Timlett & Williams, 2009). Indeed, waste collection rates are often lower than 50 percent in low income countries and more than 70 percent of the collected waste is often disposed of through uncontrolled land-filling and about 15 percent is processed through unsafe and informal recycling (Chalmin & Gaillochet, 2012).

The problem of effective solid waste management is more severe in low income economies especially Africa and Asia due to widespread poverty and poor funding of public services like waste management. Establishing and improving facilities for collection, recycling, treatment and disposal for MSW management can be very costly. For example, building and operating sanitary landfills and incineration plants require huge investments and incur substantial operation and maintenance costs (Townend, 2010). Furthermore, it is becoming increasingly difficult to find suitable locations for waste treatment facilities due to the prevalence of the “Not in my backyard attitude” among communities (UN-Habitat, 2010:34). Moreover, if waste is growing at 3-5 percent a year and rural-urban migration increases a city’s population at a similar rate, then a city’s waste generations will double every 10 years (UN-Habitat, 2010).

It becomes imperative that cities, especially those cities in low income countries, are encouraged to pursue the paths of integrated solid waste management and Reduce, Reuse and Recycle (3Rs) that places highest priority on waste prevention, waste reduction, and waste recycling instead of just trying to cope with ever-increasing amounts of waste through treatment and disposal (US-EPA, 2008; Tuclor et al., 2009). Such efforts will help cities to reduce the financial burden of waste management, as well as reduce the pressure on landfill requirements (US-EPA, 2005). For a developing economy like Nigeria, effective solid waste management could also be leveraged upon to create jobs for the huge teeming unemployed youths thereby ‘killing two birds with one stone’

In this paper, analytical spotlight is placed on solid waste management and how it can be leveraged upon to create jobs/wealth and at the same time promote environmental sustainability. The paper reviewed how

integrated solid waste management could be leveraged upon to create jobs and at the same time, promote environmental sustainability. Finally, the paper looks at the processes and options that are available in waste management business for the discerning investors.

Review of Solid Waste Management Practices

Conventional waste management focuses largely on waste collection, treatment (composting and incineration) and disposal (landfills) (US-EPA, 2004). In most cases, wastes are collected from homes and industries and are either burnt, crushed, buried or dumped into landfills which are created from quarries, borrow pits and abandoned mines sites (Chandak, 2010). But these traditional methods have been criticized by environmentalists owing to the adverse impact they have on the physical environment (Smyth, Fredeen & Booth, 2010). When released in liquid or gas form, waste can be referred to as emissions which could pollute the human environment. In fact, in all its forms – liquid, solid, gas, wastes is a major nuisance to the ecological environment with highly destructive and damaging impact (US-EPA, 2005). Waste dumps result in the release of hazardous toxins into water channels and land areas. The decomposing waste releases carbon dioxide and other emissions that is capable of further compounding the problem of climate change and global warming (UNEP, 2010, UN-Habitat, 2010). Besides, the use of landfills remains highly unsustainable. In other words, as such dump grounds get filled up it becomes increasingly impossible to create new ones to accommodate the ever increasing wastes generated daily owing to ‘Not in my backyard syndrome’ (UNEP, 2011).

Meanwhile, in many cities in developing countries, collection rates remain low and the quality of collection services are generally poor (Tchobanoglous et. al, 2006; Snow & Dickson, 2011). Waste collection services are largely non-existent in poorer neighborhoods such as slums. While there are some successful examples where the private sector and communities are involved in waste management services, in many cities of developing countries, involvement of these segments of society is still very limited (University of Toronto, 2008; Chandak, 2010; Chikarmane & Narayan, n.d). The wastes collected typically end up in open dumps, where they may be burnt and some cases are deposited in illegal dumping sites with severe environmental consequences (Smyth, Fredeen & Booth, 2010), UN-Habitat, 2011).

Effective waste management enhances the wellbeing of the ecological environment and the living organisms that dwell in it. An environment where wastes generated are efficiently disposed enjoys cleanliness which impacts positively on the health of humans and the purity of water channels. It also ensures the preservation of nature and its biodiversity, both flora and fauna, on land and in water (Stakiskis, 2005; Tchobanoglous et al., 2006).

Because of the growing danger that landfills pose to human health and the natural environment, several countries have introduced penalties to discourage the practice (Tudor et al., 2011). For example, in July 2012, Australia introduced a carbon pricing mechanism (CPM). In this regime, the country’s largest environmental polluters and operators of open landfills which have net greenhouse gas emissions (from flaring or electricity generation) exceeding the 25,000 tonne CO₂-e (carbon dioxide equivalent) threshold are liable (ADB, 2013). Similar laws apply in several other developed economies, necessitating the growing emphasis on waste minimization, recycling and reuse (Walker et al., 2014).

In several low income economies, the traditional dumping of wastes on landfills is still the predominant practice. Recycling and reuse of waste is at best, at its infancy (Walker et al., 2014). Fly-tipping – the illegal dumping of waste is still very rampant and regulation remains weak and mostly ineffective (Walker et al., 2014). As the limitations in the traditional methods of waste management becomes more glaring, countries are making more efforts to evolve waste management practices that are more environmentally friendly, cost effective and could convert wastes into ‘productive resources’ (Walker et al., 2014). Several countries have reviewed their environmental laws to compel more sustainable waste management practices. According to the Australian Environmental Protection Act 2007 (cited in ADB, 2008), for example, all wastes should be managed in the following order of preference:

- a) Avoidance

- b) Reuse
- c) Recycling
- d) Recovery of energy
- e) Treatment
- f) Containment
- g) Disposal

The Australian example typifies the contemporary waste management preference of virtually every modern economy (ADB, 2008). It is a paradigm shift from the conventional waste management practices to Integrated Solid Waste Management (ISWM) which is essential for cities in order to effectively manage the waste stream (UNEP, 2011). ISWM is a comprehensive waste prevention, recycling, composting, and disposal programme. An effective ISWM system considers how to prevent, recycle, and manage solid waste in ways that most effectively protect human health and the environment (Chalmin & Gaillochet, 2009; UNEP, 2011). ISWM involves evaluating local needs and conditions, and then selecting and combining the most appropriate waste management activities for those conditions (Wagner & Arnold, 2008, Medina, 2008). As a consequence of conventional waste management practices, many cities in developing countries are facing environmental and health risks as well as losing economic opportunities in terms of resource value of the waste (Vallero & Brasier, 2008; UN-Habitat, 2010; University of Sunshine Coast, 2010). Tones of trillions of wastes are generated around the world daily in the form of left over foods, construction wastes, industrial wastes, abandoned home appliances, furniture, bottles, glasses, cans and containers, plastics, among several others; and there has to be a sustainable way of taking care of them. A pragmatic and sustainable way is to institutionalize the practice of creating other useful products out of the former wastes - and this where recycling becomes the panacea, and for developing countries including Nigeria, this has an additional incentive for creating jobs for millions of unemployed youths (Sampson, 2014).

Abundant Business Opportunities in Recycling

Around the world, waste constitutes an environmental, health and sustainability burden which can be overcome through recycling (US-EPA, 2008; UN-Habitat, 2010; UNEP, 2011). To recycle waste is to convert it from a nuisance state to a useful and reusable state (Sampson, 2009). Poor waste management practices are destroying the physical environment and threatening the earth's biodiversity. The wellbeing of existing and future species is generally perceived to be at risk (UN-Habitat, 2010). It is therefore, increasingly imperative that efficiency in waste management becomes a priority and a way of life for waste generators, disposers and managers. In achieving this, recycling has become the best and preferred waste management method. In its simplest form, recycling is the process of converting wastes into useful or reusable materials (Veolia Environmental Services, 2006). It is now generally seen as the sustainable waste management option as traditional methods fail to live up to environmental expectations. Recycling has become the biggest business opportunity in the waste management sector. Recycling could range from the operation of small, simple decomposition system to the high tech facilities that require huge capital investment and highly technical skills. With the right facilities and knowhow in place, waste items such as aluminum beverage cans, plastic bottles, glass bottles and jars, paperboard cartons, newspapers, metals, magazines, cardboards and several others can be converted with ease from their waste condition to reusable items (Chikarmane & Narayan, n.d.).

Several factors are responsible for the growing adoption of recycling as the preferred waste management option. Several countries in a bid to discourage the environmentally damaging effects of conventional methods of waste disposal, are putting stringent regulatory measures in place, including punitive tax regimes and compensation fines. The UK in 2010 doubled its landfill tax from £24 to £48 per tonne of waste (Timlett & Williams, 2008; Sampson, 2014). The components of wastes allowed into landfills and even the quantity are now highly regulated in developed economies, thereby creating great constraints and bottlenecks for operators of traditional landfills and leaving waste managers with little or no choice but to adopt recycling (Chalmin & Gaillochet, 2009).

A new regulation that came into effect in British Columbia, Canada in May 2014 requires that big businesses that produce and supply packaging and printed paper to household customers be responsible for collecting and recycling the materials once customers are done with them (Sampson, 2014). These companies are also expected to keep record of the quantity of wastes collected and recycled in the process. No doubt, the new regulation would mean additional investment burden for businesses especially at the initial stage. And these businesses would most likely pass on this added financial burden to consumers through higher products pricing. However, as controversial as the new regulation has been, it is expected to have significant environmental impact and make recycling a must for virtually all the big businesses in British Columbia (Sampson, 2014). Strategic business managers would be able to leverage partnerships, shared resources and innovation to convert this seeming regulatory headache into profitable business ventures. It would also help create jobs as companies expand into the mandatory recycling business.

It is pertinent to note that the emergence of waste to energy technology has revolutionized and stratified the waste management industry, creating new opportunities for more technical, capital intensive investments and products offering. Waste management has gone way beyond collecting dirt and wastes and dumping them off in isolated landfills (Sinha, 2010; UNEP, 2011). Especially in the most developed economies of the world, it is also gradually evolving beyond the basic recycling methods. It has grown into a multibillion dollar industry with opportunities for small, medium and large corporate institutions (UNEP, 2010, 2011).

Several pioneer global waste management companies which started off as small businesses have since leveraged innovation to scale up their service offerings and take their positions among the biggest companies of the world. A good example is Waste Management Incorporated. The company started operations in the United States in 1968 when its founder, Wayne Huizenga bought his first garbage disposal truck. It is currently rated among the US Fortune 500 companies even though its services have remained, as its name implies, that of managing the wastes generated by others. From doing this, it generated revenue of \$13.98 billion at year-end 2013 (Sampson, 2014). In Europe, France’s Veolia Environmental Services stands out as arguably the biggest global waste management company with over 300,000 employees in 48 countries and with more than 2,500 subsidiaries around the world. In 2012, Veolia’s revenue stood at €29.4 billion (Veolia Environmental Services, 2013).

Managing waste is now big business and a highly profitable one for investors. A report commissioned by the European Federation of Public Service Unions (EPSU), entitled “Waste management companies in Europe 2007” (cited in ADB, 2008), showed the encouraging profitability of private equity groups in their investments in waste management as can be seen in table 1 below.

Table 1 - Private Equity Groups and Profits In Waste Management

Company	PE Group	Year Bought	Year Sold	Years	Buy Price	Sell Price	Profit	Profit % of Purchase Price
SAUR	PAI	2005	2007	2	1100	1720	620	56%
Sulo	Blackstone/Apax	2004	2007	3	500	1450	380	36%
Cleanaway DE	Blackstone/Apax	2005	2007	2	570	-	-	-
Cory	Montagu PE	2005	2007	2	300	840	540	180%
WRG	Terra Firma	2003	2006	3	760	2000	915	89%
Shanks landfills	Terra Firma	2004	2006	2	325	-	-	-
Average (exc BUS)				2.3	3555	6010	2455	69%
BUS	Star Capital	2005	2007	2	-	330	‘healthy’	-

Source: www.psir.org/reports/2007-06-G-EWCs.doc

Moreover, a study prepared for the European Union Commission (cited in UNEP, 2011) estimates that full implementation of EU waste legislation would save €72 billion a year, increase the annual turnover of the EU waste management and recycling sector by €42 billion, and creates over 400,000 jobs by 2020.

The waste management sector is expanding rapidly, and innovation is the key driver of this growth. In the new order, waste monetization has taken on a whole new meaning. Presently, energy, including electricity, heat and bio-fuel is generated from wastes (UNEP, 2011). Waste-to-energy is the most recent innovation in waste management which entails burning wastes to produce steam which is then used to turn turbines, producing electricity and other energy sources (Walker et al., 2014). Physicists are already exploring the possibility of harnessing extreme microbes as 'supercharged carbon recyclers' that could be used to recycle carbon into renewable fuels and chemicals (Sampson, 2014). This is how far the business of waste management has gone in the last couple of years.

Perhaps, even more interesting is the evolving anaerobic digestion technology now available in some countries, including Australia. The Small Scale Anaerobic Digestion (SSAD) for example allows households to recycle their own solid and water wastes and convert them into sources of heat, electricity and fertilizers, which are in turn reused by the same households. By so doing, the ultimate aim is to decentralize the sources of energy and waste management and bring them closer to the people, at lower costs and in a more environmentally friendly manner (UNEP, 2011).

Another attraction in waste recycling is that recycled materials are less expensive than products made from virgin materials (Eurostat, 2010). It usually requires significantly less energy, water and other resources to recycle materials than to produce new ones. For example, 'recycling 1000 kg of aluminum cans save approximately 5000 kg of bauxite ore being mined and 95% of the energy required to refine it' (Eurostat, 2010). From the consumers perspective therefore, people are getting increasingly aware of, and showing preferences for recycled products and materials, not just for their positive environmental impact but also for their cost effectiveness (Tudor et al., 2011). Prices of fresh materials are fast increasing, making recycled ones more attractive options. Environmentally-aware consumers prefer to patronize materials and products that are certified to be recycled.

To promote the practice of recycling, regulations in several developed economies mandate retail stores to operate a free 'take back' scheme that allows customers to return to the items they no longer find useful (Modak, 2010). These could include household electrical and electronic appliances, batteries, cell phones, among others. Businesses are expected to take these wastes to designated recycling centres or recycle the items themselves (Wagner, 2007; Suttibak & Nitivattananon, 2008). In some countries, retail stores have also been mandated to display visible posters and banners in their outlets, websites and products packages informing customers of this free waste 'take back' service (Sampson, 2014).

Also, in parts of the United States, regulations now exist that make it an offence to mix certain categories of wastes together during collection or disposal, especially wastes that are categorized as hazardous (University of Toronto, 2008). Usually, materials for recycling are collected separately with dedicated bins and collection vehicles to make for easier sorting and processing. Care is taken to ensure that those in the same category are disposed together and using the regulated channels and following the laid down procedures. These are all in efforts to reduce the negative impact of wastes on humans and the environment (Sampson, 2009).

Promoting Environmental Sustainability and Job/Wealth Creation through Integrated Solid Management System

The opportunity in waste management is a global one, with great potential to provide a twin solution to environmental sustainability and job/wealth creation. Yet these huge opportunities are hardly fully harnessed. Much of the potential benefits in waste recycling are simply wasting away, not only in developing and low income economies but also in the most advanced economies. A European Union report on how member states manage their municipal waste showed startling differences across the EU as shown in table 2 below.

Table 2 - Waste Management Practices in the Eu-15 Countries

Country	2010			2011		
	Recycling	Landfill	Incineration	Recycling	Landfill	Incineration
EU-15	26	58	16	44	34	22
Austria	41	47	12	61	10	29
Belgium	20	44	36	62	5	33
Denmark	31	17	52	40	5	55
Finland	35	65	0	33	59	9
France	18	45	37	32	35	33
Germany	45	39	16	68	1	32
Greece	1	99	0	13	87	0
Ireland	23	77	0	41	59	0
Italy	2	93	5	36	52	12
Luxembourg	20	27	53	43	19	38
Netherlands	46	29	25	64	2	34
Portugal	48	52	0	15	63	22
Spain	35	60	5	43	50	7
Sweden	26	35	39	48	5	47
United Kingdom	8	83	9	31	60	9

Source: <http://warr.org.1145/1/182.pdf>

Several developed economies still dispose up to 50 percent of their wastes through landfills. As seen in the table above, as at 2011, several EU economies, including the United Kingdom and Greece still had land filling and incineration (burning) as their main waste management practices. Even though recent European Union legislation mandate that 50% of all household wastes must be re-used or recycled by the year 2020, several member countries have fared poorly in actualizing this target(UNEP, 2013).

While reviewing the outcome of a 2012 European Union sponsored report to ascertain the progress of EU countries in sustainable waste management, EU's Environment Commissioner, Janez Potoenik had lamented:

“the picture that emerges from this exercise confirms my strong concerns. Many member states are still land filling huge amounts of municipal waste – the worst waste management option – despite structural funds being available to finance better options. Valuable resources are being buried, potential economic benefits are being lost, jobs in the waste management sector are not being created, and human health and the environment suffer. This is hard to defend in our present economic circumstances” (UNEP, 2013:88).

This same paradox is true for several economies outside the EU where the huge wealth beneath the heaps of wastes littering landfills is yet to be determined and explored (Sampson, 2014). This is particularly pathetic for low income economies where heaps of wastes litter the streets unattended, and where millions of youths, skilled and unskilled, roam the streets daily in search of means of sustainable livelihood. Like Janez Potoenk observed above, by ignoring these heaps and failing to see and explore the business opportunities in them, ‘valuable resources are being buried, potential economic benefits are being lost, jobs in the waste management sector are not being created, and human health and the environment suffer’ (UNEP, 2013).

Government agencies in charge of waste management and the environment should begin to look beyond merely identifying or creating landfills to dump the tones of wastes generated daily into. Their job should include mapping out strategies on how to convert this huge dung into wealth for the poor and jobs for the unemployed. It is quite encouraging that several developing African economies including Nigeria, Cote d’Ivoire, Ghana, Kenya, among others have huge potential, and in fact declared a state of emergency in their agricultural sector. To complement this, perhaps, it is also time to create a booming industry out of

waste management, especially since like food the demand for waste management would forever remain potent (Sampson, 2014).

For several low income economies, the potential in waste management as an economic empowerment resource remains almost completely untapped. “The wealth beneath the dung is yet to be discovered both at the public and private sector levels” (Sampson, 2014:28). While aspiring entrepreneurs must begin to look this way for business opportunities that have little or no entry barriers and with little or no start off cost, governments and indeed non-profit organizations could also alleviate poverty and the rising unemployment situation by supporting the setting up of waste management businesses at individual and communal levels (Chandak, 2010). This would not only help clean up the environment but also create wealth for the millions of desperate youths in need of means of livelihood.

For the millions of job seekers out there looking to start off small scale businesses, opportunities exists in waste recycling at little or no start off cost – collection, sorting, sales and recycling of diverse waste materials including glasses, metals, plastic wastes, cell phones and several others. In India for example where a huge pool of job seekers exists, the country’s annually generated solid wastes put at over 55 million tones become a potential gold mine that could be leveraged to create millions of job opportunities (Medina, 2008; Sinha, 2010; Chikarmane, n.d.). The same applies in several other emerging and low income economies.

Processes in Waste Management Business in Nigeria – An Overview

In delving into waste management business, a major first step would include identifying the wastes of interest, the likely markets, demand trends, existing recycling plants in the vicinity and how much the recyclers offer per tone for the materials (Sampson, 2014). It is also important to get information on existing competition and relevant government policies and regulations regarding the business (Chalmin & Gaillochot, 2009). Equally important is the need to identify where the desired waste materials could be sourced. This would usually include households, companies, construction sites, supermarkets, restaurants, hotels, bars, parks, schools, stadia and sports centres, among others. These waste materials are usually collected free. At times, the owners of the waste might even be willing to pay a token to have it taken off them. Once collected, the wastes could be sorted by type, colour, content, among others, to enhance their value per kilo or tone and their attractiveness to recyclers. Though regulations in several countries mandate recycling centres to collect any volume of wastes on offer from certified operators, the higher the loads of wastes in tonnage, the easier it is to get a market and good price for them (Medina, 2008). According to extant research, it could cost as little as \$5,000 to start off a waste management business, especially if the purchase of heavy equipment such as trucks are not required (Medina, 2008; Chikarmane & Narayan, n.d). For a standard sized waste management business, operational costs would usually include salaries and wages, taxes and fees, equipment, transportation, storage space and rental expenses, utilities and energy, advertising and promotion. If the start off plan is to collect wastes and send to recycling centre in exchange for cash, far less fund is required beyond buying wastes collection bins and transporting the collected items to the designated collection centres. For several low income economies where the waste sector is still highly underdeveloped, little or no regulatory barriers exist to inhibit new entrants (Sampson, 2009; Modak, 2010). It is also interesting to note that several websites exist that are willing to buy off certain types of solid wastes without any form of physical contact with the waste collectors. Good examples are old cell phones which could attract as much as \$50 per phone, and for which some online buyers are willing to pay the shipping costs for specified quantities (Sinha, 2010). For developing economies where cell phone recycling centres barely exist, and where managing wasted cell phones constitutes a big headache, this creates a potential gold mine for interested collectors.

For small businesses that may want to venture into actual recycling, several small sized, low priced waste processors exist which they could leverage as their start off recycling tools. A good example is the P&P Office Waste Processor which processes paper wastes into fully made pencils. The example of Waste Management Inc., Republic Services Inc., Veolia Environmental Services, among other highly successful waste management companies around the world, have demonstrated the huge business opportunities that

waste management portends for big and small entrepreneurs (Veolia Environmental Services, 2006; Modak, 2010; Sinha, 2010). With waste management, there is something for everyone to do, at individual and institutional levels, depending on available resources.

OPTIONS IN WASTE MANAGEMENT BUSINESS

According to Sampson (2014), there are several options for a would-be waste manager. These include:

- a) **Pickup Option:** From the small business perspective, a waste management company could provide just services – collecting recyclable wastes from individuals, communities and institutions and sending them to recycling centres in exchange for cash. In Sweden and several other developed countries, individuals earn meaningful income from collecting trashed glasses, plastic bottles, tins and several other containers and selling them to designed collection centres. This practice is now institutionalized in most developed countries. To encourage this practice, some countries subsidize recycling programmes from deposits paid on beverage containers.
- b) **Rentals:** Some waste management businesses also focus on rental services, renting and leasing out waste management equipment and facilities such as dumpsters, drums for small wastes and trucks for bulk wastes. There are also special pick up equipment for the collection of hazardous wastes. Such rental services could be rendered to individuals, businesses, communities, among others.
- c) **Manufacturing:** Waste management business exist that manufacture basic and sophisticated waste management tools, including waste disposal bags, waste bins, roll-off plastic containers, among others. For the medium to large companies, other waste management facilities up for manufacturing include trucks, dumpsters, waste processors and diverse types of recycling plants.
- d) **Recycling:** Another option for waste management companies is the setting up of recycling facilities where collected wastes are converted into new products. Depending on the size of the company and the waste management facilities on ground, types of waste that could be collected and recycled include green wastes which are cuttings from homes and community gardens, including leaves, tree limbs and stumps, bulk wastes including heavy items like furniture, mattresses, engine parts, which are today easily recyclable. Others include organic wastes, including food and other decomposable items; construction and demolition wastes which are wastes resulting from construction of housing and other infrastructural projects, including unwanted concrete, asphalt, sand, bricks, tiles, among others. Also recyclable are hazardous wastes which include chemicals such as paints, pesticides, ignitable materials and motor oil that have outlived their usefulness. Hazardous wastes are highly harmful to the ecological environment and human health and are therefore disposed and recycled with utmost care and expertise. In most countries, management of hazardous wastes is guided by strict regulations and guidelines (Eurostat, 2010).

For potential or existing business owners, opportunities exist in all of these areas of wastes management and more, depending on available capital, facilities and expertise. As concerns grow over climate global warming and other ecological hazards, regulations and environmentalists around the world have intensified their clamp down on irresponsible waste disposal practices. Reuse and recycling of waste materials have become the preferred options. Thanks to ever improving waste management technologies and innovations, virtually everything is now recyclable – cell phones, computers, plastics, organic wastes, nylon, glass, food waste, furniture, vehicles, green waste, paper, water, wood, metal, construction wastes, clothing, jewelries, household electronic appliances, among others (Vallero & Brasier, 2008). These have created great business opportunities for discerning entrepreneurs. This is even more so for developing and low income economies where waste management potentials remain largely untapped. Added to this is the fact that waste management creates an endless opportunity that would last for as long as humanity.

CONCLUSION

The world is developing rapidly. Individuals, communities, industries keep using up more sophisticated items, both biodegradable and non-biodegradable. These items, solid, liquid, gas, or in which ever form

they come, must be properly managed once they outlive their usefulness. If not, human health, the ecological environment, and indeed posterity, could suffer the consequences (Wagner, 2007; Wagner & Arnold, 2008; US-EPA, 2008, ADB, 2008; UNEP, 2010, UNEP, 2011). Effective waste management such as recycling presents great opportunities not just to manage our environment better but also to create wealth for the world's growing population. For the discerning and innovative entrepreneurs, waste management creates multiple channels of economic gains that cannot be ignored.

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