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**Inclusive Growth in Africa: Measurement, Causes, and Consequences**

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Abstract
Waste management is a significant problem in Africa, particularly in the Sub-Saharan region, where only a fraction of wastes are managed properly. In many cities the informal waste sector (IWS) collects, handles, processes, and recycles wastes, providing an income to about 1% of the urban population. The paper analyzes recent experience and argues that African IWS workers are being excluded from the development process. Africa should learn from the best practices and lessons learned by Latin America and Asia in the social inclusion of the IWS. A more inclusive growth would be socially desirable, economically viable, and environmentally sound.

JEL Codes: F63, F64, F66, Q53

Keywords: Africa, environment, waste, informal sector, poverty, inclusive growth

1. Introduction
Cities in the developing world are undergoing rapid urbanization, especially in Africa and Asia. See Figure 1. Africa’s urban population will increase from 414 million in 2011 to over 1.2 billion by 2050. Thus, over this period, Africa will add 851 million to its urban population.

Urbanization in the developing world implies the expansion of slum areas and the creation of new ones. According to a UN report, nearly 1 billion people worldwide live in slums, or about a third of the world’s city dwellers. If present trends continue, 2 billion people could be living in slums by the year 2030. Future need for waste collection in slums, therefore, is likely to put additional strain on municipalities already unable to provide the service to their current residents. Population growth intensifies the pressure on urban infrastructure in many cities already overburdened with the provision of urban services. Many developing world cities lack the resources to meet the demand for services such as water, sanitation and solid waste management. Many cities in sub-Saharan Africa collect less than half of the wastes they generate. Uncollected wastes generate air, water and land pollution that poses risks to human health and the environment.
Solid waste management in developing countries has been neglected by policy makers and academics. Nevertheless, the improper handling and disposal of solid wastes constitutes a serious problem: it contributes to the high morbidity and mortality rates in many cities. This paper examines the challenges and opportunities that exist in improving the management of wastes in Africa.

2. Municipal Solid Waste Management in Developing Country Cities

Current Problems
Collecting, transporting and disposing of MSW represent a large expenditure for developing country cities: waste management usually accounts for 30-50 percent of municipal operational budgets. Despite these high expenses, African cities collect only 45 percent of the refuse generated. In fact, sub-Saharan Africa has the most deficient waste management systems in the developing world. See Tables 1 and 2.
### Table 1
Waste Collection and Disposal by Income Levels

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Waste Collection</th>
<th>Proper Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-Income Countries</td>
<td>40 %</td>
<td>5 %</td>
</tr>
<tr>
<td>Middle-Income Countries</td>
<td>60 %</td>
<td>30 %</td>
</tr>
<tr>
<td>High-Income Countries</td>
<td>100 %</td>
<td>100 %</td>
</tr>
</tbody>
</table>


### Table 2
Waste Collection by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Waste Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>OECD</td>
<td>97 %</td>
</tr>
<tr>
<td>MENA Countries</td>
<td>85 %</td>
</tr>
<tr>
<td>LAC Countries</td>
<td>78 %</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>78 %</td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>78 %</td>
</tr>
<tr>
<td>South Asia</td>
<td>64 %</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>45 %</td>
</tr>
</tbody>
</table>


In areas that lack refuse collection—usually slums—residents tend to either dump their garbage at the nearest vacant lot, public space, creek, river, or simply burn it in their backyards. Uncollected waste may accumulate on the streets and clog drains when it rains, which may cause flooding. Wastes can also be carried away by runoff water to rivers, lakes and seas, affecting those ecosystems. Alternatively, wastes may end up in open dumps—legal and illegal—, the most common disposal method in the developing world.
Open dumping of solid wastes generates various environmental and health hazards. The decomposition of organic materials produces methane, which can cause fire and explosions, and contributes to global warming. The biological and chemical processes that occur in open dumps produce strong leachates, which pollute surface and groundwater. Fires periodically break out in open dumps, generating smoke and contributing to air pollution. Food leftovers and kitchen wastes attract birds, rats, flies and other animals to the dumps. Animals feeding at the dumps may transmit diseases to humans living in the vicinity. Biodegradation of organic materials may take decades, which may limit the future use of the land on which open dumps are located.

Globalization, Generation of Wastes and their Impact on Human Health and the Environment

A positive correlation tends to exist between a community’s income and the amount of solid wastes generated. See Table 3. Wealthier individuals consume more than lower-income ones, which results in a higher waste generation rate for the former. The processes of accelerated population growth and urbanization translate into a greater volume of wastes generated.

Higher incomes and economic growth also tend to have an impact on the composition of wastes. As a result of population growth and economic growth in Africa, waste generation is projected to triple between 2010 and 2025. See Figure 2. Waste generation in practically all African countries is projected to grow. Waste generation in Nigeria, for instance, will increase by 250%. See Figure 3.

Table 3
Waste Generation per capita and Total Waste Generation

<table>
<thead>
<tr>
<th></th>
<th>Waste Generation Rate</th>
<th>Total Waste Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(lbs./person/day)</td>
<td>(million tons/year)</td>
</tr>
<tr>
<td>Low-Income Countries</td>
<td>1.3</td>
<td>569</td>
</tr>
<tr>
<td>Middle-Income Countries</td>
<td>1.8</td>
<td>986</td>
</tr>
<tr>
<td>High-Income Countries</td>
<td>3.1</td>
<td>566</td>
</tr>
</tbody>
</table>

**Figure 2**

Projected Urban Population and Waste Generation in sub-Saharan Africa
(population in millions; waste in ‘000s of tons/day)


**Figure 3**

Projected Urban Population and Waste Generation in Selected African Countries
(population in millions; waste in ‘000s of tons/day)

Conventional Waste Management Systems and Their Shortcomings

In order to extend refuse collection, upgrade disposal facilities, and diminish the risks to human health and the environment associated with inadequate waste management, various measures have been implemented. The solutions that are commonly proposed to the problems in municipal solid waste management (MSWM) in the developing world often have the following features:

1) Centralized and undiversified – solutions that do not distinguish the different needs and heterogeneity of neighborhoods within each city, and between cities
2) Bureaucratic – top-down solutions, usually reached without or with little community participation
3) Capital-intensive approaches – involving advanced technology and equipment, frequently imported from industrialized countries
4) Formal – conventional solutions only consider the formal sector, neglecting the existence and possible contributions of the informal sector that has developed around waste collection and recycling in many cities.

It can be argued that cities in the developing world require a fundamentally different approach to the solutions that are currently proposed.

3. Differences between developed and developing country cities that affect MSWM

Profound differences exist between industrialized and developing countries in terms of income, standard of living, consumption patterns, institutional capacity, and capital available for urban investments. Conventional solutions usually do not take into account these differences, resulting in less than optimum outcomes.

The following represent the major differences between industrialized and developing countries relevant to the design of MSWM solutions in the latter:

1) Industrialized countries enjoy a relative abundance of capital and have high labor costs, while developing countries have a relative scarcity of capital and an abundance of unskilled and inexpensive labor. It makes sense for the former to devise waste management systems intensive in capital and that save in labor costs, but it often does not make sense for the latter
to follow the same approach. Developing countries need low-cost, labor-intensive solutions that reduce poverty, particularly among the most underprivileged segments of society.

2) The physical characteristics of cities in developing and industrialized countries differ markedly. Cities in the developing world have extensive areas with substandard conditions – slums – with narrow, hilly and unpaved streets.

3) An important difference between industrialized and developing countries refers to the dissimilar amount and characteristics of wastes generated. Waste generated in developing countries contains a large percentage of organic materials, usually three times higher than that of industrialized countries.

4) Many cities in the developing world have a dynamic informal sector that has evolved around wastes, which provides income opportunities for recent migrants, unemployed, children, women, elderly and handicapped individuals.

4. The Informal Waste Sector

The Informal Waste Sector (IWS) includes the following categories of activities related to solid wastes:

1) Informal waste collection – In some areas, often low-income neighborhoods not served by municipal waste collection service, entrepreneurs provide this service. Informal collectors charge a pick up fee to residents. Collectors use pushcarts, donkey carts, horse carts and motorized vehicles to transport the waste. Sometimes collectors recover the recyclables in the waste and sell them for reuse or recycling.

2) Informal recovery of recyclables – This is the most common activity in which people recover materials from waste for reuse or recycling.

3) Manufacturing activities – Some enterprising individuals or groups engage in manufacturing activities that use materials recovered from waste as raw materials. By adding value to waste materials, they can earn higher incomes than just recovering and selling recyclables. A wide variety of items are manufactured from waste, such as pots and pans made from melted Aluminum cans, roof tiles from plastic waste, and cleaning mops made from textile waste. The transformation of organic waste into compost also falls into this category.
4) Provision of services - Individuals or groups can also engage in the provision of waste management services. The most common services provided are street sweeping and cleaning of facilities such as bus stations.

The IWS can be a partner to African cities in improving waste collection, composting, recycling, and final disposal. A growing number of countries in Asia and Latin America are already working with the IWS in order to upgrade waste management, reduce poverty and pursue a more inclusive growth. Section 8 of this paper examines recent experience in this regard. Most African countries, however, do not realize the development potential of working with the IWS.

5. The Informal Waste Sector in South Africa

South Africa has the continent’s largest economy and it offers interesting case studies related to the IWS. South African scavengers are popularly known as salvagers or reclaimers. Little is known about them. Reclaimers have been traditionally black –before and after Apartheid– and looked down by the rest of society. Despite the official policy of black economic empowerment, reclaimers have been largely ignored and there has been little effort for their social inclusion. Waste management legislation / programs at the national level do not even mention reclaimers. They recover any materials that can be recycled –metals, plastics, glass and so forth– as well as discarded food, blankets, construction materials, and any item that can be reused or sold.

The experience of 3 municipalities is briefly analyzed: Msunduzi, Metsimaholo, and Emfuleni. Each municipality has adopted a different approach to reclaimers. In Msunduzi the municipality has banned scavenging in the local landfill. The reclaimers, however, sneak onto the landfill for a few hours each day, but this has reduced their income by up to 80%. Msunduzi has granted a tender to a company to develop a composting and materials recovery facility at the landfill. The municipality has requested that some of the existing reclaimers be hired by the company granted the contract at the landfill. Other than that reclaimers have been completely ignored from the processes to formalize recycling. When Reclaimers had access to the landfill they were able to put their children through school and earned enough that their children did not need to work at the landfill to supplement their income.
Metsimaholo municipality allows the *reclaimers* to stay on the landfill, but only if they agree to sell their materials to a black economic empowerment company run by two local professionals. In the past they could decide whom to sell or the terms of such sales. They have been disempowered and their incomes have been reduced. Both Msunduzi and Metsimaholo have relied on force and security to compel the *reclaimers* to comply with their policies.

Despite having worked at a landfill for over 20 years and being organized, the Metsimaholo municipality decided to evict the *reclaimers*. Rather than helping the *reclaimers* to expand and formalize their operations the municipality has opted to use a military fence to close off the landfill, grant a private company the sole right to sell recyclable materials retrieved from the landfill and force the *reclaimers* to sell only to this company. The *reclaimers* say that their incomes have gone down from around R4000 per month to less than R3000 per month.

Emfuleni municipality has taken a more progressive approach. It is in the process of regularizing reclaiming on the landfills and is assisting *reclaimers* working on the dumps and in the streets to transport their goods to the market. While it has engaged the *reclaimers* and is creating space for them within the waste management system, the *reclaimers* are not active participants in determining the vision and structure of the waste management system.

A troubling trend is the following. Many cities in South Africa are selling the right to recover recyclables to private companies, while ignoring the development potential of partnering with the *reclaimers*. This will impoverish the poor and benefit the well off, the opposite of what they should be doing.

6. The Informal Waste Sector in Tunisia

Tunisia is at the forefront in working with the IWS in Africa. This section briefly describes the Tunisian experience in incorporating the informal sector in an extended producer responsibility program. This is perhaps the first program if its kind in the world.
Post-consumer packaging waste was a significant problem in Tunisia. Discarded items such as bottles, cans, and cartons could be commonly seen littering the roads and public spaces. In order to address this problem, in 1997 the country’s National Agency for the Protection of the Environment (ANPE) created the ECO-lef program, a national system for the recovery and recycling of post-consumer packaging.

Initially, the program signed contracts with two private companies, who installed 470 bins throughout the country. Residents could voluntarily deposit their discarded packaging in these bins. The contents from each bins would be collected, taken for sorting and then for recycling. The result, however, was low public participation and a high collection cost per ton. ANPE decided to take advantage of market forces by paying individual collectors per Kilo of discarded packaging. ANPE helped set up collection depots with a scale, baler and storage area. As of mid-2010, there were 313 collection depots in the country. This system has provided income opportunities for 11,000 low-income individuals. They have formed over 1,900 micro-enterprises in order to provide this service.

The system has been so successful, that in 2001, ANPE introduced producer responsibility schemes for the collection, treatment and recovery of plastic packaging, e-waste, batteries, lubricating oil, oil filters and tires.

ECO-lef, with the collaboration of the informal collectors, collected for recycling 15,800 tons of plastic packaging waste in 2008. Depending on the type of polymer, 70 to 90% of collected plastic waste is captured by the system.

ECO-lef demonstrates that extended producer responsibility programs can be successfully implemented in developing countries. The informal sector involvement in the collection of waste created income opportunities for disadvantaged individuals, increased collection, and reduced collection costs.
7. The Informal Waste Sector in Egypt
Cairo’s IWS manages about 60% of the wastes generated in the city. The informal system recycles 80% of each ton of wastes that it handles, which is one of the highest recycling rates in the world. Instead of supporting this highly effective system, however, the national and local governments are generally hostile to it. This section analyzes recent experience in the country’s capital and largest city.

The collection and proper treatment and disposal of the increasing amounts of solid waste represents a daily challenge to governorates and municipalities throughout the country. Cairo, the largest city in Africa, with a population of over 12 million in its metropolitan area, faces significant problems in managing its wastes.

The two main problems are the insufficient collection of wastes and their inappropriate final disposal. Like most cities in Africa, Cairo struggles to provide waste management services to all its residents. Low-income areas usually receive sporadic refuse collection at best, or completely lack this service. In unserved areas, residents dispose of their wastes by throwing them out into the streets, the nearest vacant lot, or burn them. These practices cause pollution and pose risks to human health and the environment. The waste generation rate in Cairo is 0.8 Kg. / person / day, which translates into a total generation of more than 9,600 metric tons per day. The waste generated is largely organic: 60 %, and with a density of 300 Kg / m³ both relatively high.

Waste collection in Cairo is conducted by private companies, NGOs and by the informal sector. The informal system comprises micro-enterprises with a well-defined set of internal rules, rights, and sanctioning mechanisms that evolved over several decades. The informal refuse collectors are popularly known as zabbaleen.

The informal refuse collection and recycling system used to work as follows: the zabbaleen picked up the garbage from residences, transported it to their homes, where it was sorted, first into organic and inorganic portions. Organic wastes were used to fatten pigs. Inorganic materials were sorted by type: paper, cardboard, metals, glass, and so on. In the past, the zabbaleen established settlements on rented land in the outskirts of the city, but, due to Cairo’s rapid
growth, they had to move farther and farther away. Some of the older collectors had to move up to 6 times between 1937 and 1970. That year, the government offered the zabbaleen land on an abandoned stone quarry, a desert area at the foot of the Mokattam Mountains (also spelled Moqattam), Torah, and other areas. The government assured them that they would not have to move again. The relocation to this area represented important financial losses for the zabbaleen: moving their herds of pigs through the city was not feasible, and they had to sell most of their pigs in a few days at a loss.

The zabbaleen were in contact with wastes every day. In addition to their handling of refuse, the hygienic conditions in their settlement posed serious risks to their health: infectious diseases of all kinds were common. Swarms of flies and rats could be seen in their settlement even at broad daylight. Their homes were built with discarded cardboard and tin, with garbage everywhere, no water, sewage or electricity. Pigs lived alongside with humans. Even animal carcasses could be seen on the streets of the zabbaleen settlements. These conditions had a deleterious impact on the zabbaleen’s health. In the 1980s, a study estimated infant mortality at a Cairo zabbaleen settlement at 25%. Another study conducted in Port Said’s zabbaleen community found an infant mortality rate of 33%, a rate several times higher than that of the general population. The prevalence of enteric and parasitic diseases was also significantly higher in the zabbaleen community than in the larger population.

Over the past two decades, the zabbaleen have invested significant amounts of money, time, and effort to improve their working and living conditions. They have adapted to changing market and regulatory conditions. When Cairo authorities required the use of trucks instead of donkey trucks in the late 1980s, the zabbaleen purchased trucks for their refuse collection activities. By 1993, 84% of the zabbaleen families had acquired trucks for collecting and transporting wastes. They invested in equipment to process and add value to the recyclable materials. They also created micro-enterprises to manufacture products from waste materials, providing employment to hundreds of workers.

The zabbaleen community has received various forms of support from international NGOs and organizations. An upgrade program funded by the World Bank succeeded in improving living
conditions. With Oxfam’s support, a Small Industries Program was created to upgrade the residents' waste recycling capabilities by introducing mechanization into the process. Its main objective was the maximization *zabbaleen* earnings. Loans were made to start micro-enterprises to process plastics by acquiring granulating machines, and machines to recycle rags.

The Small Industries Program has been highly successful. The workshops produce both final products and intermediary products. A survey conducted in 2000 revealed that there were 228 micro and small recycling enterprises in the Mokattam settlement, employing 1,435 individuals from several communities.

A mechanization project started in 1987, when Cairo authorities banned the use of donkey carts for refuse collection. They had to adapt if they wanted to continue their activities. *Wahiya* and *zabbaleen* organized themselves in more than 50 companies. They acquired trucks, which made collection and transportation easier and faster, improving their productivity. The use of trucks had an additional benefit: it made unnecessary the work of children, who could be sent to school instead. However, a persistent problem has been the frequent break down of the trucks, raising operation costs and affecting service delivery. Given this negative experience, some decided to rent the trucks instead of purchasing them. In that way, whenever a rental truck breaks down, they simply rent another one.

With support from the Ford Foundation and the European Community a compost plant was built in order to process organic wastes. Two other projects provided significant benefits, mostly to local women: rug weaving and paper recycling. A Mother and Child Center was created, which offers health education programs, medical services, and serves as a cultural center for the community as well.

Throughout the past 100 years, the *zabbaleen* have shown a remarkable ability to adapt to technological change, shifts in market demand, and entrepreneurship to create small businesses and to add value to the materials recovered from waste. They collect more than 3,500 tons of wastes a day in Cairo. Clearly, they play a very important role in providing solid waste collection to hundreds of thousands of residents. *Zabbaleen* activities also have a significant economic impact: assuming that 60,000 refuse collectors and that they earn US$ 69 a month, the economic
impact of their activities is US$ 50 million a year. Despite the social, economic, and environmental benefits of zabbaleen activities, Egyptian authorities refuse to actively support them.

The Egyptian government awarded contracts to private companies for waste collection in 2002. In 2009, the authorities themselves had to admit that waste management had deteriorated in that period. The same year, however, the national government dealt a heavy blow to the zabbaleen economy by killing all pigs for fear of swine flu, despite the lack of any cases of this disease in the country’s pigs. The pigs consumed a significant percentage of organic waste. Today large amounts of organic waste simply accumulate on the streets of Cairo.

Achieving a sustainable waste management is not just a technical matter of acquiring more equipment or building new facilities. A crucial component in improving waste management systems in developing countries refers to the existence of a large informal waste sector and its linkages to poverty. According to World Bank estimates, the informal waste sector (IWS) provides a livelihood to about 1% of the urban population in the developing world. Thus, about 15 million people worldwide survive by working with waste. Many IWS workers are low-income, vulnerable individuals, such as children, women, elderly, disabled, unemployed, and migrants. Traditionally, IWS workers have been considered a problem, and most often have been repressed and their activities declared illegal. Over the past decade or so, a re-thinking of the IWS in the developing world has been taking place: more and more, it is recognized that the IWS, instead of being a problem, can be part of the solution and of a strategy to achieve a sustainable waste management. It is increasingly evident that, with the proper supportive policies in place, the IWS can make significant contributions to a country’s green growth, as well as reducing poverty. This case study examines recent experience in integrating poverty reduction in green growth efforts for improving urban waste management in the developing world.
Brazil

Brazilian scavengers are popularly known as *catadores*, and have been traditionally looked down by the rest of society, and were often harassed by police. Public policy on scavenger activities had a turning point in the late 1990s. In 1998, UNICEF published a study on child labor among *catadores*, which found that over 45,000 children nationwide worked as scavengers, and 30% of them had no schooling at all. This study and the public reaction to it, was deeply embarrassing to the Brazilian federal government. The government reacted quickly and later in 1998, it created the Waste and Citizenship Program, WCP (*Lixo e Cidadania* in Portuguese), the first program of its kind in the world. The program included: i) the closure of open dumps in the country over a number of years; ii) the legalization and recognition of the work performed by *catadores*; iii) their participation in integrated waste management programs at the national and state level; iv) promoted the incorporation of *catadores* into public-private partnerships; v) created the “No More Children in Dumps National Campaign” in order to eradicate child labor in scavenging, particularly in open dumps; and vi) created a National Training Program for *catadores* in order to strengthen their organizations.

The WCP program was funded partly by a loan from the World Bank. Its component to eliminate child labor in scavenging included the incorporation of *catador* families into a conditional cash transfer program (*Bolsa Família*). In this program, families with children working in recycling receive a monthly stipend with the condition that their children attend school and see a medical doctor regularly, paid by the government. The cash received monthly by the parents proved a powerful incentive to keep their children at school. By the end of 2005, the program had enrolled more than 46,000 *catador* children, sending them to school, thus reducing dramatically child labor. This is the most successful program in the world in reducing child labor in scavenging. Due to population growth, however, a 2009 study estimated that about 20,000 children nationwide still worked in scavenging.

Two federal government actions in support of *catadores* are particularly important. In 2002, the government legally recognized the work of the *catadores* and created a category for them in the country’s Classification of Occupations. And in December 2009, the government instituted a tax credit that industry can get by consuming recyclable materials purchased directly from
cooperatives of *catadores*. This should be a powerful incentive for industry to buy materials from cooperatives, thus bypassing the middlemen, which could result in higher earnings for the co-ops. The Brazilian private sector also supports *catadores* with grants, credit, and technical assistance.

In reaction to the WCP program and the government’s outreach to *catadores*, in 1999 they created the *Movimento Nacional dos Catadores de Materiais Recicláveis* (MNCR), a national federation of scavenger groups and organizations. MNCR represents 500 *catador* associations and cooperatives with 60,000 members from throughout the country. MNCR is perhaps the most active national association of scavenger groups in the world. MNCR’s main objectives are to represent *catadores*’ views and interests to the rest of society, educate the public on the benefits of their work, and incorporate *catadores* into recycling and waste management programs. In 2008, after 5 years of negotiations, MNCR received a loan from the *Caixa Economica Federal* to build two housing complexes in the city of Sao Paulo for some of its members.

In 2009, MNCR received the National Human Rights Award from the Brazilian government for its work in reducing poverty among *catadores*. But perhaps the most significant recognition of their work is the meeting MNCR has had every year with current President, Luiz Inacio da Silva, popularly known as *Lula*. Brazil is the only country in the world where the president meets regularly with scavengers.

**Colombia**

Colombian waste pickers organized the first national scavenger cooperative movement in the world. The *Fundación Social*, a non-governmental organization, assisted waste pickers in the formation of cooperatives between 1986 and 2000. Faced with the loss of their livelihoods due to the construction of a new sanitary landfill in the city of Manizales, the foundation helped 150 displaced families to form a cooperative. This effort was successful, and encouraged the foundation to assist waste pickers in other cities to also create cooperatives. In 1991, the
*Fundación Social* launched its National Recycling Program, which soon grew to include over 100 waste picker co-ops throughout the country.

The foundation awarded grants, loans for specific projects, and provided the co-ops with legal, administrative and business assistance, as well as free consulting services. In 1998, the foundation donated and made loans to the coops for over U.S. $800,000. With the foundation’s support, waste pickers created a national, regional, and local associations of cooperatives. The Bogota Association of Recyclers, for example, represents 24 cooperatives with 4,500 members. The National Association of Recyclers provides assistance to any group interested in creating a co-op. The major goals of the association are raising awareness of their problems and how their work benefits society, as well as improving the working and living conditions of Colombian scavengers.

Cooperatives created regional marketing associations, which allow them to sell recyclables at higher prices. Co-op members report a higher standard of living, as well as improvements in empowerment, self-esteem and self-reliance compared to when they worked individually. Colombian waste pickers recover and sell over 300,000 tons of recyclables each year, mostly paper, glass, scrap metals, plastics and organics.

**Argentina**

Even though scavenging has existed in Argentina for over one hundred years, in recent years the number of scavengers has increased significantly. The country’s 2002 economic crisis caused massive unemployment. The unemployed had few alternatives to make a living. One of those alternatives was scavenging. Consequently, a large number of waste pickers, locally known as *cartoneros*, can be seen on the streets of many cities. In Buenos Aires alone, the number of *cartoneros* has been estimated at 25,000 and the number of people dependent on these activities at 100,000.

Thus, the economic crisis and unemployment forced people to scavenge, while at the same time provided local manufacturers powerful economic incentive for switching to recovered materials. There are currently over 14 cartonero cooperatives in Buenos Aires. Cooperativa El Ceibo has received the most attention is, located in the capital’s residential area of Palermo. The co-op has 102 members, most of them women. They have signed an agreement with the city government to provide services to an area covering 93 city blocks. Co-op members collect recyclables separated by participating residents at their homes. Therefore, the materials are relatively clean and the risks to their health are minimized. Further, source separated materials also command a higher price. The city of Buenos Aires enacted a law in 2002 legalizing scavenging, recognizing the work of scavengers, and supporting their activities.

**Mexico**

Mexico is the second largest consumer of PET plastics in the world, after the US. PET is commonly used to make soda and water bottles. This high level of consumption and the lack of recycling programs in the country created disposal problems. PET bottles were often discarded everywhere in Mexico, ending up on the streets, roads and even in rural areas. The Mexican government invited bottlers operating in Mexico to clean up their act voluntarily or they would face regulatory action.

Mexican bottlers decided to create a nationwide PET recycling program. They created Avangard, a private company to purchase discarded PET from various sources, clean it, process it and then sell it for recycling. For several years they sold recovered PET to China, where it was recycled. Then, in 2008, they decided to close the loop by recycling the PET within Mexico so that it could be used to make new PET soda and water bottles. Recycled PET is used to make new PET bottles with 10-20 % recycled content. For every pound (454 grams) of PET that is recycled, energy use is reduced by 84% and greenhouse gas emissions by 71%.

Mexico’s PET recycling program has created income opportunities for thousands of waste pickers who recover discarded PET bottles on the streets, waste disposal sites and other places.
Avangard is one of the first private companies in the world to create a program to improve the working and living conditions of scavengers in its supply chain. The main reason for scavengers’ low incomes is the fact that middlemen pay low prices to scavengers. Avangard has decided to purchase PET directly from scavengers, eliminating the middlemen. Thus, scavengers can get higher incomes. Avangard has also financed a program to reduce child labor, and a materials recovery facility where scavengers can work in better conditions. They also promoted the creation of a day care center for children of scavenger families and the formation of cooperatives. This program is profitable and renders social and economic benefits as well.

**The Philippines**

The Metro Manila Women Balikatan Movement, a non-governmental organization, created an innovative program, named *Linis Ganda*. Balikatan is Tagalog for “shoulder to shoulder,” emphasizing their willingness to work with the government to protect the environment. *Linis Ganda* is Tagalog for “clean and beautiful”. *Linis Ganda* took advantage of the positive aspects of a previously existent system of itinerant collection and scavenging while reducing its shortcomings.

Originally developed as a formalized system of scavengers and itinerant buyers of recyclables working for middlemen in the city of San Juan, the program is now composed of cooperatives. The *Linis Ganda* program established a network of itinerant collectors, called “Eco Aides” who were provided with I.D. cards, green T-shirts and green push carts. Two categories of Eco Aides exist: land based and river based. Land-based Eco Aides roam the streets and housing complexes buying recyclables from households salvaging materials from garbage dumped in streets and back alleys, on fixed routes, Monday through Sunday.

Today, there are cooperatives in each of the 17 cities and towns that comprise Metro Manila (MM). In this program each eco-aide has a fixed route in which he/she purchases source-separated recyclables at households and schools. Eco-aides wear green uniforms and use green pushcarts, bicycles and boats.
More than 2,000 Eco Aides purchase 15,000 tons of source-separated recyclables per month from nearly 300,000 households (approximately 20% of the total number of households) in MM. Eco Aides visit households once a week and schools twice a month. They buy various materials from households and mostly paper from schools. Their income ranges from 50 to 500 Filipino pesos (approximately US $ 2-20) a day. Their earnings are higher on Sundays, when they work in wealthy neighborhoods. In 2004, from a collection of about 210,000 tons of materials, they earned 268 million pesos (US $ 10 million). Linis Ganda’s activities also save 18 million pesos a year to the municipalities (US $ 0.66 million). The program recycles nearly 10% of wastes generated in MM at no cost to the government.

**Bangladesh**

The waste generated in Dhaka, Bangladesh, is highly organic. With a population of nearly 7 million, the city only collects about 40% of the total waste generated. Uncollected and improperly managed organic waste is a source of pollution and disease. It can also clog drains and cause floods. But if it is properly managed, it can become a resource.

In 1995, Waste Concern, a local NGO, created a community-based composting program in order to improve organic waste management by using simple, low-tech, low-cost, and labor-intensive methods. Then, in 2006, Waste Concern was the first composting project in the world to receive Clean Development Mechanism (CDM) funds. Organic waste, if left uncollected or sent to an open dump or landfill, generates methane, a potent greenhouse gas. Composting reduces the generation of methane.

The composting CDM project processes 700 tons of materials / day, and created nearly 1,000 jobs for low-income individuals. Households separate their organic waste and deliver it to the Waste Concern collectors, who transport it into bicycle carts to the nearest composting site. The resulting compost is blended with chemical fertilizer and sold to farmers. With UNDP support, Waste Concern is creating an international composting training center in order to promote composting. Thus, composting can create jobs, reduce poverty, and protect human health and the environment.
9. Conclusions

The Informal waste sector (IWS) provides income opportunities to at least 15 million people worldwide. Most of the individuals working in this sector are low-income and vulnerable: children, women, elderly, disabled, and recent immigrants. Public policy on the IWS is undergoing a significant shift. Previously regarded a problem that should be eliminated, the IWS in the developing world is now considered a potential partner to cities. The IWS encompasses four main categories: informal waste collection, scavenging, informal manufacturing using waste materials, and waste-related services. IWS workers invest their own resources in order to engage in these activities. A growing number of studies have pointed out the social, economic, and environmental benefits of the IWS activities. When IWS workers get organized and their efforts supported by the authorities to make their activities safer and legal, it can create jobs, reduce poverty, conserve natural resources, reduce pollution, protect the environment, improve industrial competitiveness, and save cities money. When the development potential of the IWS is harnessed, it can result in grassroots development and empowerment. More and more countries and cities are actively supporting, and implementing inclusive growth efforts with the IWS. Several Latin American and Asian countries –such as Brazil, Argentina, Colombia, Indonesia, India and the Philippines– have enacted legislation / programs in support of the social inclusion of the IWS. African countries, however, lag behind these efforts.

The IWS in Africa is dynamic, adaptable, has entrepreneurial energy and creativity. Most African governments and cities do not realize the development potential of this sector. Many African countries still consider the IWS as a problem that needs to be eliminated. The African IWS is, with some notable exceptions, less organized than in other regions of the developing world. African IWS workers are being excluded from the development process. At the grassroots level, however, highly successful efforts already exist, such as the zabbaleen of Egypt, and the reclaimers in some South African cities. At the national policy level Tunisia has shown pragmatism and willingness to work with the IWS in order to recover waste materials as part of an extended responsibility program. African countries could learn from an analysis of best practices and lessons learned by Latin America and Asia in the social inclusion of the IWS. Given the current trends of economic and population growth in Africa, a more inclusive growth with the IWS would be socially desirable, economically viable, and environmentally sound.
Bibliography


