

# The 3W approach: WASTE



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***“Waste is not just waste,  
it is material in transition”***

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## INTRODUCTION

Waste is unavoidable; produced by all in every society. From the days of primitive society, human and animals have used the resources of the earth to support life and dispose of their wastes. (Bortoleto et al.).

For most people in the developed world, access to basic services like water, sanitation and waste collection is a given. The situation is considerably different in developing countries where access to waste collection services remains sporadic and unequal, particularly in urban context where the proximity to services does not necessarily mean access, and where the urban poor continue to be excluded because of political, social or economic factors.

Increased urbanization coupled with changing consumption patterns have left many governments in developing cities unable to cope, and struggling to provide adequate services for municipal solid waste management. Typically one to two thirds of the solid waste generated is not collected in the rapid urbanizing cities of the developing world (Zurbrügg, 2003). The impact of inadequate waste collection and disposal services include environmental degradation, financial losses and negative health outcomes – the impacts are felt disproportionately by children and the most vulnerable.



Overflowing waste skip in Nairobi, Kenya (Laura Fontaine, 2015)



Photo taken from a private school adjacent to the main dump site of Nairobi (Laura Fontaine, 2015)

## ABOUT THIS PAPER

This paper is a summarised version of the extended waste paper that has been provided on the event thumb drive that all participants will receive. It presents an overview of the emerging trends in the area of urban solid waste management in developing cities. In this paper the term 'urban solid waste' refers to municipal solid waste. We paid specific attention to municipal solid waste generated by households and small businesses.

## OBJECTIVE

With the aim of informing the discussions in the lead up to Habitat III<sup>1</sup>, this paper seeks to achieve three objectives, two short term (next 2 months) and one medium term (next 12 months):

- **Short term:** This paper seeks to act as an introductory background paper for participants at the Healthy and Just Cities for Children and Youth urban Thinkers Campus; especially those who do not come from a background in the waste sector.

<sup>1</sup> Through the UN Habitat Urban Thinkers Campus Healthy and Just Cities for Children and Youth, Geneva, October 2015. The Urban Thinkers Campus is an initiative of UN-Habitat conceived as an open space for critical exchange between urban actors who believe that urbanization is an opportunity and can lead to positive urban transformations. <http://unhabitat.org/urban-thinkers-campus-events/>

- **Short term:** provide an initial structure into which stakeholder case studies and experience can be easily added to provide a platform for knowledge sharing and evidence building
- **Medium Term:** it is proposed the following the UTC, the outcomes of this event will be incorporated into this document to provide a widely informed policy paper. This could be a resource to feed into the New Urban Agenda dialogue in the lead up to Habitat III, and can provide policy recommendations for interested organisations and member states.

## LIMITATIONS

This paper does not claim to be fully comprehensive but rather to provide some preliminary responses to the questions listed above. It is a step forward in providing some high level discussion points substantiated by practical examples. We welcome input and feedback on this paper and on the work that World Vision does in this context.

## SETTING THE SCENE

### CITIES CAN'T COPE, CHILDREN SUFFER

Increased urbanization and changing consumption patterns have resulted in the inadequacy of existing infrastructure for basic services, including municipal solid waste management. In developing cities, a large part of solid municipal waste remains uncollected, specifically in low income areas and informal settlements where (i) it is more difficult to ensure the collection of a relevant tax for basic services; and (ii) street configurations do not allow for the use of traditional waste collection equipment (e.g. Compactor tracks).

There are many other reasons why municipalities cannot handle the amount of waste generated. These include a lack of financial resources, weakness and inadequacy of governance and policy frameworks, the need to prioritize other services (such as health care and education) and a lack of environmental values.

Globally the importance of SWM has been recognised through its inclusion within the Sustainable Development Goals. Within Goal 11 (*'Make cities and human settlements inclusive, safe, resilient and sustainable'*) target 7 seeks to reduce per capita adverse environmental impacts through paying attention to "municipal and other waste management." Additionally, goal 12 (*'Ensure sustainable consumption and production patterns'*) also includes targets for food waste minimisation (12.3); environmentally sound waste management processes (12.4); and reduce waste generation through prevention, reduction, recycling and reuse (12.5).

The negative impacts of poor waste management on communities are significant specifically in relation to health, with young age being a multiplying factor for the negative impact. There are numerous ways that poor solid waste management leads to ill health within urban communities. The most common pathway is through exposure to waste through: digestive exposure; physical contact; or by breathing air contaminated by volatile substances. Contaminants are also transferred from mothers to unborn and breastfeeding children.<sup>2</sup>

Children<sup>3</sup> can often suffer the most as "environmental quality is one of the key factors in determining whether a child survives the first year of life, and strongly influences the child's subsequent physical and mental development. Children are at greater risk from environmental hazards because of their physical size, immature organs, metabolic rate, behaviours, natural curiosity and lack of knowledge."<sup>4</sup>

<sup>2</sup> MORI Chisato and TODAKA Emiko (2011) *Environmental Contaminants and Children's Health*. Japan Maruzen Planet Co, Ltd

<sup>3</sup> "Children account for an average of 37 per cent of the population in developing countries, and up to 49 per cent in the least-developed countries. Worldwide, almost half of all children live in urban areas and are often seen as the most vulnerable in these contexts." Patricio CUEVAS-PARRA Cuevas-Parra (2014) *Just Cities for Children: Voices from Urban Slums*. World Vision International

<sup>4</sup> UNEP, UNICEF, WHO (2002) *Children in the new millennium - Environmental Impact on Health*

TOO MANY ACTORS, TOO LITTLE COORDINATION

In most developed cities, the key actors involved in solid municipal waste management are mostly limited to the municipality and the private sector, and both have clearly defined roles and responsibilities. In contrast there can be a very large range of actors involved in solid municipal waste management in developing cities. Figure 1 (below) illustrates the range of actors involved in waste management in some contexts. Showing the complexities and potential ambiguities regarding responsibility

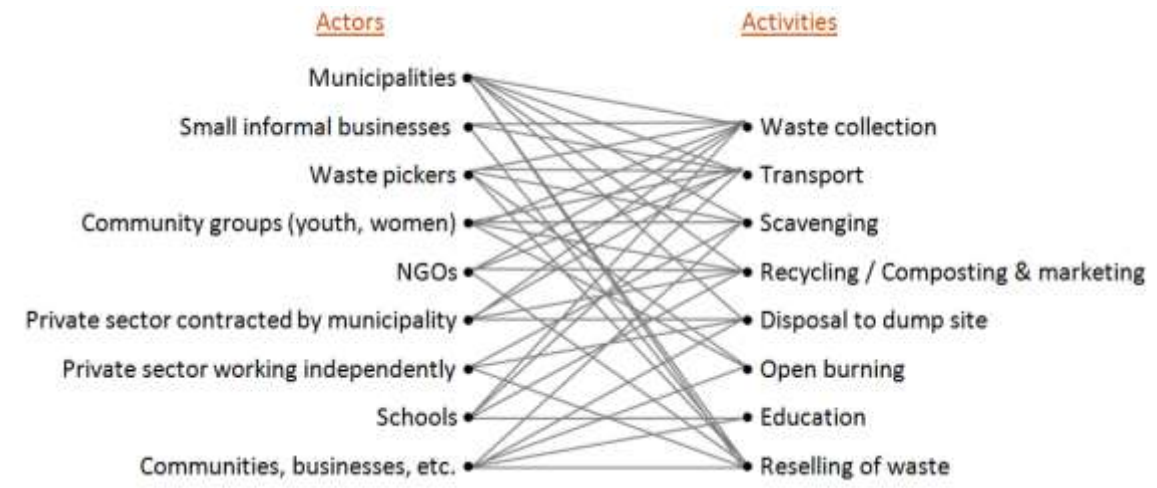


Figure 1: Involvement of a wide range of actors in developing contexts leads to a lack of clarity around roles and responsibilities

The main consequence of this complexity and lack of coordination are high levels of inefficiency, limited value addition to the waste chain and inequalities of service within urban communities. As Christian Zurbrugg explains, a lack of coordination, and especially clarity of payment, often results in organic waste being left at transfer points, often for prolonged periods, creating an unhygienic and unappealing local urban environment<sup>5</sup>. Another impact of a poorly coordinated approach is that inequalities within the waste value chain emerge and waste collectors, especially from within the informal sector, often benefit the least from the value that is being generated.

<sup>5</sup> Chris ZURBRUGG (2003) Solid Waste Management in Developing Countries. SANDEC / EAWAG

## TOWARDS A SUSTAINABLE MODEL FOR MUNICIPAL SOLID WASTE MANAGEMENT

In this section, we explore solid waste management across the four key dimensions of sustainability: the social and institutional, the technical, the financial and the environmental dimensions.

### SOCIAL AND INSTITUTIONAL FACTORS

#### HEALTH AND SAFETY

*“The need to improve the working conditions of waste workers is a critical aspect in the social value chain development.” Jérémie Cavé (2015)*

As long as there remain occupational health and safety issues regarding municipal solid waste management, then these risks must be mitigated. Too often, the community members, including women and children, specifically those operating in the informal sector, don't have adequate health and safety protection equipment for performing their tasks. “The occupational health risks to waste pickers in developing countries are high because of manual handling and lack of protective clothing/equipment”<sup>6</sup>. Mexico City dumpsite scavengers were reported to have a life expectancy of 39 years, while that of the general population was 67 years (Medina, 2000, cited in David Wilson et al.2005).

The same applies to staff working in the ‘formal’ recycling sector, where protective equipment might not be adequate due to lack of financial resources or awareness of safety issues. Workers might be exposed to ill health or physical injuries from exposure to sharp or toxic materials, injuries from human error such as falls or contact with heavy machinery, and through indirect health impacts, such as the common example of inhaling toxic fumes leading respiratory illnesses.

There are however examples of projects where safety is rightly taken very seriously and where staff are being supplied with relevant protective equipment. This is the case of the composting projects led by Gevalor in Madagascar where staff are being provided with relevant personal protective equipment's and where air ventilation, hazardous material storage and ergonomic matters are being addressed. As Jocelyne Delarue<sup>7</sup> from Gevalor explains: “in two of our facilities, all the permanent workers receive vaccination, medical supervision and health insurance.” World Vision, and other NGOs should seek to advocate for, and implement, programmes so that these behaviours and conditions are normalised.

In many cases, it is difficult to distinguish between the health impacts that result from unsafe work conditions and poor standard living conditions. “Open burning of waste in dumps or in backyards constitutes another community health hazard. Proximity of waste accumulations to living space is often combined with low sanitation, poor personal hygiene and poor or non-existent urban infrastructure and health care services.”

#### A ROLE FOR EVERYONE

**Community Members:** It is undisputable that communities, both as individuals and in organized groups, have a critical role to play to make any municipal solid waste management business model successful. Community members can be decision makers, advocates, educators, enablers, customers and service providers in their own rights. The greater the role of the community in program development and execution, the greater the sustainability the project is likely to receive.

<sup>6</sup> David C. WILSON, Costas VELIS, Chris CHEESEMAN (2005) *Role of informal sector recycling in waste management in developing countries*. Elsevier, Habitat International

<sup>7</sup> Jocelyne Delarue, Director, NGO Gevalor.

### Dhaka, Bangladesh

In Dhaka, in the 90's waste contamination in streets and water courses became intolerable and communities took the initiative to start a community based waste collection system. Then key problems around solid waste were identified by the local communities who were able to propose practical bottom-up solutions which were more efficient than imposed solutions<sup>8</sup>. Community members were able to advocate for and enable change.

Waste collection started at the household level (at a cost) with rickshaw drivers collecting the waste. The initiative started in one area of the city and then gradually expanded to other areas in Dhaka city. In the late 90's various NGO's and private organizations such as Waste Concern started a monthly fee based door-to-door waste collection system in several residential areas in Dhaka. Households, specifically in low income areas of cities, also take a role in segregating the recyclable waste and selling those to 'waste pickers' operating under an informal system.

Community members should not be solely perceived as a tax payer, much can be learnt from communities who have the best understanding of the needs and shall be fully engaged in making decisions affecting their day to day lives. Communities have a critical role to play in informing the design of any project aiming to improve municipal solid waste management.

*"The official waste management system in many cities could not be managed without their myriad waste pickers, scrap collectors, traders and recyclers. Although not officially recognized, they often form the very basis of waste collection services, in many cases at no cost to local authorities, central governments or residents. Organically grown informal sector activities are highly adaptable, flexible and able to respond quickly to demand-driven forces." Peter GERDES et Al. (2010)<sup>9</sup>*

The informal sector is often located at the base of the pyramid of a waste recycling system. This results in waste collectors often earning a lesser income and being exposed to exploitation and unfair trading. Additionally, the involvement of families in waste collection programs can result in negative, unintentional outcomes such as children being removed from education as outlined in the quote below.

*"Individual scavengers/waste pickers are the most vulnerable as they do not have an organized supportive network. They have limited capacity for processing or storing materials and are easily exploited. Family organised activities are common in dump scavenging and in situations where waste collection is provided by the informal sector. This often involves vulnerable individuals such as women, children and the elderly and exposes them to increased health risks. It also often prevents children from having any chance of a formal education."<sup>10</sup>*

There are many environmental, social and economic advantages of recognizing the role of the informal sector, specifically by addressing perceptions and conflicts, but to achieve this it will be important to raise the visibility of waste pickers, to assist and facilitate them to raise their voices.<sup>11</sup> In some cases, municipalities have been able to provide subsidies and equipment in an effort to institutionalize the informal waste collection system, while in other cities formalised collectives have been able to receive municipal funded sub-contracts.<sup>12</sup> This assists waste collector through the knowledge of a stable income and secure, ongoing work opportunities.

<sup>8</sup> Atiq U. Zaman, Research Associate, School of Built Environment, Curtin University, Western Australia.

<sup>9</sup> Peter GERDES, Ellen GUNSILIUS (2010) The Waste Experts: Enabling Conditions for Informal Sector Integration in Solid Waste Management Lessons learned from Brazil, Egypt and India. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH Partnerships for Recycling Management

<sup>10</sup> David C. WILSON, Costas VELIS, Chris CHEESEMAN (2005) Role of informal sector recycling in waste management in developing countries. Elsevier, Habitat International

<sup>11</sup> Sonia Dias, Waste Specialist, WIEGO (Women in Informal Employment: Globalizing and Organizing).

<sup>12</sup> Omar Siddique, Senior Urban Specialist, Cities Alliance.

**Private Sector:** Unfortunately, the involvement of the private sector in municipal solid waste management in developing cities is not always welcomed and often seen as a nuisance or at best a ‘necessary evil’. “There is a general lack of trust between the informal sector and the private sector. In some cases the private sector does not necessarily trust the public sector, while elsewhere governments can be strongly opposed to the intervention of the private sector”.<sup>13</sup>

This sentiment can be partly attributed to the fact the term ‘private sector’ is often attached to large international corporations which at times might favor a top-down and north-south transfer type of approach. However, the ‘private sector’ must also be understood to include small local business enterprises. Furthermore, there is a very blurred line informal and ‘formal’ businesses. Here we refer to the private sector as for-profit businesses in general terms, whether small or large..

*“Opposition to the involvement of the private sector in the provision of public services can be expected in most situations. This may result from (i) political views, (ii) resistance to change, (iii) opposition from labour unions, (iv) fears about corruption, (v) fears of officials that they will lose power, influence or income, (vi) previous experience of private sector participation, (vii) a belief that private companies take huge profits, or (viii) other factors.” Adrian Coad (2005)<sup>14</sup>*

Trust and risk mitigation are at the center of private sector engagement. Below are some other critical requirements for successful private sector engagement.

Firstly, investing in the waste sector implies a strong understanding the local context so that any intervention is adapted and relevant to the needs. Secondly, the notion of risk management shall be fully integrated into any waste management business venture, not just at the financial modelling level, but also in terms of safety and environmental risk management.

**Local Government:** Local governments should be at forefront of waste management, as both a public service provider and in support of positive initiatives for improved waste management.

*“The local government is responsible for the collection and disposal of municipal waste. However, the local government has limited capacity to ensure adequate waste collection in the city – which results in one third of the city waste being uncollected.” Reflections from Atiq Zaman on the situation in Dhaka, Bangladesh.*

Waste collection and management is a basic public service that should be provided to everyone in an equitable manner. However, the reality of increased urbanization means that most cities in developing countries have grown so rapidly that their governments have suddenly found themselves unable to provide such basic services and with inadequate or outdated policy frameworks.

There are different ways for governments to play their role as the ultimate authority accountable for waste management and the way they operate as a direct provider of service or as a supporter of other operators, remains a key factor of success for sustainable municipal solid waste management models.

The role of local municipalities will differ significantly between where the private sector is and isn’t involved. “where private sector is involved from service provision to regulation, delegation to the private sector and monitoring of the service provided by private companies.”<sup>15</sup> This element is particularly important when it comes to developing contractual arrangement between the government and the private sector which shall be in favour of fair and equitable employment and reduced environmental impacts. There needs to be good preparation work when involving the private sector and specific attention should be given to the tendering and

<sup>13</sup> Mathieu Durand, Professor, University of Le Mans, France.

<sup>14</sup> Adrian COAD (2005) Private Sector Involvement in Solid Waste Management Avoiding Problems and Building on Successes. Collaborative Working Group on Solid Waste Management in Low- and Middle-income Countries

<sup>15</sup> Felix BUSSE (2012) *Financing waste projects, a challenging opportunity*. PROPARCO



contracting process (which should be as detailed and as balanced as possible) as well and include provision for comprehensive monitoring activities.<sup>16</sup>

When it comes to the political context, it is essential that the right legal instruments are in place to support the recognition of the informal sector, to encourage entrepreneurship in the recycling sector and to prevent any adverse effect on the environment.

**NGOs:** NGOs have a significant opportunity to demonstrate a value contribution in the solid waste management sector through: (1) policy and advocacy, (2) community engagement; and (3) business development facilitation.

1) *Policy and Advocacy.* NGOs can collectively influence governments so that rules and regulations protect children, youth and vulnerable communities, and support the dignified recognition of the people working in the informal waste sector. NGO's should advocate for child-wellbeing and the exclusion of children from all work. For those within the workforce, youths and adults, policy frameworks should provide for workers to be fairly compensated for their work, to be protected from likely risks of health and injury; and to have access to social protection mechanisms such as medical care. There are examples of cities where regulatory frameworks support the engagement of the informal sector by providing social and financial recognition.

In Lima, Peru, for example, there is legislation which includes the mandatory integration of the informal sector. Additionally, workers in the informal recycling sector are encouraged to form cooperatives and sometimes work in collaboration with the private sectors".

Another example is in Belo Horizonte, Brazil, where the city has played a key role in progressing waste management. The city provides support by financing and organizing sorting containers and training for waste collection. Brazil has made significant progress on policy frameworks in support of the informal sector and this has been very useful to continue and scale up projects. (Dias 2015)

2) *Community Engagement.* NGOs have long been efficient at engaging with communities. In the context of municipal solid waste management in developing cities, this can done at different levels and in seeking different outcomes. As explained by Christian Zurbrügg et al. (1999) , "Enhancing awareness and genuine participation in the planning, design, implementation, and evaluation phases are important prerequisites for establishing successful primary refuse collection schemes."

Partnering and collaboration shall be central to these activities. Secondly, the views of women should be specifically considered given that "with regard to solid waste management projects, women are key community members as they are responsible for maintaining a healthy and clean household and are directly affected by inadequate waste management at the household and community level" (Christian Zurbrügg et al., 1999) .

3) *Facilitating Value Addition.* While it is not necessary for NGOs to become business managers, there is a role for NGOs in supporting entrepreneurship in the waste sector, specifically targeting value addition for people that have been working the informal sector. In this role NGOs will likely specifically target certain at risk community groups: youth, women, minority groups, people with disabilities or other vulnerable communities.

*The role of NGO can be summarized as supporting the process of building equity in the solid waste management value chain. Atiq Zaman describes inequity in the waste management value chain with the most value being gained by the recycling or retailing business to the detriment of the waste collectors and small recycling business.*

<sup>16</sup> Adrian COAD (2005) *Private Sector Involvement in Solid Waste Management Avoiding Problems and Building on Successes.* Collaborative Working Group on Solid Waste Management in Low- and Middle-income Countries

## TECHNICAL FEASIBILITY AND VIABILITY

*“Sometime a grass root NGO approach can be challenging when a quick and technical decision needs to be made.”*

There is a spectrum of technical complexity from very low technological approaches to fully mechanised and advanced approaches operating globally in the solid waste management sector. In this paper it is suggested that in the context of solid waste management, ‘North-South’ transfers of business models and technologies should be avoided, unless thorough investigations are undertaken to ensure their suitability, adaptability and compatibility. In all cases, regardless of level of technological advancement being proposed, contextual factors should be considered when selecting the methods and technologies. Some of the primary factors that need to be comprehensively understood are:

- The existing level of infrastructure and processes in use;
- The current governance and legislative context;
- The type and composition of waste;
- The climate and environmental features;
- The availability of skills and equipment to maintain technologies (especially ‘imported’ technologies);
- The socio-economic context of the target population; and
- The potential for market development of any proposed product stream.

These factors will help to develop an accurate understanding of why things are being done the way they are. This is critical when it comes to building sustainable business models for solid waste management.

In the case of waste collection services for example “what matters is whether the waste is being collected in an efficient, hygienic and reliable way. It is important to focus on the results and not the method.”<sup>17</sup> If it works with wheelbarrows, it is not necessary to bring a high-tech truck which will not get through narrow streets, and will be difficult to operate and maintain. In such cases, improvement can be done simply by optimizing the number or quality of the equipment or adjusting the pick-routes and frequency of collections.

*“In many cities, manual methods, using handcarts or small vehicles, provide a much better service than what could be provided using large and sophisticated compactor trucks.” (UN Habitat, 2011)*

The same principles apply to the final disposal of waste, for example, “incineration for energy recovery can be a costly capital investment for most communities in the developing world, pose societal and environmental health risks if misused (e.g., burning toxic wastes causes harmful air pollution), and shows a less positive energy balance than transforming material via recycling”.<sup>18</sup>

<sup>17</sup> Adrian COAD (2011) Collection of municipal solid waste Key issues for Decision-makers in Developing Countries. UN Habitat.

<sup>18</sup> Alexis M. TROSHINETZ, James R. MIHELIC (2008) Sustainable recycling of municipal solid waste in developing countries. Elsevier.

## CONSIDERATIONS FOR FINANCIAL SUSTAINABILITY

To ensure financial sustainability of waste management interventions there are two primary potential income streams: (i) service delivery fees; and (ii) the sale of the final product stream.

(i) Service Delivery Fees. Setting the right price is critical to ensure that all costs can be covered. When setting the price of waste collection services for example, Mathieu Durand<sup>19</sup> notes the importance to accept what he calls a 'differentiated model'. For example, in Bogota, the city is divided into six areas according to the socio-economic level of the inhabitants. Each area financially contributes to basic services in accordance with their socio economic level. At this stage, this applies to water and sanitation but this could also apply to waste management. Case studies show that even the poor are often ready to pay the right price for quality services and products.

(ii) Product Stream Income: any stakeholder initiating business development in waste sector, whether it be a private company, the 'informal sector' or a community based organization, needs to clearly understand the target market and the nature of their supply chain. Programs will not be able to develop as a viable recycling business without first taking the time to investigate their market. There are potential markets for recycled products generated through solid waste management schemes. However, effort will be required to fully identify them, understand the markets and to ensure that the product is marketed in a suitable manner to maximise the available market.

For example when, chemical fertilisers are still the preference of farmers, even though organic compost can display an equivalent if not better quality, there has been a failure to either understand the fertiliser market or a failure to adequately promote the organic compost product. These challenges can usually be overcome through comprehensive marketing strategies but also through education and advocacy.

There continues to be debate around whether specialisation in a single stream or product, or developing multiple product streams are better project models.

## ENVIRONMENTAL IMPACT MANAGEMENT

There are obvious environmental benefits that result from improved waste management. Improved levels of collection can reduce the volume of solid waste that pollutes the natural environment. This is achieved most when point of generation waste collection occurs – either through formal municipal led services, or collection for fee services provided among informal communities by informal waste collectors. The informal sector access areas that are often neglected by local authorities. Uncollected waste is not only unsightly, it also contaminates the air, land and water, it can sometimes lead to flooding from blocking drains and has subsequent direct and indirect<sup>20</sup> health consequences, specifically on the most vulnerable as we have explored earlier. When left uncollected this waste ends up contaminating waterways, and contributes significantly to the global environmental health burden.

However, minimisation, collection and recycling can be efficient. Within the solid waste management sector the first priority will continue to be to advocate of waste minimisation and behaviour change, the second priority must then be the collection and source separation of waste at the site that it is generated before it enter the public sphere/environment. The best approach to enabling high levels of recycling or organic composting is to ensure that these streams are kept separated from non-recyclable, inorganics from the start.

When considering the potential impact of recycling activities, Peter Gerdes reflected that “the informal sector achieves high recovery rates (up to 80%) because the ability to recycle is vital for the livelihoods of the people

<sup>19</sup> Mathieu Durand, Professor, University of Le Mans, France.  
<sup>20</sup> Contaminants accumulate in the food chain.

involved. Several studies have shown that these informal recycling activities have positive effects on the environment.”<sup>21</sup>

In the case of composting, Jérémie Cavé indicates that “Waste composting has a strong positive environmental benefits in different ways: it reduces the tonnage of waste going to landfill, it improves the quality of agricultural land and it can contribute to the generation of carbon credits, adding value in response to global climate issues.”<sup>22</sup>

In Dhaka, Bangladesh Waste Concern, a NGO processed 124,400 tons of organic waste during 2001-2006 as a part of the public-private waste management initiatives and produced 31,100 tons of compost at a value of USD 1.1 million. In addition, the project created 986 direct jobs and reduced 10,800 metric tons CO<sub>2</sub>-equivalent emissions<sup>23</sup>.

Improved environmental outcomes are not only achieved through waste collection or recycling process, improved processes for the final disposal of waste can also reduce the negative impact on the environment. Suitably designed sanitary landfills can ensure that waste and the subsequent leachate can be contained and thus prevent contamination of local ecosystems.

Despite the above examples demonstrating positive environmental impacts, some initiatives can unintentionally have an adverse effect on the environment. Therefore, thorough environmental impact assessments should be conducted for any solid waste management projects of any scale to prevent detrimental impacts.

## FUTURE PLANNING TO ACHIEVE THE SUSTAINABLE DEVELOPMENT GOALS

Based on this paper there are three key messages that could be included into the discussion that will form the lead up to Habitat-III.

### **1) Safety comes first**

The health and safety of people engaged in the sector has to be the primary concern for any projects.

### **2) Waste is a livelihood opportunity**

There are opportunities for economic development and value adding in the waste sector of developing cities, these should continue to be explored in a collaborative and inclusive manner to ensure better equity along the value chain of municipal solid waste.

### **3) The need for coherent and enabling policy frameworks at all levels**

Public policies need to be developed, adapted and harmonized at international, national and local level to support waste management projects and to ensure their viability.

## KEY PRINCIPLES FOR AN IMPROVED FRAMEWORK

In an attempt to proceed towards the development sustainable business models for waste management in developing cities, World Vision has defined a number of key principles that must be considered, although we don't pretend the list is exhaustive and we welcome suggestions for additions.

<sup>21</sup> Peter GERDES, Ellen GUNSILIUS (2010) The Waste Experts: Enabling Conditions for Informal Sector Integration in Solid Waste Management Lessons learned from Brazil, Egypt and India. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH Partnerships for Recycling Management

<sup>22</sup> Jérémie Cavé, independent consultant in urban ecology, France.

<sup>23</sup> Centre for Clean Air Policy, Tackling Waste through Community-Based Composting, available at [http://ccap.org/assets/CCAP-Booklet\\_BangladeshCompost.pdf](http://ccap.org/assets/CCAP-Booklet_BangladeshCompost.pdf)

**Inclusiveness:** Approaches must be inclusive, encourage participation of all actors and be relevant to the needs of all people, women and men, girls and boys with specific attentions given to people working in the informal sector and the most vulnerable being children and their mothers. “The concept of child participation is an essential component of Article 12 of the Convention on the Rights of the Child, which explicitly affirms a child’s right to express an opinion, to be listened to and to participate in decisions that affect his or her life.”<sup>24</sup>

**Collaboration:** Collaboration between the different actors and different projects, including between the activities of waste collection and the activities of value addition (recycling and composting for example) is critical to ensure the sustainability of projects.

The lack of collaboration often resulting in poor effectiveness subsequent environment, social and economic impacts as explained Omar Siddique<sup>25</sup>, while reflecting on the situation in Monrovia, Liberia: by “There are challenges with the project as the primary waste collection system are being managed by one actor and the secondary collection is managed by another actor. The lack of connectivity between the two projects results in back log of waste at the primary collection level – the secondary system not being at the right scale.”

**Integration:** In this context, integration does not mean ‘doing everything for everybody’ as the multi-actor and dynamic urban context does not necessarily lends itself to a fully integrated approach, but it means establishing linkages with other projects and sectors so that value creation can be shared and multiplied.

**Flexibility:** Cities offer a dynamic and rapidly changing environment which is unlike the rural context where a large part of developmental actors have been focusing their attention to. In cities, improvement projects, including in the waste sector, must be able to adjust to rapidly changing conditions.

**Context specific:** As we have been able to comprehend during this research, understanding the context is fundamental when it comes to working towards sustainable municipal solid waste project models. This includes the political, the social, the technical and the biophysical context.

**Safety:** Safety should remain the priority consideration when promoting employment and participation in the waste sector. Much can be learnt from the private sector, specifically from high-end industrials that have implemented and been certified to Safety Management System Standard, but common sense also applies.

**Market driven:** Without a market, there is no business for waste collection and recycling. Customers must want a product (recycled) or a service (waste collection) and be ready to pay for it. It is critical that adequate time and resources are spent on researching and analysing the market at the onset of waste value adding projects.

**Continuous learning:** Actors in the sector shall have learning, evaluation and monitoring mechanisms and relevant documentation tools to continuously capture lessons from their own work as well as from others. This enables the development of skills and knowledge which can be capitalized on for further programs.

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<sup>24</sup> Patricio CUEVAS-PARRA (2014) Just Cities for Children: Voices from Urban Slums. World Vision International

<sup>25</sup> Omar Siddique, Senior Urban Specialist, Cities Alliance.

## CONCLUSION

The global challenge of solid waste management can and must be addressed in such a way as to reduce the public health risks being faced by vulnerable communities; also to reduce the global environmental burden, and concurrently to provide opportunities for livelihood development and job creation through both improved service delivery and through reuse and recycling businesses.

Much can be done to reduce the negative impacts of poor solid waste management; to improve workers conditions and protection; and to add value in the waste sector. This will require all actors, including the private sector to work in a collaborative manner, to share a clear understanding of roles and responsibilities, and to embrace new ways of working.

In such context, NGOs can no longer afford to play a traditional role in which fund and equipment transfer mechanisms dominate. NGOs must first understand the context in which they operate and the local behaviours and values attached to solid waste. Their contribution to a sustainable waste model in developing cities is best achieved through adopting a 'softer' approach to development, being an advocate, a partner, a convener, a capacity builder and a facilitator; rather than their traditional role as an implementer. Special attention is required to ensure that children and youth are adequately considered, and protected in the future solid waste management sector. Children should be protected from exposure to solid waste, and especially should not be working as child waste collectors on dumpsites. Similarly, youth who are entering the workforce will require specific attention, training and protection.

Eight factors that will need to be integrated into urban solid waste management programs to achieve justice, safety, and financial viability will be: inclusiveness, collaboration, integration, flexibility, context-specific, safety-driven, market-driven and adopting a continuous learning posture.

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