



Grant Agreement number: 244188 (IWWA)

Project acronym: IWWA

Project title: Integrated Waste Management in Western Africa

Funding Scheme: CSA-CA

### **Work Package 4**

#### **Elaboration of Policy guidelines and recommendations**

Deliverable 4.1: 'Report: Description and evaluation of policy measures'

Due date of deliverable (4.1): 30.06.2011

Actual submission date: 12.08.2011

Start date of project: 01.06.2010

Duration: 24 months

Organisation name in charge of deliverable 4.1: BCRC, Nigeria

Project coordinator: ttz Bremerhaven, Germany

Project website address: <http://www.iwwa.eu>

<b>Project funded by the European Commission within the Seventh Framework Programme (2007-2013)</b>		
<b>Dissemination Level</b>		
<b>PU</b>	Public	<b>x</b>
<b>PP</b>	Restricted to other programme participants (including the Commission)	
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## 1. INTRODUCTION

This deliverable sets the principles on which best policy options are based. It starts from the barriers and obstacles to waste management identified in Task 2.5 and described in Deliverable 2.1, and goes on to highlight the best policy measures to adopt in the 4 target countries.

In WP 2 and 3, institutions, policies, laws regarding ISWM on a regional, national and international level were reported by the four target countries. To prepare future plans and policies (laws, guidelines, regulations, directives, rules, standards etc) there is need for the analyses of the strengths, weaknesses, constraints, threats and prospects of the existing SWM management policies and institutional/regulatory frameworks in the targeted countries. In this report we analyse and describe policy options, aiming to build on the strengths and overcome the weaknesses of the current waste management system, in order to provide a basis for ISWM in the four target countries

## 2. BARRIERS AND BEST POLICY OPTIONS

### 2.1. Lack of good governance: Missing of coherent ISWM legal framework

There are three key aspects to be addressed as “inadequate ISWM legal framework”. These points have to be applied for all of the target countries in West Africa:

1. CONCEPT OF ISWM NOT WIDELY ACCEPTED: “The concepts of Integrated Waste Management are not widely acknowledged in the target countries, i.e. waste management is not seen as a total system from generation, through collection, treatment to reuse and recycling or disposal” (see D 2.1, section 2 and especially section 4).

2. CURRENT LEGISLATION DOES NOT SUPPORT PRINCIPLE OF ISWM: Consequently, a central piece of legislation laying down the principles of waste management for a broad range of waste streams - like the Waste Framework Directive in the EU - is missing. Moreover daily practice, guidelines and decrees are missing. Secondly concrete advice and mandatory regulation on how general terms for waste management shall be implemented in detail (see D. 2.1). Guidelines have an important job for target groups like administration or plant operators to concretise legal requirements. However without any mandatory effects there is less possibility to obligate the stakeholder to assume their responsibility. Thirdly a consistent regulation is missing for the whole waste sector. There exists regulation for special waste streams (e.g. from hospitals or veterinary institutions) with special environmental impacts or special impairments of health in some of the target countries. Regulation entered into force on different governmental levels (national, regional, municipal) but without concretised responsibilities regarding the certain levels.

Connected with the lack of waste legislation is also the lack of long-term planning and systems thinking in the aspect of waste management (see D 3.3, section 4.6.1.2).

3. WEAK EXISTING LEGAL FRAMEWORK WILL HINDER IMPLEMENTATION OF NEW REGULATIONS ON ISWM: If waste regulation would enter into force this will give rise to another problem: Enforcement of the existing waste regulation will give rise to another problem. The evaluation of the situation in the different countries has figured out the urgent need for the enforcement in principle (or at least better enforcement in several cases) of existing waste regulation. To give an example: Existing sanctions in many cases are not executed by responsible authorities. Furthermore it should be mentioned that several waste laws of the target countries are not up to date (e.g. in Senegal, see D 2.1 section 1.3; but as well there are several examples for Nigeria, Ghana and Ivory Coast). There are missing requirements in line with possible modern

technologies e.g. for recycling or recovery of energy. Another issue to mention is that in several cases the wording of waste regulation remains unclear (e.g. the “Law providing for the Environmental Code” in Senegal which includes the legal term of the “ecologically sound management”). The law contains indefinite legal concepts which are difficult (or even impossible) to implement into administrative proceedings.

Future efforts to establish a legal framework for the waste management should take into account several important requirements. First of all a structured and homogeneous waste law consisting the basic principles (basic law) is necessary as well as specific requirements (special law). Basic law and special laws (specific laws) are connected by legal references. The basic law should establish the main principle of life-cycle management and regulate the most important waste management principles (prevention, re-use, recycling and disposal of waste), important general objectives of waste regulation (especially avoidance of environmental impacts), legal terms, the scope of application, general provisions for responsibilities, structuring the licensing system, assumptions for different licenses, collection/transportation principles and sanctions for irregularities.

In addition the special requirements shall focus on:

- The different waste streams (e.g. E-waste, plastic waste, organic waste, commercial waste, packaging, industrial, healthcare etc.);
- special assumptions for the waste disposal (landfill sites);
- the financing of public and private responsibilities.

These matters could be established by special waste regulation but under the above mentioned basic principles.

To ensure the enforcement of the law, there has to be specifically assigned responsibilities to each level of governmental as well as the assignment of responsibilities for public authorities towards the private sector.

### 2.1.1 Discussion of best policy option(s)

From the above analysis of the legal framework regarding ISWM in the target countries, the following are being proposed to be included in the legal instruments governing solid waste management in the target countries.

#### **Substance ban legal instruments**

Substance bans in terms of solid waste management are defined as restrictions imposed on disposal, transfer for disposal and contracting for disposal of certain hazardous and recyclable solid waste items.

These substances which are banned from disposal as normal solid waste are usually listed in national legal instruments or international instruments that the country concerned has signed onto. An example is the Bamako Convention which banned certain types of wastes not to be dumped, transferred, stored or exported to other member countries of the erstwhile Organization of African Unity (OAU), now the African Union. Among the four target beneficiary countries of IWWA project, only Senegal and Ivory Coast have signed and ratified this important convention.

#### **Policy recommendation**

Voluntary agreements by multinational companies

This is a common approach to pollution control. It entails establishment of laws requiring firms to cut emissions. Voluntary agreements are agreements reached between multinational companies and governments of developing countries as well as that of industrialized countries for the companies to cut down on their emissions. Voluntary regulation, by contrast, provides incentives—but not mandates—for pollution control. The three main types of voluntary regulation are:

- Environmental agreements negotiated between regulators and industry,
- Public programs (administered by regulators or third parties) that individual firms are invited to join, and
- Unilateral commitments made by firms (Lyon and Maxwell 2002).

In industrialized countries, such regulation has become quite popular (OECD 1999, 2003). Less well known is that environmental authorities in developing countries, particularly those in Latin America, also have embraced this approach and are rapidly putting initiatives in place.

In the four target countries, voluntary environmental agreement with multinational companies and government and its agencies is a new concept. It is within this context that the following proposal is being made to include voluntary environmental agreement with multinational companies who export electronic waste and other solid waste streams that are generated in the target countries.

There are several reasons why multinational companies may want to enter into voluntary agreements with governments of the target countries. These are:

- to prevent introduction of stringent mandatory regulations on waste or to soften enforcement of existing regulations (Maxwell et al., 2000).
- to get tax breaks or holidays for environmental investments, technical assistance with pollution control and prevention.
- to boost their market sales in markets where buyers are concerned about environmental performance (Arora and Gangopdhyay, 1995).
- To focus on private financial incentives because pollution control prevention can lower their production costs.

Policy strategies for entering into voluntary agreements with multinational companies on SWM by governments of the various target countries.

It is important for governments of the target countries to ensure that the principle for voluntary agreements is based on the fact that environmental management is part of the country's business. This principle can be enshrined in laws governing waste regulation or their national constitutions'. For example, article 41 (k) of Ghana's 1992 Republican constitution states in clear terms that "*it is the duty of every citizen of Ghana to safe guard and protect the environment*".

It is also important for them to note that voluntary agreements have no binding effects on either party and hence adequate measures must be put in place to ensure its compliance.

The parties that will be involved in the target countries are to commit themselves to the following:

#### 1. Environmental diagnosis

- conduct a study of environmental problems in the relevant sector and/or region, or validate an already-completed study;

- in some cases, conduct a complementary study of a specific problem (for example, of hazardous wastes in the electricity sector) or a study meant to provide a baseline for quantitative commitments; and
- update the diagnosis during the course of the VA.

## 2. Institutional strengthening

- create an environmental management department in the signatory trade association and/or individual firms;
- promote the adoption of environmental codes of conduct and environmental management systems in the signatory firms; and
- develop capacity-building programs and projects for professional staff of regulatory institutions and/or signatory firms.

## 3. Production processes

- promote the development, domestic and international transfer, and adoption of pollution prevention techniques, including cleaner technologies, cleaner energy sources, and the recycling and reuse of residuals and discharges
- promote increased use of pollution control devices;
- promote water conservation; and
- develop contingency plans for environmental risks.

## 4. Legal and technical norms

- comply with specified norms in a specified time period;
- obtain all requisite licenses and permits;
- substitute out of fuel sources that are prohibited by law;
- use only licensed providers and transporters of production inputs;
- respect compliance plans already negotiated with the regulator; and
- facilitate private sector input into the design and implementation of new regulations and the revision of old ones.

## 5. Education and research

- establish an annual agenda for capacity building among private firms;
- promote interactions with, and relevant research at, local universities;
- participate in an annual “ecology week” educational event;
- promote educational programs and projects in local communities; and
- establish or strengthen local clean technology centers.

## 6. International cooperation

- promote the exchange of information with international institutions and firms.

## 7. Financing

- create economic incentives for firms to adopt cleaner technologies;

- promote lines of credit to facilitate the adoption of clean technologies; and
- identify sources of finance for the activities in the VA.

#### 8. Monitoring and evaluation

- formulate and implement mechanisms to monitor and evaluate environmental performance;

#### 9. Special management zones

- take into consideration floodplains and other high-risk zones in land-use decisions; and
- develop programs and projects to recover rivers and riverbanks and develop recreational areas.

### **Extended Producer responsibility (EPR)**

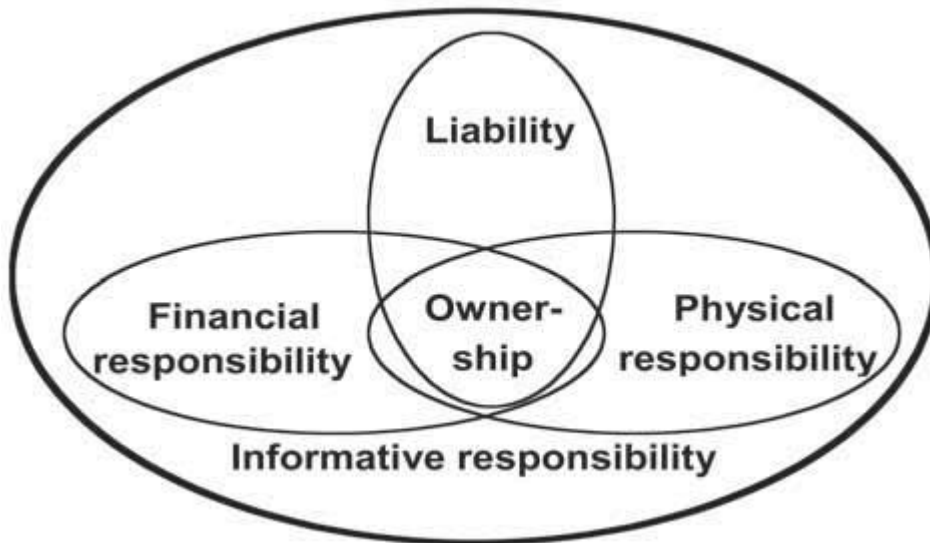
Lindhqvist (2000) defines EPR as follows: *“a policy principle to promote total life cycle environmental improvements of product systems by extending the responsibilities of the manufacturer of the product to various parts of the entire life cycle of the product, and especially to the take-back, recycling and final disposal of the product. A policy principle is the basis for selecting the mix of policy instruments that are to be used in the particular case. Extended Producer Responsibility (EPR) is implemented through administrative, economic and informative policy instruments.”*

This definition reflects three cornerstones of EPR, namely the ‘pollution prevention approach’, ‘life cycle thinking’ and ‘polluter pays’ principles. In addition, it is broader than the definition used by the OECD (2001) – *“an environmental policy approach in which a producer’s responsibility [financial and/or physical] for a product is extended to the post-consumer stage of a product’s life cycle”* – in the sense that the extended responsibilities of a producer are not only limited to the end-of-life stage but also to other stages of the product life cycle where the conventional responsibilities are deemed insufficient to guarantee optimal environmental protection.

To date, EPR has been applied in OECD countries and has focused mainly on the end-of-life stage, *“the ‘weakest link’ in the production responsibility chain”* (Kroepelien 2000). It is within this context that before the governments of target countries incorporate the extended producer responsibility into their domestic waste laws, they need to understand the various types of the extended producer responsibility.

### **Types of Responsibility**

The extension of responsibilities to manufacturers varies between EPR programmes, both in terms of types of responsibility, as well as activities to be undertaken. Figure 1 provides a classical typology of responsibilities, introduced by Lindhqvist in 1992.

**Figure 1** Model for Extended Producer Responsibility (Lindhqvist, 1992)

According to Lindhqvist (2000), there are four types of extended producer responsibility. These are:

- “Liability refers to a responsibility for proven environmental damages caused by the product in question. The extent of the liability is determined by legislation and may embrace different parts of the life-cycle of the product, including usage and final disposal.
- Economic (Financial) responsibility means that the producer will cover all or part of the costs for e.g. the collection, recycling or final disposal of the products he is manufacturing. These costs could be paid for directly by the producer or by a special fee.
- Physical responsibility is used to characterize the systems where the manufacturer is involved in the actual physical management of the products or of the effects of the products
- Informative responsibility signifies several different possibilities to extend responsibility for the products by requiring the producers to supply information on the environmental properties of the products he is manufacturing (e.g. to recyclers).”

### **The Role of the Government**

Even though many governments around the globe have already enacted legislation to regulate the management of WEEE - or are awaiting forthcoming legislation - the issue of mandatory and voluntary EPR programmes is still worth revisiting to establish a rationale for government intervention by showing that one can reinforce the other. It is true that EPR is a market-based principle and draws invaluable lessons from existing voluntary practices in the business world. However, the government intervention can provide a springboard and give leverage to the strategic transformation. In fact, some so-called ‘voluntary’ programmes are a response to pre-empt legislation rather than a pure business initiative. This implies the possibility of various degrees of intervention. Regardless of the form of intervention, to provide any leverage an intervention must be designed to reward the good, e.g. innovators, and punish the bad, e.g. free-riders.

In addition, it is important that a government sends a clear and consistent signal to the targeted industries once it determines to intervene, in order to trigger positive anticipatory behaviours.



## **Enforcement and dissemination mechanisms for solid waste laws in the target countries**

One of the critical challenges facing the target countries with regard to solid waste management is lack of enforcement of laws on solid waste. There is a need for advocacy, education and awareness amongst all stakeholders including the public at large, the three spheres of government, and the private sector. Different role players will fulfil different functions in respect to the respective target audience.

The effectiveness of many waste measures, particularly those aimed at waste reduction and recycling, depends to a significant extent on public and consumer awareness. Awareness of and responses to waste issues are very uneven across different communities in the target countries, and there is a clear need for high-profile state-led public awareness campaigns to support initiatives in relation to littering, as well as to promote a general awareness of waste issues.

The content of such campaigns and their alignment with possible waste delivery measures such as separation at source needs careful consideration.

There is also a lack of awareness of the importance of waste management amongst elected representatives and government officials, particularly at local government level. This has negative consequences for planning, personnel and budget allocations. Amongst other measures, there is a need for training of local government agents/members of parliament and other government functionaries on waste management issues.

The increased involvement of citizens in oversight of waste delivery services provides an important avenue for raising public awareness of waste management issues. Similarly, the “Cleanest town” competition has potentially an important role to play in advocacy and awareness.

Schools have a particularly important role to play in advocacy and awareness around waste issues. Existing recycling initiatives in schools need to be supported and extended, although the fund-raising potential of these initiatives needs to be realistically framed. The sector ministries in charge with waste management need to assist the Ministry of Education in ensuring that waste management is integrated into school curricula and management.

### **2.2. Lack of good governance: Missing of coherent organizational structure regarding ISWM**

As stated in the conclusions of Deliverable 2.1., Section 4, in all the four countries studied within IWWA, there is a proliferation of institutions in charge of monitoring the implementation of SWM (Ministries at the national level and also at the state level in the case of Nigeria, directorates, agencies...) which is disproportionate in comparison with the very limited means available to the actors that are in charge of implementing SWM on the ground: municipalities and even more, small and medium enterprises (SMEs) and the informal sector.

This proliferation of institutions will inevitably lead to coordination problems, overlapping in terms of responsibilities and dilution of accountability, and, given the very limited results in terms of service provided to the beneficiaries and environmental protection. This will, in the end, represent at the end of the day an inappropriate investment of public money.

In addition, although SWM is in all the 4 countries, a responsibility of municipalities (except for Ivory Coast), they still rely a lot on the central government, in particular regarding financial means. For instance, SWM in Dakar is subsidized by the government. Ghanaian metropolises except Accra are in the same situation. These financial circuits are not sustainable.

Last but not least, centralized management of solid waste means that authorities have to look for big industrial solutions to treat big quantities of waste, which inevitably favours giant sanitary landfills or more recently biogas plants with heavy investment, operation and maintenance costs. These industrial solutions provided might be seducing from a technical point of view yet they create few jobs, whereas unemployment especially of the youth is a major concern in Senegal, Ivory Coast, Ghana and Nigeria.

So, a more bottom-up approach, which will be more cost-effective, labour-intensive and more manageable given the limited means, is needed. This requires a deep revising of the organizational structure of SWM in Western African countries.

### 2.2.1. Discussion of best policy option(s)

A bottom-up and inclusive approach implies that organised informal sector and local SMEs should be granted a central role in SWM

As UN-Habitat puts it in its latest report on solid waste management issued in 2010, a good public policy consists in building on what already exists, and to ensure that what already works continues to work, and improve all that does not work.

What already works in terms of waste management in Western Africa is the organised informal sector. It works because it collects and separates recyclable materials with a very competitive value for money ratio, provides incomes for thousands of people and makes waste management services affordable even to the low income population. In the 22 reference cities studied by UN-Habitat, it is estimated that *“Informal recyclers divert 15 to 20% of the city’s recyclables, which translates to savings in its waste management budget by reducing the amount of wastes that would otherwise have to be collected and disposed of by the city. In effect, the poor are subsidizing the rest of the city.”*

Of course, the way the organised informal sector operates needs to be improved especially to scale up the technologies used (collection vehicle, recyclable materials separation and compacting equipment...) in order to improve the working conditions and to reduce negative impacts on the environment.

The role of the organised informal sector is being increasingly acknowledged by the United Nations, the German cooperation (GIZ) and a variety of public authorities on all continents: for instance, in Colombia, the Constitutional Court has issued several decisions to recognize the role of informal recyclers and request municipalities to carry out “affirmative actions” i.e. to help them to understand public procurement rules and get access to public delegation contracts, which implies active collaboration of municipalities with the organised informal sector and local SMEs.

Municipalities have a major role to play in SWM especially now with the increasing privatization in terms of public procurement for waste collection and waste treatment services.

The current situation in Western Africa is that, with the notable exception of semi-urban or rural areas (where multinational companies have not invested yet), municipalities tend to trust foreign multinationals or major national companies pertaining to foreign owned groups because those companies have Western-type waste collection, transportation equipment and treatment infrastructure. However, as UN-Habitat states in its 2010 report on SWM in Southern cities, *“[waste management] modernization is not necessarily motorization”*.

UN-Habitat stresses the fact that municipalities should therefore recognize that *“the informal sector is clearly any city’s ally”* because of its ability to recuperate and valorise waste: “every tonne of

waste reduced, reused or recycled is a tonne of waste for which the city does not have to pay for its transport and safe disposal”.

Municipalities should concentrate their efforts on:

- reinforcing technical and organizational capacities of the organised informal sector and local SMEs:
- help informal service providers to get access to adequate collection, transportation equipment such as protective devices, robust vehicles and ergonomic machines;
- provide organised informal waste recyclers with space to store and separate recyclable materials. This will enable them to scale up their activity, to improve their efficiency and to sell larger quantities to local industries.
- organise health prevention campaigns targeting informal waste recyclers to sensitize them on the dangers of some practices of recuperation of recyclables (dismantling, burning...)
- carrying out micro-privatization programmes which imply sub-contracting a wide basis of private actors and not just a handful of major companies. At the sub city or neighbourhoods level, municipalities' responsibilities should be to articulate :
- waste pre-collection carried out by informal service providers (youth or women groups, associations...) that can be either paid directly by the households or by the city (but generally they prefer to be paid directly by the household unless the municipality provides them concrete advantages such as social protection),
- and waste collection carried out by formal service providers paid by the city.
- organising sensitization campaigns with the inhabitants to explain the issue of waste, public health, environmental protection and dignify waste-related employment.

**Central governmental bodies should concentrate on strategic activities consisting of:**

- producing reliable, precise data on waste characterization and trends, so as to be able to adapt legislation and regulations to the quickly evolving consumption patterns;
- ensuring coherence of SWM policies with other policies such as industrial and economic development policies;
- ensuring enforcement of national legislation and international conventions, which implies not only controlling and fining but also training actors;
- promoting waste separation at the source and set up financial incentive for major waste producers (“pay as you throw” systems). The incentive can consist in charging them proportionally to the volume of non-recyclable waste they throw, so as to motivate them to give their recyclable materials to organised waste recyclers.
- increasing taxes on imported plastics, metals, paper and cardboard so as to make recycled materials more competitive and foster local economy.

### **2.3. Lack of good governance: Relation between local authorities and policy environment**

The barriers discussed earlier concerning the relation between local authorities and the policy environment indicated that various models for SWM in the target countries, although valid in theory, have not been satisfactory due to incomplete practice of “good governance” despite certain

successes. The indicators of the weak relation between local authorities and the policy environment are re-iterated in the following section with a discussion of best policy options specifically for the key barriers faced.

### 2.3.1. Discussion of best policy option(s)

Generally the directions of each country to strengthen the link between local authorities and the policy environment are commendable but need policy improvement as discussed below. One exception however is Cote d'Ivoire where a recent policy adopted for SWM should be advisably changed altogether since it is rather aiming to centralize functions of the SWM systems.

- In Ghana the policy of decentralization to the local assemblies, embodied in the relevant Acts of 1993 and 2003 is commendable but has not been translated effectively into action. Therefore, policies must ensure that such transferring of functions to the assemblies must always be accompanied with a program of transfer of know-how needed to fulfil these functions and mandates, which should be a prerequisite to decentralization.
- In Nigeria local governments are excluded from participating in the legislative review process. A policy must be in place to ensure that any amendments in SWM legislations and regulations cannot be formulated without the active participation of the local governments. To ensure effectiveness of such a policy, if needed, a capacity building project must be implemented to enable effective participation in policy formulation and implementation.
- In Senegal, one of the key pending issues is that there is no clearly defined budget allocation to the local governments throughout Senegal. As a starting point, policies should be in place to empower the existing Entente CADA-K-CAR acting on behalf of the local governments in the region of Dakar for the financial management of the SWM systems. Policies to avoid conflicts of interest must also be in place to ensure equitable allocation of funds such as the case of the Mayor of Dakar found heading the Entente CADA-K-CAR.
- In Cote d'Ivoire, policy makers have evidently encouraged centralization of the SWM system and privatization is underway since 2007. A policy should be in place however to ensure that cities are participating in the formulation of SWM laws and regulations and in drafting the terms set for the private companies that will be contracted for SWM services or building infrastructure despite the centralized governance by the Ministry of Cities and Urban Salubrity. This prerequisite participatory planning is needed to ensure proper tailoring to local conditions and participation in monitoring and evaluation as well so as to continue refining policies constructively and with a participatory planning approach.

### **2.4. Lack of good governance: Implementation of Policy through Public Participation**

Reports from reviews in the four African countries show that there is no clear provision for public participation in the policy making processes. However, drawing on the international law of public participation in Environment and Development, the essence of developing a viable legislative framework for public participation in the target countries cannot be over-emphasized. A viable legislative framework must take into account the various factors that shape the effectiveness of participation and the elements that promote the objectives of participation. This is premised on the ground that looking to international prescriptions might help to elucidate gaps in domestic laws, as well as alternatives to overcome them.

Public participation in the policy making process therefore is imperative to the development and implementation of an effective waste management plan in the target countries. This is underscored by Principle 10 of the Rio Declaration on Environment and Development which states that environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy shall be provided.

#### 2.4.1. Discussion of best policy option(s)

Different policy measures can be adopted for the engagement of stakeholders in the decision making process in order to take into account their problems, priorities and points of view. This should be used to increase the opportunities to bring a project, plan or legal framework to fruition.

Information, education and communication programmes for the citizens can play a key role in helping to attain SWM objectives through its ability to provide knowledge and information on important ecological and solid waste management concepts, effects individual and collective action as well as to promote and/or reinforce social norms.

These programmes should focus on ISWM promotion and hygiene and health education and should take the form of dissemination and information campaigns aimed at positively influencing attitudes, behaviours and beliefs. Attempts to educate and mobilize society to segregate recyclables have not yet produced satisfactory results and should be also on focus.

These campaigns will also promote the creation of demand for ISWM; demand for ISWM is created when end-users have motivation, opportunity and ability to implement systems of SWM which suit their needs in a sustainable way.

Public education campaigns using the **media, advertisements and communication methods** can contribute to the efforts to decrease the burden of solid waste. Since different countries have different levels of experience in this field, the exchange of experiences through working group discussions will help all parties achieve the desired outcomes. An example of this is the “Sweep-net” (The regional solid waste exchange of information and expertise network in Mashreq and Maghreb countries) which is a regional network whose objective is to set-up a common regional platform for technical assistance, capacity building and exchange of best practices, expertise and experiences in the field of Solid Waste Management.

**Social marketing** strategies have proven to be effective in promoting behavioral changes related to different fields. The application of marketing principles and techniques to promote a social cause, idea or behaviour has been effectively used in many projects. Information on knowledge, attitude and practice or behaviour can be obtained by KAP surveys. There are guidelines provided by the WHO with structured and standardized questionnaires. KAP surveys permit to identify factors influencing behaviour that are not known to most people, reasons for their attitudes, and how and why people practise certain health and SWM behaviours. Their results enable to detect relevant points to be strengthened in the education programmes.

**Integrated waste management forums or platforms** with the participation of the civil society and regional and national authorities have great to bring together stakeholders and unite them under a common goal in order to incorporate those actors who are usually left outside the decision-making

process and promote good practices that can improve the efficiency of the SWM services provided. These platforms can also function as a “think-tank” for social marketing implementing ideas, concepts and approaches

Moreover, this kind of activities carried out in the different regions of a country permit that the policies and the participatory planning are geographically and culturally sensitive since every area and community has different needs, priorities and practices. The City of Cape Town captured over 3000 individuals and organisations on a database that formed the basis of all stakeholder engagement activities in the process including public participation and information workshops as well as public opinion gathering via a specially set up website – see also [http://www.capetown.gov.za/en/solidwaste/Pages/Section78\(3\).aspx](http://www.capetown.gov.za/en/solidwaste/Pages/Section78(3).aspx). Thanks to this initiative, The City of Cape Town is undertaking an assessment of the waste management services to develop an improved system, which meets legal requirements and reduces the amount of waste being disposed of to landfill.

The informal sector (IS) must be included in the participatory processes in order to ensure an interdisciplinary co-operation at several levels and among key actors so that scavengers or informal waste pickers are incorporated into the formal sector and provided with sanitary working conditions. Formalization should not be looked upon as replacing the formal with the informal, but rather as capitalizing on the informal sector and the indigenous know-how and experience to become part of an empowered formal industry and to improve the livelihoods of these stakeholders in the process rather than “policing” the informal sector and taking sweeping measures against them.

Mobilization and organization of IS workers, as waste pickers or owners of small junk shops, can be promoted by providing initial assistance and support, and creating trust and trustworthiness among waste pickers. This will lead to the establishment of IS associations able to act as social movements. These associations can engage in protests, social marches and other activities which are associated with social activities (e.g. association of Mbeubeuss landfill informal workers in Dakar described in IWWA D2.1, page 88). At the same time they are strategic actors by participating for instance in committees, working groups and forums together with the government and representatives of the private sector. In this way a process of social communication takes place and IS workers are mobilized and develop an identity of being “professionals of environment”.

## **2.5. Inadequate funding**

There is inadequate funding for waste management practices in the four target countries and this has resulted in dependence on funds from government and international donors. In most African countries government and donor agencies such as the World Bank have been the major financiers of waste management. Delays in paying waste collectors often cause disruption in collection frequency leading to the heaping of tonnes of waste that poses health and environmental risk. So serious is the issue of financing that, so many waste management firms have folded up in the past due to their inability to recover the full cost of operations or break even in almost all cases. Traditionally, one major funding window has been the imposition of collection fees on waste generators. This is working well in some areas in Ghana, Nigeria, Senegal and Ivory Coast. The Accra Metropolitan Assembly is for instance practising full cost recovery. According to the Citizens Report, most residents in Accra are willing to pay or pay more for waste management services if the service is improved. To take care of the wide variation in household income levels, the Assembly has classified residential areas into three main groups, based on average income levels

and general amenities in the area. First class residential areas pay more than low class residential. This is not only due to the fact that residents in high class residential areas are rich, but also, trucks have to serve fewer number of people and have to drive longer distance from house to house to collect the waste. Municipal waste collection and transportation equipment is obsolete in cities of the rural areas of the Ivory Coast due to the fact that majority of the population are not able to pay for waste collection and final disposal with their own budget. Solid waste budgets majorly come from national governments, but they do not have the funds necessary to invest in new infrastructure. This leaves the international financial institutions and private investors, who bring a range of conditions and prerequisites; which require international standards on which they are not allowed to compromise, and which are not affordable to the recipient. Modern day waste management is very capital intensive. Waste collectors have to maintain their trucks and collection equipment, pay and maintain their workers and meet other financial liabilities such as utilities, fuel among others. In the light of these challenges, waste contractors need to have a clean and healthy financial account.

In areas where communal collection takes place, waste generators are made to pay as they dump. The waste is usually weighed and generators pay according to the weight of their waste. These measures are good but need to be backed up by law so that offenders can be prosecuted.

Apart from the traditional means of generating funds for the waste management firms, other non traditional means include recycling and resource recovery. Waste management firms should diversify from the traditional waste collection and dumping to waste utilization. Here the waste collected can be viewed as a resource that can be turned into useful products for sale. Trash Bags in Ghana has shown that plastic waste can be turned into commercially viable products. The case of ZOOMLION converting organic waste into compost for sale or used on the company's farm to produce organic farm products for sale is also a laudable initiative.

#### 2.5.1. Discussion of best policy option(s)

According to section 4.7.4 of Deliverable 3.3, there are two types of financial instruments upon which policy options for generating income to finance IWMS can be built. These are incentives and disincentives/penalties. Some of the most powerful economic instruments include:

- Implementing the polluter pays principle
- Fees for waste collection waste type and/or waste volume based (pay as you throw)
- Economic incentives to source-separate
- Deposit-refund system for bottles and other recyclables
- Coordination with other sectors from the outset of IWMS planning

One major policy option is the Polluter Pays Principle (PPP). This policy places responsibility on the polluter to pay for generating waste. Though good, the PPP must be measured against the ability to pay by the polluter. In addition to the policy, a law backing the policy must be enacted to ensure compliance by the citizenry. Law enforcement agencies must be empowered to arrest and prosecute defaulters as a deterrent to would be defaulters. In the case of Ghana, the PPP has been an inherent policy in 1999 environmental policy where Municipal Assemblies were given the chance to charge fees from communities for collecting their waste. In the new draft National Environmental Policy, PPP has been highlighted as a major policy option of the Government. Through this policy other Assemblies who hitherto did not charge waste collection fees are now considering charging fees.

The imposition of waste treatment or environmental tax is also a laudable policy option that can be considered. Ghana for instance has placed an environmental tax on plastics produced in the country or imported. The idea is to reduce the plastic waste menace confronting the country. This is a new policy directive so it's too early to evaluate the impact of this policy. However, one major concern that has been raised is how the money collected will reach the plastic recycling company or waste management firm.

Imposition of higher tax on companies that do not sort their wastes while granting tax relief to companies that practise waste re-use/recycling is also a policy option that can be considered. There is no known application of this policy option in Africa. However, **when properly managed companies will be given enough impetus to carry out recycling since it will not negatively affect their finances.**

One major cost component is the running cost of collection vehicles. This comes about as a result of the high vehicular traffic during the day in most cities and town. Trucks spend more time in traffic increasing fuel cost. Should waste management firms be mandated to collect waste in the night when there is virtually no traffic on the road, they would be in the position to significantly reduce their cost of operation. The practice of collecting wastes in the evenings is being practiced in Accra, Ghana, and Lagos, Nigeria, but not in other parts of the country.

Additionally, the policy plan can also focus attention on acquisition of funds for development of infrastructure and purchasing of capital equipment for resource recovery and recycling and also the regular maintenance and upkeep of such equipment.

## **2.6. Deficits in personnel know-how at the technological and organizational level**

The topic of addressing deficits in personnel know-how at the technical and organizational level of waste management is very large. In this report we limit the discussion to the policy level. That includes organization and infrastructure for improving the waste management know-how in general, as well as specific know-how needed for implementation of new policies. It does not go into detail on what technical and organizational know-how is needed. The related topic of public education on waste management is covered in section 2.4.1.

As described in D2.1 (section 4, pg 124) there are many deficits in the targeted countries in personnel know-how at the technological and organizational level. Within the informal recycling sector in most cases the state of training and competences of the staff are limited and the knowledge about environmental impacts of inappropriate waste treatment procedures are insufficient. The lack of skills and knowledge in the target countries is partly a result of lack of research and development in the sector.

### **Institutional requirements for know-how in waste management**

Waste management needs institutions and technical infrastructure to reach out to professionals at all levels, including workers in the formal and informal sector for advanced training of the next generation of waste management professionals in the higher education system, and for organized learning and exchange of experiences between:

- professionals in different parts of the country
- the international waste management community and professionals in the country
- different sectors of waste management: public and private waste management, research, development and education



- policy making and the operational level of waste management

### **Know-how required in waste management**

An exhaustive list of knowledge and training needs for improving waste management in West Africa is beyond the scope of this report. However, some issues that are particularly important to address that have been identified in the IWWA work, and where know-how is lacking, are:

- improving waste recycling, which should be done by improving the existing recycling system, which is largely informal
- improved long-term planning and systems thinking, including life cycle thinking
- improved understanding of environmental and health implications of current waste practices and measures to improve the situation
- critical analysis of technologies suggested for import from foreign countries

Any policy changes need an analysis of what capacity building is required for successful policy implementation and for achieving the envisioned change in the sector. The experiences of substance restrictions in the European Union show the effects in capacity building. Substance restrictions for products within certain categories like electrical and electronic equipment induce several technical and organizational requirements. The responsible public authorities need large capacities for implementing and monitoring such substance restrictions: qualified employees who have good basic technical knowledge besides their main tasks in organizational issues.

- For monitoring the ongoing process a sampling system, sample preparation and analysis are needed.
- For standardized and reliable results certified laboratory diagnostics are necessary. The required capacities for expansion of laboratories and employee training should not be underestimated.

#### 2.6.1. Discussion of best policy option(s)

There are numerous ways to approach the issue of improving know-how in waste management. Some that may be relevant are: Professional waste management societies have been seen as important institutions for facilitating learning between stakeholders in many parts of the world (see D 3.2, examples from Sweden, section 2.2.4.3, and South Africa, section 3.2.2.2).

Relevant waste companies should also be involved in the process of policy making (similar to the stakeholder involvement in the EU). With regard to D2.1, the enterprise Zoomlion in Ghana has got a “critical mass” to get a change to improve the standards of waste management. In this case they should be involved in the political process to ensure success.

Waste management has traditionally been seen as an engineering discipline. However, addressing waste management challenges through ISWM requires knowledge from various sectors, including economics, planning and stakeholder involvement. Therefore, interdisciplinary higher education and research in waste management is highly relevant.

Specialized short training courses for professionals at all levels should be developed and provided by national authorities. These courses should aim on the special characteristics of the targeted countries. Know-how gained in international collaborations could be useful. Depending on the professional level, e-learning opportunities could be offered. For the informal sector, local training possibilities should be offered suitable for the organizational structures. Demonstration activities

are important to disseminate knowledge and information on available technologies and services for MSW management, that are adapted to the local situation in terms of waste characteristics as well as climate, culture and socio-economic situation. Investment in applied waste management research:

**Identifying and strengthening current waste management research centres initialising new research centres if needed**

- identifying research needs in cooperation with all stakeholders
- funding research
- funding dissemination of research results

The whole process from law introducing to the actual implementation of substance restrictions as well as initializing new research centres take several years even under favourable conditions as seen in Europe in case of the RoHS law. To fulfill the local situation of the targeted countries individual case solutions like green public procurement (GPP) will be more effective. GPP is a voluntary instrument, which means that individual member states and public authorities can determine the extent to which they implement it. Companies can purchase green components or products (green purchasing) according to the criteria set by eco-labels or public procurement policies for example. The management effort would be significantly lower than for the general implemented substance restrictions and results quickly visible.

**2.7. Missing waste characterization & data on collected and recovered waste**

In most African countries, lack of information and data on the composition (characterization) and on the quantity of the generated waste is a big constraint for an integrated solid waste management. This results in unsafe environment in all urban and semi-urban African cities.

From Section 2 of IWWA report it could be observed that the characterization of municipal solid waste being generated is not a main problem for the target countries, although the data could be improved particularly for the areas outside the main cities. However, the data on collected or recovered waste is non-existent or poor in the target countries. The widespread informal structure of waste collection is an obstacle regarding good quality data on collected and recovered waste. Furthermore the very common practices to dump or just burn up municipal solid waste could falsify waste data or could lead to an underestimation of the total waste flows

Information on the characteristic of e-waste and statistics on the total e-waste in the target countries is scarce. The calculation of mass flows of e-waste is difficult due to large differences between urban, semi-urban and rural regions as well as very high growth rates for all types of e-waste in West Africa. The competition between re-use and recycling of e-waste in the target countries serves as obstacle to sufficient data on the collection and recycling of e-waste or components of e-waste.

For industrial waste the data situation concerning waste characterisation and waste collection is very weak and totally insufficient to develop nationwide strategies. Many industrial waste producing companies seems to dispose their waste itself or request the service of formal or informal actors. The authorities are not really aware about the mass streams and the negative potential of the single waste flows produced in the different sectors of the industry. So for the industrial waste missing waste characterisation and missing data on collected and recovered waste is really a main barrier for an integrated solid waste management.

### 2. 7.1. Discussion of best policy option(s)

Indeed, the effective management of solid waste can be part of a sustainable vision only if information and data on the composition (characterization) and on the quantity of the generated waste are well known. Knowledge of the quantity and composition of the waste allow to optimize the management approach and to promote, possibly, the creation of material recovery processes. This not only contributes **to create a safe environment** around cities (streets, suburbs, etc.), but also can play a significant role in the fight against poverty especially in developing countries through the recovery of various materials and their sale by scavengers.

The purpose of waste characterization is to provide vital information on which the decision maker is able to choose its management policy for different waste streams. This information should enable it in particular to implement effective programs for management (recovery, recovery, etc.), and to optimize the choice of waste treatment technologies. Since the characteristics of waste generated are constantly changing, monitoring over time is essential for any **effective management and sustainability**. Thus, any characterization **option should take into account the aspect of regular updating of data**, and therefore, it must be reliable, locally relevant and It should have a minimal cost which may be supported by the interested communities.

To date, several methods of characterization of waste have been implemented in different countries. Most of them are made in the developed countries and are intended to be applied in different socio-economic and cultural similarly. They are based mostly on the characterization of waste from the dump or landfill or final sampling in bins or bags placed on the highway by each generator. Quantifying waste collected and recycled by the informal sector requires different methods and has received much less attention. Recent work to quantify these waste streams is described in UN-habitat, 2010.

The main disadvantage of some of these methods is the difficulty of distinguishing categories, when the sample is taken from a dump or landfill, and difficult to allocate the quantities of sorted population size.

## **2.8. Lack of reliable waste collection service and waste segregation (role of the informal sector)**

### **Collection and transport**

#### Municipal waste

In West Africa as elsewhere, the collection and transportation of municipal waste involves several elements that are related: the choice of private companies, hours of collection, collection vehicles, collection equipment, the condition of roads, access areas to be covered. The weakness or lack of one of these can be an obstacle to the functioning efficient of collection and transportation.

In the target countries, the lack of transparent selection procedures for private companies can be a barrier to successful implementation of services for the collection and transportation of municipal waste. This non-compliance with the rules on public procurement often leads to the choice of private companies without the appropriate logistics (old vehicles, material collection deficiency, etc.) to ensure an efficient collection service and transportation of municipal waste. The non-specification of the type of waste (municipal, services, industrial, medical) to collect at the signing of contracts between local authorities and private companies often leads to logistical problems such as: non appropriate of material collection, difficulties of transporting waste or transportation of waste other than municipal. The bad roads in some target countries are a major problem in

collection and transportation of municipal waste. It causes a rapid degradation of the truck of private companies and makes it almost impossible for a total coverage of the cities in collecting and transporting waste municipal. Furthermore, there is also the problem of accessibility of waste collection vehicles in the informal settlements of large cities (Lagos, Abidjan, Accra and Dakar) of the target countries.

These obstacles mentioned above in the formal sector have resulted in most of the targeted countries in the emergence of an informal sector of collection. The informal sector or primary collection has access to areas inaccessible to motorized collection and to waste collection points (transfer stations, containers) and can be picked up by mechanical equipment. In addition, in areas easily accessible, formal collection is irregular, informal collection is in addition to motorized vehicles in these areas. However, informal actors do not always respect the regulations and laws. Often, they abandon wastes on roadside, vacant lots, ditches, lagoons, etc., giving rise to open dumps around. However, the informal sector provides considerable support to formal services for the collection and transportation, and it is not conventionally integrated into the policies of municipal waste management in the targeted countries. In general, the informal sector has no agreement with the local authorities (Town Councils, District, etc.) or institutions. The lack of regulatory and legal framework of the informal sector created many problems between the actors of this sector (informal) and private companies (formal actors). These problems often cause a major malfunction of the system of waste collection.

#### Electronic waste (E-waste)

In the four targeted countries (Côte d'Ivoire, Ghana, Nigeria, Senegal), the formal service for collection and transportation of specific E-waste does not exist. This is partly due to the fact that the e-waste is considered at the same level like municipal waste by the local authorities and populations. This results in a complete lack of legal and legislative framework for the management of e-waste in the targeted countries. The ignorance of the local authorities of the need for collection services specific for e-waste is a barrier to implement the ISWM in the targeted countries.

In these countries, the collection and transportation of electronic waste are totally dominated by the informal sector. The fact that informal activities to collect and transport are dominant in the target countries is a crucial point which explains the main obstacles and barriers to integrated management of solid waste. The development in the target countries of informal markets of electronic components with very high economic value and precious materials such as copper or lead is also a barrier to implement ISWM.

#### Industrial waste

Overall there is also a tremendous lack of reliable waste collection service and transportation concerning industrial waste. In some target countries, for some highly toxic industrial waste, industries often sign contracts with private companies (toxic waste in Côte d'Ivoire, 2006). Generally, these private companies did not have the material to collect and transport. This poor situation is impaired by the lack of good governance in the target countries in order to implement and enforce ISWM and large gaps in waste statistics on industrial waste.

#### **Reuse/Recycling**

In the target countries, although most of the recycling activities are performed by the informal sector this is normally not accounted for in planning, policy formation or implementation of formal waste management. Furthermore the legal backing for waste-pickers is missing, i.e. guaranteeing

their customary rights to access, sort and recycle waste and their legitimacy to compete in the waste recycling business.

Going through the report of WP2 for all the four target countries, many people outside the official municipal workforce are involved in reuse and recycling. This includes:

1. Informal sector waste pickers who pick up discarded materials from streets and dump sites.
2. Itinerant waste buyers who collect and buy 'unwanted' items door to door from households.
3. Dealers, who buy, sort and sell materials.
4. Wholesalers, usually specialised in one material, who aggregate materials and compress them for more efficient shipment and who sell them to industries.
5. Recycling enterprises that process recyclables into intermediate industrial feed stocks.
6. End-user industries, which purchase processed recyclables as feed stocks to make their final products

#### Municipal solid waste

There are informal waste buyers who go from house to house, waste pickers at collection points and disposal sites as well as the formal market for recycled materials. The market is most developed for metals and e-waste, plastics, paper and organic waste. The activities of the informal sector in this regard are normally not accounted for in planning, policy formulation or implementation of formal waste management. Furthermore, the legal backing for waste-pickers is missing, i.e., guaranteeing their customary rights to access sort and recycle waste and their legitimacy to compete in the waste recycling business. There is no agreement between the informal sector and the local authorities in some of the target countries where the informal sector exist and in recent time their activities conflict with those of the formal private sectors as observed in Ghana. In countries like Nigeria, there is no regulation of the activities of the formal sector by government agencies, thus, the integration of the informal sector into solid waste management systems is lacking in this country as well as in Côte d'Ivoire and Senegal.

#### Electronic waste

In all the target countries, there is no formal e-waste collection and recycling sector in place, all the activities are performed by the informal sector. Informal collection is not sufficient and recycling is done mainly by the informal sector. Definite legislation, implementation and enforcement mechanisms regarding informal recycling of E-waste are lacking. The informal practices are mostly characterized by an unsuitable management and treatment of hazardous components unsustainable working conditions including child labour. Unorganised informal collection and recycling sector is a main barrier for integrated solid waste management in the target countries.

#### Industrial waste

In the targeted countries, a large scale of informal collection and recycling activities could be detected which means very often a common disposal of municipal waste and industrial waste on landfills. Specific legislation and laws for industrial waste management do not exist within the target countries. However, industrial waste is generally governed by environmental impact assessment legislation.

## Final Disposal/Landfilling

There is a considerable lack of reliable waste collection service and waste segregation concerning all the type of waste included in the scope of the project. The landfill approach may imply the effective introduction of both actions in order to improve the actual situation in target West African countries regarding the high rate of land filling or dump sitting identified.

Most of the municipal solid waste is disposed off in official dumpsites where the common practice is the compaction of waste by trucks. Wastes which are irregularly or illegally dumped by the informal sector are often burnt in order to reduce the volumes. As well, main products from landfill sites include recycled products through activities of informal waste pickers which collect valuable fractions from dumped wastes. Unwanted parts of E-waste are often disposed in landfill or uncontrollably incinerated in order to recover valuable materials as metals (Cu, Al etc).

Regarding Ivory Coast, the dumping site in the district of Abidjan is not a controlled landfill without previous treatment of wastes and which is actually saturated. Municipal and industrial wastes are mainly collected and transported to landfill by private companies. Sanitary risks are high due to the uncontrolled formation of gas emissions. However, there is a technical landfill in project to replace the not controlled old landfill from Abidjan. None of the secondary cities of Ivory Coast has a controlled landfill. Rural zones are also lack of waste management systems where municipal wastes (industrial wastes are not generated) are open dumped in nature.

The situation in Ghana regarding final disposal by landfill, is similar as there is the need to develop a well designed landfill sites and surrounding infrastructures as roads and tracks, for waste controlled disposal. Ghana has projects to start building well designed and engineered landfills in the high population zones. There are only two engineered landfills, no one located close to the capital Accra, and the remaining disposal sites are improved dump sites. Informal actors who mainly collect waste from house to house and from streets, sent the waste to a Central communal container managed by a private company as they cannot move straight to the landfill. However, informal sector is also involved in an irregular and not organized waste scavenging from landfills.

A regulatory body (EPA) is the responsible for Waste Management in Ghana. Theoretically, the mentioned body has to give approval if an existing excavation is to be used as landfill so as detailed management plan has to be submitted to EPA detailing the operative and closure plans. However, the real practice shows that these requirements are hardly done.

Actually, the management of the waste disposal dump-sites is carried by private companies with no controlled plans as they are located close to houses or constructed in land fill sites not designed for waste disposal, violating the existing sanitary laws and without taking Environmental Impact Assessment into consideration.

The city of Lagos in Nigeria is a good example of the efforts they are carrying out for solid waste management with the help of waste management authorities. However, there is lack of well designed landfills in other big cities where common practices are open and river dumping. Informal sector role in landfill regards in the material recovery from dumped wastes in order to sell them to recycling sector after a cleaning and/or upgrading process. The lack of coordination between informal sector and authorities lies in a non implementation of a correct SWM policy.

Senegal is not an exception regarding the inadequate management of landfills where the wastes, after weighted, are open dumped and compacted. There are a lot of unofficial dumping sites where uncontrolled incineration is frequent.

Landfills are highly agglomerated by population causing considerable sanitary and land planning problems. Another problem is the unsatisfactory situation of the road infrastructures from centers of population to landfills which leads to the formation of the already commented unofficial and small dumping sites by the informal pickers. However, some improving efforts are shown due to new good engineered facilities are being built as a sanitary landfill close from Dakar and various waste transfer and separation stations.

The main conclusions regarding final disposal and landfill are focused in the lack of solid waste management planning including the availability of land for landfill sites around big population centers, not definition of ad hoc project based development and the nonexistent of agreement and coordination between the informal sector, private sector and local authorities.

### 2.8.1. Discussion of best policy option(s)

#### **Collection and transport**

In the collection and transportation of municipal solid waste, the policies of the target countries are laudable, but can be improved in some aspects such as how to select private companies, the formalization of informal sector activities and their management account in the implementation of the GDS, improving the condition of road infrastructure, etc.

For the selection of companies private providers, local authorities responsible for waste management must carry out tenders in full transparency. This will prevent the selection of fictitious companies which do not have the necessary commitment and capacity to carry out the service of collection and transportation of municipal waste. The activities of collecting and transporting waste will be contracted to companies with professional material resources in good condition, adapted to local infrastructure and causing less disturbance to the operation. The contracts between private companies and local authorities should be as specific as possible. They must indicate in particular the collection area, working hours, the number of districts to be served and the type of waste collection and transport.

For the collection of items, grouping, sorting of recyclable waste should be encouraged. There may be, for example, containers for different types of textile waste glass, paper and adapted gears will collect and transport the waste to the units of treatment and valorization.

Target countries must professionalise their informal system of collection and transportation of waste. This requires the equipment and capacity building of informal providers like pre collectors. The professionalization of pre-collector (sector informal), begins with their identification and their grouping in associations or Small and Medium Enterprises (PME in French). This will allow local authorities and government to have partners with whom they can discuss. The model contracts will be signed between the associations of precollectors and the authorities on the basis of specifications of standards on the one hand, to create permanent employment, to encourage entrepreneurship and secondly to empower youth and women, and more effective control over the activities of the sector. However, the associations of pre-collector should be subject to accountability for results.

To avoid disputes between small pre-collection and private companies, the authorities of target countries should organize their actions in their various areas of intervention. For participatory management of all stakeholders in the collection and transportation of solid waste, partnerships, small pre-collection and private companies should be encouraged through outsourcing contracts for the collection.

In the collection and transportation of solid waste and industrial electronics, there is no reliable policy for collection and transportation in the four target countries. In terms of industrial waste, the authorities should strengthen or enforce laws regarding the collection and transportation of industrial waste. From this perspective, it would raise awareness of economic operators in the industry. In the targeted countries, there is a need for training and equipment to private companies that operate without appropriate logistics (trucks, collecting equipment, etc...) collection and transportation of industrial wastes sometimes highly toxic. The collection and transportation of electronic waste being almost informal in the target countries, it is necessary for better waste management to professionalize the sector. This requires the training of informal sector and their equipment in proper equipment. The authorities are encouraged to set up a regulatory framework for collection and transportation of electronic waste.

### **Reuse/Recycling**

Solid waste management laws should have a policy to pursue a coordinated statewide waste reduction, reuse and recycling, and management program implemented through an integrated approach generally referred to as the waste management hierarchy

The waste management hierarchy of “Reduce, Reuse, Recycle, Recovery, and Disposal” ultimately aims at waste minimization. Waste policy should have as its first priority, the reduction of waste generated. This is known as reduction from source. The second priority should emphasize the need for reuse and finally recycling. Consequently, wastes that cannot be reduced, reused or recycled should then be sent to the landfill or to an incinerator.

Solid waste management policies should include as the very minimum laws and regulations that ensure the following:

- Mandatory and easily accessible collection points for recyclable and reusable wastes, strategically located (drop-off centers, buy-back centers, curbside collection).
- Adequate volume of recyclable/ reusable waste generation to ensure steady supply of raw materials for viable operations of the recycling facilities.
- Ready market and sustained demand for recycled products or products made from recycled materials, i.e to make it economically viable.
- Mandatory recycling (and composting) and reuse of materials in the waste stream. Manufacturers to include recycling in their operations and use of recycled materials in their products.
- Source-separated or co-mingled collection programs, manual or mechanical separation to provide recycling for metals, glass, paper, plastics, organic waste and the removal of common hazardous wastes, e.g., batteries, paints, and solvents.
- Procurement laws that encourage the use of recyclable materials. In addition to these procurement incentives, there needs to be a re-examination of laws that provide incentives for the utilization of raw, natural materials that may provide a cost savings incentive to manufacturers.
- Government’s procurement regulations should include recycled products.
- Comprehensive education programs on waste minimization, reuse, recycling and resource recovery. Such education programs would involve the media, schools, industry, government, and academia.



- Broad public involvement as well as participation by state, regional, and local authorities when siting solid waste management and recycling facilities, and planning for solid waste management
- Encourage the expansion and stabilization of the economic base for recycling in the local, regional, state, and national economy, including the support for existing and new laws designed to encourage the manufacture and purchase of products made from recycled materials.
- Encourage the evaluation and use of public/private partnerships where appropriate to manage solid waste in the areas of reduce, reuse and recycle.
- The informal sector has to be recognized, trained, equipped and empowered for the strong role they play in this sector in the areas of collection, separation, recycling and reuse of waste. This would result in cost efficiency and effectiveness.
- Recognition of stakeholders in reuse and recycling of waste. These are people outside of the official municipal workforce such as dealers, Itinerant waste buyers, waste dealers, recycling enterprises e.t.c.
- Policy to support appropriate reuse (parks, open space) of closed landfills after methane gas has been recovered and leachate has been contained or after methane production has subsided, and where public health is not jeopardized by exposure to hazardous materials. (Policy guide, 2002)
- Promote economic instruments to further strengthen/ encourage reduce, reuse, recycle behaviors and choices. This could be in the form of sales tax or value added tax on goods that are made by recycling used materials, such as paper, plastics, glass, metals, or reduce sales tax or value added tax on second-hand goods, which may include books, clothes, house-hold gadgets, bicycles, cars and automobiles, office equipment, and so forth. An additional approach may be to reduce the interest rates on the financial loans, which companies avail of, for their commercial activities in the recycling, re-use and resale of used material and equipment.
- Encourage of voluntary compliance. This could be through provision of incentives for return of recyclable/ reusable wastes including e-waste.
- Adequate recycling facilities/ services to cope with volume of recyclable waste generated.
- Compulsory product labeling to include quantity of recycled materials in the product, how and where product can be disposed of or recycled.
- Industrial waste falls under the responsibility of the respective producers; manufacturers should be responsible for their products along the product life cycle.
- Polluter pays principle as regards to Waste Electrical and Electronic Equipment (WEEE). Making waste producers, including households, pay for collection and treatment of their waste,
- Electrical and electronic equipment imported into African countries must meet certain specifications e.g. E.U RoHS directive on, restricting the use of six hazardous materials in electrical and electronics equipment.

- Incorporate Extended Producer Responsibility (EPR), regulations locally on the obligations for return, take-back and disposal by consumers, producers and municipalities of Waste. The Extended Producer Responsibility on electrical and electronics equipment makes a producer of electrical and electronic equipment responsible for the collection and appropriate disposal of e-waste.
- Have a goal of quantity of waste generated that should be recycled within a period.
- E-waste has to be collected separately from other (mixed) municipal solid waste to promote reuse and recycling.
- Setting up of e-waste dismantling centers, incorporate performance target and recycling standards and mandate practice of Environmentally Sound Management (ESM) of e-waste.

### **Final Disposal/Landfilling**

The focus of solid waste management has to be changed in the target West African countries from provision of waste disposal facilities to systems and facilities that recover resources and reduce the amount of waste generated.

Pursuing waste avoidance and recycling rather than filling up the landfills is an important way of contributing to more sustainable countries. Therefore there must be a growing community expectation to reduce the reliance on landfills for the disposal of waste. Inevitably some wastes cannot currently be viably removed from the waste stream. However, new solid waste management policies in target West African countries have to support that use of landfills has to be a last resort and needs to be carried out in a way that protects the environment and the community.

A set of guidelines for a Solid Waste Management Policy development in terms of final disposal/landfilling, are next indicated:

- In the informal and private sector, encourage the minimisation of the development and use of landfills and diversion of waste materials for reuse or recycling instead of disposal.
- Promote improvement in the way the West African countries site, design and manage landfills, implementing well defined coordination between informal sector and authorities, to ensure that municipal and industrial wastes are managed in a way that protects the environment and human health.
- Encourage the incorporation of current landfill best practices evaluated from European and other more developed African countries.
- A large number of non passable roads and streets from cities to landfills have given way to a larger number of not licensed and uncontrolled small waste dumps. This trend is likely to continue. Therefore, there has to be a parallel trend towards establishing 'transfer stations' that provide the convenience of small local landfills without acting as permanent disposal facilities for waste. Transfer stations allow materials to be sorted for reuse and recycling before the remaining material is disposed of in a licensed and well engineered landfill.
- The landfill levy is an integral component of waste management systems analysed in other developed countries and has to be introduced in the target West African countries. Landfill levies play an important role in providing funding assistance to establish waste management infrastructure, support programs for industry, education programs and the resourcing of the bodies responsible for waste planning and management. The levies also

would act as an incentive to minimise the generation of waste, increase reuse and recycling and promote investment in developing alternatives to disposal to landfill.

## **2.9. Land availability for landfills and transport problems to landfills**

Landfilling is a major issue in the four target countries in the sense that land is not readily available for such a purpose. This development had arisen due to uncontrolled factors such as rapid urban growth, poor environmental sanitation, poor spatial planning, lack of priority for waste management, among many more. Since recycling and recovery of waste materials has not been the focus of formal waste management in the West African countries, landfilling is the currently the main option for getting rid of the generated waste. Thus all means possible are applied in acquiring site for the disposal of the waste without consideration for predetermined factors necessary for siting landfill. Although there appear to be institutions, policies or the laws regulating the siting of a landfill, but the prevailing circumstances in the four countries paralyze their implementation. In Ghana for instance, there are guidelines for siting landfill which has environmental and economic considerations. However inability of the appropriate institutions to apply the right measures in addressing the issues had triggered chain of problems in landfilling. In many instances, demand for site for waste disposal had superimposed on ensuring that the acting institutions do well to monitor and address the anticipated problems, before siting landfill

Many landfill sites in the target counties are old quarry pits which are not properly lined to prevent seepage and flow of leachate. They were discovered because of the growing scarcity in land availability for dumping of waste. Leachate management within such environment has become imperative and extra money had to be spent in this venture; many of which the responsible service providers or government neglect and had becomes a burden to the affected communities. Hazardous wastes are as well dumped in such available dumpsites since there are not proper instigated measures to check on the right disposal options. Learning from these experiences over the years and increasing awareness of various members in the communities, the people have resisted siting of landfill near to their settlements, even over projects which are marked to improve on and follow the laid down processes of siting landfill as per the landfill management guidelines. The overwhelming difficulty faced by city authorities over site for waste dumping could also be attributed to encroachment of land marked for landfill purpose because of urbanization. In Ghana most of the land is owned by the traditional authorities; parcels of which were acquired by the government. Increasing demand over land has lead these traditional authorities to sell out great portions of the land to individual or corporate bodies, making it difficult for the central government to have access. City planners on the other hand, are not able to exercise their right to ensure that area sited for landfilling are surely considered for that purpose, although in most cases there are such demarcations in the spatial plan.

In many of the cities, the existing old dumpsites are almost to their capacity and no land is marked for construction of landfill; thus the cycle of dumping in another identified site, which might not be ideal as in comparison with the principles of siting landfill site spelt out in the landfill siting guideline book, would continue if no intervention is made.

Most of the existing dumpsites have poor accessible roads which are not tarred, become slippery and pot-holed during raining seasons, making transportation of the waste a difficult task. Frequent breakdown of the servicing trucks are recorded making service delivery very poor due to unavailability of the trucks. This had led to development of pockets of uncontrolled smaller dumpsites at unapproved locations by individuals as well as trucks which are not able to make it to the official dumpsites. In addition some of the landfill sites are far from the city centre making

transportation cost very high. This also contributes to non-lifting of waste because of depleted operational budget of most of the waste collection companies since their revenue in many cases are not paid prompt. In addition, there are no special trucks which are assigned to carry hazardous or special waste; same truck which carries household waste does it for all forms of waste. The limit over distance to which certain waste stream must travel are not observed and monitored by the appropriate authority.

It has therefore become economically prudent to consider recycling or recovery options of waste management. In short all possible management strategy which is applicable to the situation in the sub-region must be given attention, in anticipation to have environmental, economic gains and increase the lifespan of the existing landfill. Site selected for landfill must have other waste management related projects to maximize the value of the land.

Ghana's Landfill Policy as in the EPA Landfill Guideline of 2003, Guidelines is one that seeks to gain maximum impact from limited resources. A key element of landfill policy is a major emphasis on site selection. Careful selection of landfill sites can greatly reduce the potential for negative environmental impacts and may even in the long run generate community assets when the sites are rehabilitated. Thus, good spatial planning must be practised to achieve an effective long-term waste management objective, and to avoid sub-optimal solutions resulting from last-minute "panic measures" because the identification, acquisition and development of suitable sites usually takes several years.

Key Stakeholders indentified with Landfill Land availability includes:

District Assemblies (local government institution and represent the political authority for a city or town)

Chiefs (Traditional Leader who own most of Ghana's Land mass in trust for their people)

Private Land owner or Waste Management Companies

Environmental Protection Agency (EPA- regulates environmental standards, and administers permitting and certification procedures for landfills)

The Regional Co-ordinating Council (RCC), in case where the landfill is serving more than one district with a region, they play a key role in ensuring adequate collaborative arrangements for the siting, management and monitoring of landfills .

Three main instruments are involved (or will eventually be when given legal status) in the regulation of landfills:

- Environmental Assessment Regulations, 1999 (L.I. 1652);
- Landfill Operating Licences issued by the District Assemblies;
- The Landfill Guidelines Policy

L.I. 1652 states that all landfills require an Environmental Impact Assessment prior to construction. Once this is approved by the EPA, the EPA will issue an Environmental Permit allowing for landfill to start at the proposed site within 18 months, subject to stated conditions. Development of a landfill can only start after the Environmental Permit is issued. As site selection and acquisition is a function of the District Assembly, it is the Assembly that would apply for the Environmental Permit.

### 2.9.1. Discussion of best policy option(s)

As mentioned, many landfills are poorly sited, often uncontrolled, poorly operated and not engineered as sanitary landfills and at times unlicensed and hence operated illegally. Poor town planning (e.g. by placing residential developments at a landfill site's doorstep as witnessed in Senegal, Dakar and non-utilisation of zoning schemes) have further resulted in some landfills being put into the wrong areas or alternatively allowing other incompatible land use activities to come too close to it. The construction of new landfill sites, or the expansion of existing sites, is often opposed by nearby residents. Next to geological considerations of suitable soil and low water tables this generally limits the utilisation of available areas for landfill purposes (assuming the area would be suitable as a landfill location in the first place). Future landfills will therefore have to be chosen more appropriately, with measures that ensure that residential or business areas do not come too close to them so as to extend the lifespan as far as possible. This will also avoid complaints from residents. A proper environmental impact assessment must be done to identify suitable areas, particularly where the proposed landfill site will also receive hazardous waste. At the same time town planning should be improved and zoning schemes should be drawn up and/or applied. Buffer zones should also be kept around landfills, and any encroachment by housing developments, business parks or industry should be prevented. The most effective way to do this is to establish a compatible activity within the buffer (e.g. plant trees for wood production; food gardening and medicinal plant nursery are not advisable especially where soil and water are contaminated) or a waste beneficiation activity.

Transport of waste has been identified as a further problem both with regard to logistics as well as financial considerations. Because houses are often built too close together, or in difficult to reach areas, traditional waste collection trucks are not always suitable or financially feasible. Many areas might also not have paved roads; alternatively the roads might be in such a poor state that access is difficult for trucks. Different vehicles should therefore be used for different areas. At the same time the number of trips a vehicle does should be kept in mind and compared to the financial and environmental impact of each trip. In other words, an analysis should be done to determine which vehicles are the best suited for the different areas having regard to access, mobility, practicality and costs. Besides the use of waste trucks or other smaller trucks the collection by animal-drawn or handcart carriers or other motorised vehicles, very usual for waste collection in the targeted countries, should be continued as they would be an essential part of the logistical structure of the SWM systems to be implemented.

Whichever form of transport is used during collection, it should, be suitable in the first place, and must be designed for the type of waste it transports. Thus vehicles should be covered to prevent waste from falling or blowing off and have suitably high sidewalls to contain the uncompacted waste. In addition, where liquid waste is transported the vehicles should be leak or spill proof. Hazardous waste collection vehicles must be lockable and suitably labelled to inform about the type of load and any associated dangers.

Drivers and collectors should be trained or, at the very least, be made aware of how to collect, load and transport waste correctly, and furthermore what measures to take in the event of a load loss, spill or emergency.

This would apply irrespective of whether the waste is transported by the authorities or a private contractor.

Ideally private waste contractors should be licensed or officially identified by a registration process. This would enable more efficient control by authorities, and would help to reduce waste transport

problems as well as identify private “fly by night” type operators that are often responsible for illegal dumping. Naturally the authorities would need to implement greater supervision as well.

Public-private partnerships should be explored particularly for waste collection, but also for landfill sites.

### **3. SYNTHESIS ON BEST POLICY OPTIONS**

This report within the IWWA project covers the description and evaluation of policy measures regarding the elaboration of guidelines for the future implementation of strategies. The content refers on the previous work packages 2 and 3 and will be used as input for the following deliverables D 4.2. “Guidelines for implementation of policy strategies in ISWM” and finally D 4.3 “Policy briefs for the development of National and Regional Action plans in Côte d’Ivoire, Ghana, Nigeria and Senegal”. The best policy options evaluated are the realization of coherent ISWM legal frameworks in the target countries and their enforcement by a coherent organizational structure, by an innovative relation between local authorities and the policy environment, by an implementation through public participation, by adequate funding concepts, by the improvement of personnel know-how at the technological and organizational level, by suitable waste characterization & data on collected and recovered waste, by the implementation of the existing informal sectors for future reliable waste collection service and waste segregation and by innovative strategies for the securing of the land availability for landfills and the addressing of transport problems to landfills.

### **4. SUMMARY**

The deliverable mainly focused on policy gap analysis and recommendation of best policy measures to actualise integrated solid waste management in the four target countries. The results of the analyses show that there is a lack of a central piece of legislation laying down the principles of waste management for all categories of waste streams. In addition to this there is a lack of coordination among the institutions and authorities responsible for policy making and enforcement of the laws/regulations leading to coordination problems, overlapping in terms of responsibilities and dilution of accountability. There is a weak relationship between local authorities and the policy environment with no clear provision for public participation in the policy making processes. In the four target countries, government and donor agencies such as the World Bank have been the major financiers of waste management and the finance obtained from these sources is inadequate to cover the total cost of Solid Waste Management. There are deficits in personnel know-how at the technological and organizational level in terms of skill and knowledge acquisition. These deficits are linked with lack of research and development in the integrated solid waste management sector. The existing Solid Waste Management policies do not include an effective segregation stage, waste collection and transportation service, waste characterization and data on collected and recovered waste and informal sector. The non availability of a proper landfill is a serious issue and the existing dump site causes numerous health and social problems. The existing Solid Waste Management policies do not include an effective segregation stage most of the recyclable solid waste is disposed off at the landfill site.

Implementation of ISWM in the four counties will require policy options that will reflect a central piece of legislation laying down the principles of waste management for all categories of waste streams, coordinated enforcement and institutional structures, financing frameworks, opportunity for private participation, institution of polluters pay principle and extended producer responsibility principle, community awareness and education and convert open dumpsites into engineered sanitary type landfills and reduce waste sent to landfill site with final objective of zero waste.