

COUNTRY REPORT ON  
THE SOLID WASTE MANAGEMENT

# ALGERIA



July 2010



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## COUNTRY PROFILE ON THE SOLID WASTE MANAGEMENT SITUATION IN

# ALGERIA

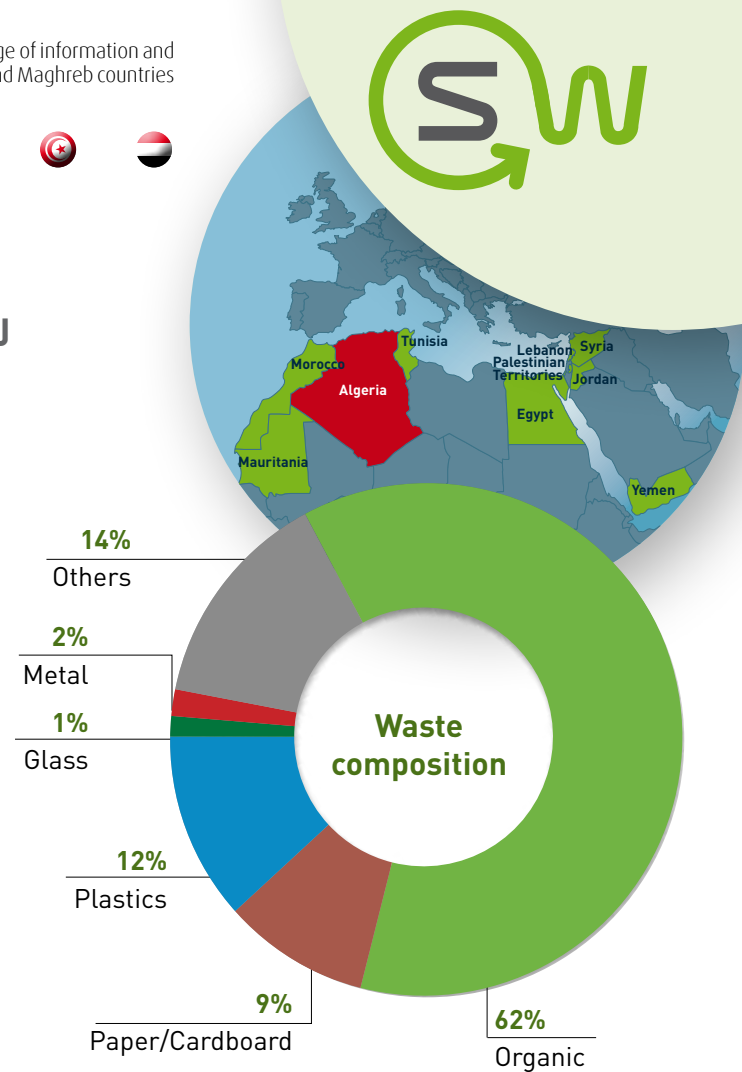
July 2010

### BACKGROUND INFORMATION

|   |                         |
|---|-------------------------|
| • Population :                            | 35 million              |
| • Municipal solid waste (MSW) generation: | 8.5 million tons (2009) |
| • Per capita MSW generation:              |                         |
| urban areas                               | 0.7 kg/day              |
| rural areas                               | 0.5 kg/day              |
| • MSW generation annual growth:           | ~ 3 %                   |
| • Medical waste generation:               | ~ 37,000 T/year         |
| • Industrial waste generation:            | ~ 2.5 MT/year           |
| • Hazardous industrial waste generation:  | ~ 325.1 KT/year         |
| • Agricultural waste generation:          | -                       |

### TECHNICAL PERFORMANCE

|  |                              |
|--|------------------------------|
| • <b>Municipal waste</b>   |                              |
| - MSW collection coverage :  |                              |
| in rural areas   | ~ 60%                        |
| in urban areas   | ~ 85%                        |
| - MSW final destination:   |                              |
| - Composted:   | 0%,                          |
| - Recycled:  | 4-5%                         |
| - Landfilled :   | 15%                          |
| - Open-dumped:   | ~ 80%                        |
| - Number of sanitary landfills   |                              |
| - Under study:   | 27                           |
| - Under construction:  | 42                           |
| - Built:   | 32                           |
| - Operational:   | ~ 10                         |
| • <b>Hazardous and industrial waste</b>  |                              |
| - Number of treatment units/centers of industrial wastes (physical chemical treatment) |                              |
| - Under construction:  | 2                            |
| - Built:   | 0                            |
| - Operational:   | 0                            |
| - Types of treatment of medical waste:   | Incineration and landfilling |



### LEGAL FRAMEWORK

#### General legal solid waste management (SWM) framework

- Law No. 01-19 relating to the management, control and disposal of waste.
- Law No. 03-10 relating to the protection of the environment in the context of sustainable development.
- Executive Decree No. 02-175 on the creation of the National Waste Agency (AND).
- Executive Decree No. 04-410 establishing the general rules for the development and operation of waste treatment facilities and the admission of such waste at these facilities.
- Executive Decree No. 07-205 establishing the modalities and procedures for the preparation, publication and revision of the scheme of municipal household and similar waste management.

#### Specific legal framework for the management of packaging waste

- Executive Decree No. 02-372 relating to packaging waste.
- Executive Decree 04-199 fixing the modalities for the establishment, organization, operation and financing of the public system of treatment and recovery of packaging waste «ECO-JEM».



## INSTITUTIONAL FRAMEWORK

**Policy and planning** : The Ministry of Land planning and the Environment (MATE) responsible of the implementation of the Municipal Solid Waste Management National Program (PROGDEM).

**Implementation and operation** : National Waste Agency (AND) whose mission is to support the local communities in SWM and to promote activities linked to integrated waste management.

### Practice of waste management

- **Municipalities**: full responsibility for the management and control of municipal solid waste
- **The Ministry of the Interior and Local Communities (MICL)**: financial and logistical support to municipalities

**Control & regulatory implementation** : The directorate of environment at each Wilaya (governorate).

**Staff training**: National Conservatory for Environmental Training (CNFE).

## POLICY AND PLANNING

- Municipal Solid Waste Management National Program (PROGDEM): launched in 2002, has already made possible the development of many SWM projects (municipalities master schemes, landfills, sorting centers, etc.).
- Industrial and Special Waste Management National Program (PNAGDES): aiming at the control and disposal of special industrial waste and potentially infectious health-care waste.

## FINANCIAL AND COST RECOVERY ARRANGEMENTS

### SWM Financing

- SWM infrastructure is financed primarily by the State (the investments mobilized for the period 2001-2010 are nearly 50 billion AD\*).

- SWM operating expenses are partially covered by the garbage removal tax set annually between 400 and 1000 AD per household.
- Cost recovery: the Common Fund of Local Communities (FCCL).

### SWM Costs

- Average cost of treatment and disposal: 1500 and 2000 AD / ton (excluding depreciation).

## PRIVATE SECTOR INVOLVEMENT

- Quasi-absence of private operators in SWM sector
- Participation limited to anarchical recovery of recyclable waste at landfills.

## OPTIONS FOR IMPROVEMENT

- Optimization of existing SWM services ;
- Enhancement of the cost recovery rate ;
- Strengthening national and local capacities in project management as well as enhancing technical skills in recycling and landfills management ;
- Encouraging the private sector to participate actively in this sector ;
- Raising citizens' awareness to reduce waste ;
- Setting a precise definition of the responsibilities regarding medical waste management and investing in the treatment of this type of waste.

supported by

\*1 € = ~ 80 AD

## 1. EXECUTIVE SUMMARY

Algeria is a vast country covering an area of more than 2,380,000 km<sup>2</sup>. Its population currently stands at 35 million people spread unevenly across the country. The highest concentration is in the Northern Region which represents only 4% of the total area (less than 100,000 km<sup>2</sup>) and is home to over 65% of the total population, a density close to 300 inhabitants per km<sup>2</sup>. This spatial distribution of the population and the high urbanization rate (~65%) has generated great pressure on the environment, particularly in the management of municipal solid waste.

On the ground, this has resulted in the appearance of thousands of uncontrolled landfills and dumps and created difficulties for local communities to take responsibility and ensure the cleanliness of towns.

Since 2002, significant funds raised have helped to initiate: - studies of many master schemes for the management of household and similar waste of the wilayas (governorates) and municipalities, - the construction of engineered landfills (CETs), - the establishment of waste reception centers, - the construction of sorting centers, - the acquisition of means to exploit this infrastructure and means to collect and transport waste. Investments mobilized during the period 2001-2006 neared 25 billion Dinars, while the Five-Year Plan to Support Economic Growth 2005-2009, has allotted 36 billion Dinars (386 million Euro) to the environmental sector, including over 50% allocated to household and special waste. Many projects are being launched or implemented.

This sector should be funded in the next program (2010 - 2014) with at least an equivalent budget, which allows for presaging some interesting opportunities for developing partnerships particularly in engineering, technical assistance, equipment supply as well as CDM (Clean Development Mechanism) projects.

## 2. INTRODUCTION

**Table 1: Key data**

|                                     |  |                           |
|-------------------------------------|--|---------------------------|
| Population                          | 35 million (2009)                                      |                           |
|                                     | Growth/year  | 1.43%                     |
|                                     | Urban  | 61%                       |
|                                     | Rural  | 39%                       |
|                                     | Density in the North                                   | 300 inhab/km <sup>2</sup> |
|                                     | Density (national)                                     | 13 inhab/km <sup>2</sup>  |
| Generation of MSW                   | 8.5 million tons of household and similar waste (2009) |                           |
| Composition of MSW (%) <sup>1</sup> | Organic  | 60 - 65 %                 |
|                                     | Paper  | 9 - 10 %                  |
|                                     | Plastic  | 11 - 13 %                 |
|                                     | Textiles   | 10 - 12 %                 |
|                                     | Glass  | 1 - 1,5 %                 |
|                                     | Metal  | 1 - 2 %                   |
|                                     | Other  | 2 - 4 %                   |
| Composition of MSW by producer (%)  | Household and commercial                               | 85%                       |
|                                     | Industrial (non hazardous)                             | 15 %                      |
| Per capita MSW generation (kg/p/d)  | Rural  | 0.5                       |
|                                     | Urban  | ~ 0.7                     |
|                                     | Capital (Algiers)                                      | ~ 0.9                     |
| Collection coverage of MSW          | Rural  | ~ 60%                     |
|                                     | Urban  | ~ 85%                     |
| Waste management (%)                | Composted  | -                         |
|                                     | Recycled   | 4 à 5%                    |
|                                     | Landfilled (CET)                                       | ~15%                      |
|                                     | Dumped   | ~ 80%                     |
| Estimate of annual public spending  | -  |                           |
| Growth of MSW                       | ~ 3 %  |                           |
| Medical waste                       | 37,000 tons/year                                       |                           |
| Industrial waste                    | 2,547,000 tons/year, including non-hazardous waste     |                           |
| Hazardous waste                     | 325,100 tons/year                                      |                           |

1- This is a statistical mean from two studies undertaken between 2007 and 2009, the 1st in the north and the 2nd in the south of the country.

## 2.1 Environmental and socioeconomic framework

Algeria is a vast country covering an area of more than 2,380,000 km<sup>2</sup>.

The territory is divided into 3 sets:

- The Tell (North): 4% of the territory;
- The Hauts Plateaux : 9% of the territory;
- The Sahara: 87% of the territory.

The country's population currently stands at 35 million.

The population is unevenly spread on the whole territory, since less than 4% of the Northern territory hosts some 65% of the whole population.

The urbanization rate is very high and it has surpassed 61% in recent years (the density is 300 inhabitants/km<sup>2</sup> in the North and 13 inhabitants/km<sup>2</sup> nationally). This has resulted in great pressure on the environment in the coastal areas.

Algeria counts 1,541 municipalities. 24 big cities, representing the chef-lieu of the governorates (wilaya), have more than 100,000 inhabitants and nearly 300 chef-lieu of municipalities have more than 20,000 inhabitants.

In 2009, the per capita GDP stood at US\$ 7,000 per year. The growth rate for that year was about 2.1%.

## 2.2 The waste management situation

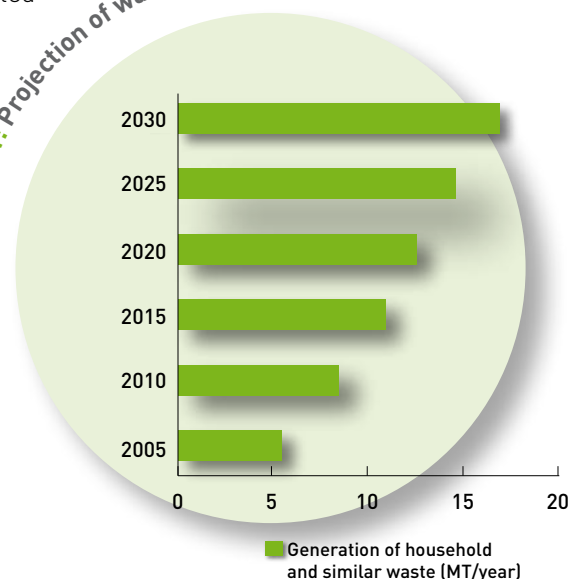
The quantity of municipal waste generated in Algeria is estimated at 8.5 million tons/year (household and similar waste). Each Algerian in urban areas generates about 0.7 kg of solid waste daily. In the capital (Algiers), this production is close to 0.9 kg/p/d.

Landfilling is the preferred final destination for the disposal of urban solid waste. The survey undertaken by the services of the Ministry of Land Planning and the Environment (MATE) has revealed more than 3,000 uncontrolled dumps throughout the country, occupying an area of more than 150,000 hectares and most often situated in agricultural land or along wadis (dry rivers). The latter are in such a poor state of insalubrity that they constitute a permanent danger to the environment and public health.

The future evolution of the overall quantity of waste generated by households, in principle, follows demographic evolution, population purchasing power (per capita GDP) and the quantity of products to be recovered. As shown in Figure 1, the annual generation of household waste will exceed 12 million tons in 2020, and approximate 17 million tons in 2030.

Overall industrial waste generation (including ordinary industrial waste) is estimated at about 2.5 MT/year. Special waste represents around 325,000 tons and medical waste with infectious potential (DASRI) is around 37,000 tons.

Figure 1: Projection of waste generation



## 3. CURRENT SOLID WASTE MANAGEMENT SITUATION

### 3.1. Policy, legal and institutional framework

#### Policy framework

The strategies and action plans are presented in Section 3.2.

#### Legal framework

The general legal framework for waste management is defined by:

- Law No. 01-19 of 12/12/2001 relating to the management, control and disposal of waste.
- Law No. 03-10 of 19/07/2003 relating to the protection of the environment within the framework of sustainable development.
- Executive Decree No. 02-175 of 20/05/2002 establishing the National Waste Agency.
- Executive Decree No. 04-410 of 14/12/2004 laying down the general rules for the development and operation of waste treatment facilities and the conditions for admitting such waste at these facilities.
- Executive Decree No. 07-205 of 30/06/2007 laying down the modalities and procedures for the preparation, publication and revision of the municipal scheme for the management of household and similar waste.

The management of packaging waste is governed by the following texts:

- Executive Decree No. 02-372 of 11/11/2002 relating to packaging waste.
- Executive Decree No. 04-199 of 19/07/2004 laying down the modalities for establishing, organizing, operating and financing the public system for the treatment and valorization of packaging waste "ECO-JEM".
- Executive Decree No. 04-210 of 28/07/2004 defining the procedures for determining the technical characteristics of packaging destined to directly hold food products or items meant to be handled by children.
- Ministerial Order of 06/04/2004 laying down the technical characteristics of plastic bags meant to directly hold food products.

The main contributions of these texts are summarized in Annex 1.

#### Institutional framework

##### Political level

The Ministry of Land Planning and the Environment (MATE) is responsible for the implementation of the Municipal Solid Waste Management National Program (PROGDEM).

### Implementation and performance of waste management

**The National Waste Agency (AND)** is the instrument of the Ministry of Land Planning and the Environment in terms of implementing the national waste policy. The mission of the agency is to support the local communities in waste management and to promote activities linked to integrated waste management. In this framework, it is responsible for promoting the activities of sorting, collection, valorization and disposal of waste and for establishing a public system for recovering, recycling and valorizing packaging waste, called ECO-JEM.

At the local level, the responsibility for the management and control of urban solid waste (USW) lies entirely with **municipalities**. However, given the noted dysfunction of this management, the municipalities have called for the improvement and professionalization of their management capacities, in particular in terms of: (i) reorganizing the municipal administration in charge of waste management, (ii) strengthening the waste collection and transportation capacity of the municipal services in charge of waste management; (iii) providing adequate collection equipment; (iv) developing a public awareness raising program; and (v) opening the public urban waste management system to private investment and concession .

At the level of each Wilaya (Governorate), the **Directorate of Environment** is the main body that controls the implementation of the laws and regulations relating to the protection of the environment. It implements MATE's action plan and issues visas in line with environmental legislation. It also participates actively in the development program of the Wilaya and, in coordination with other State bodies, takes the necessary measures to prevent and combat all forms of degradation, pollution and nuisance.

The **Ministry of the Interior and Local Communities (MICL)** ensures financial and logistical support for the proper functioning of municipalities.

The **National Conservatory for Environmental Training (CNFE)** organizes for the local authority staff training courses on the management of urban solid waste and engineered landfills (CETs). No less than 2000 technical staff and municipal officers have received training since its inception in 2003.

## 3.2. Strategy, action plans and priorities

The **Municipal Waste Management National Program (PROGDEM)**<sup>2</sup> was launched in 2002.

This program aims to:

- reinvigorate the role of municipalities in waste management;
- improve the waste management infrastructure (CETs, sorting centers, landfills, etc.);
- stimulate private sector participation and job creation in the sector;
- improve local tax collection, etc.

The program has made it possible to:

- develop master schemes for more than 900 out of the existing 1541 municipalities;
- launch the building of nearly 100 CETs and a similar number of controlled landfills;
- build about ten sorting centers;
- launch the rehabilitation of crude dumps (the Biskra dump has been completed, and the Oued Smar dump is in progress).

By 2014, the 14 most important dumps across the country will be rehabilitated, while the number of Class 2 CETs will exceed 300 and will, therefore, handle more than 75% of household and similar waste.

2- This program is an extension of Law No. 01-19 of 12 December 2001 relating to the control and disposal of waste.

The **Industrial and Special Waste Management National Program (PNAGDES)** is aimed at the control and disposal of special industrial waste and potentially infectious healthcare waste (DASRI).

Annex 3 presents details of the Algerian national strategy for waste management.

### 3.3. Planning and investments

In the context of the economic recovery program, the government has allocated an important budget to implement the PROGDEM in all the wilayas of the country. Other funds have also been allocated to the big cities of Algiers, Oran, Constantine and Annaba, with contributions and participation from partner countries and donors.

The budgets allocated till today have allowed several cities to finalize their waste management plans and to start developing the controlled landfills in accordance with Law No. 01-19 relating to waste management.

#### Collection planning

The Ministry of the Interior and Local Communities (MICL) has mobilized funding for strengthening the municipal waste removal fleet in a very large number of municipalities. This is a case of planning and an investment program that respond to an urgent, priority issue.

Outside this special operation, the normal procedure is the annual planning of the municipal budget, which is prepared by the municipality and forwarded to the Wilaya, which reviews it in terms of its budget lines which are, themselves, allocated by the government. Financial assistance of up to 30 million AD (over three years) are planned for each EPIC (public industrial and commercial institution) that is established to manage engineered landfills (CETs).

#### Waste transfer and treatment planning

In the framework of the PROGDEM, there has been a plan to strengthen the means to manage waste (CETs, waste reception centers, transfer stations). Details of this planning are given in Annex 4.

### 3.4. Finance and cost recovery

#### SWM financing

The USW infrastructure is financed primarily by the State. The investments mobilized for the period 2001-2010 through various programs (FSDRS, PSRE, PSD, FEDEP, etc.) amount in terms of operation registration, to nearly **50 billion AD** (1 € = ~ 80 AD).

Note that the municipal waste management expenses are only partially covered by the garbage removal tax, which is set annually between 400 and 1000 AD per household. The average recovery rate of this tax is too low and covers only a minimal percentage of waste management. The deficit is filled by the Common Fund for Local Communities (FCCL) which contributes up to 20-25% of the total municipal income.

#### SWM costs

The cost of urban solid waste management (collection, transportation and disposal) is still not well-determined. According to the National Waste Agency (AND), the average treatment and disposal cost for a ton of waste is between **1500** and **2000 AD** (not including depreciation).

For large cities like Algiers, according to two recent studies, the cost of waste management (collection, transportation and disposal) is estimated at more than **4000 AD/ton** in B.O.T. (Build, Operate and Transfer).

- The landfilling cost of one ton of waste at a CET is estimated at **900 AD** (MATE);
- The cost of collection and transportation is estimated at **~ 2900 AD**.

### 3.5. Private sector participation

Solid waste management in Algeria has remained till today in the public sector domain. The private sector's contribution is limited and often comes in the form of informal activities involving the anarchical recovery of recyclable waste in public dumps.

The authorities have decided to promote incentive schemes to encourage the participation of this sector (establishing micro-enterprises) in the activities related to waste management through contracts and concessions. The activities of collection, sorting, recycling and landfill operation may be open to outsourcing.

It is noteworthy that in 2008, 873 approved collectors spread out all over the country were identified. The National Fund for Environment and Cleanup (FEDEP), the National Waste Agency (AND) and the National Agencies for Supporting Youth Employment (ANSEJ) and for Development of Investment (ANDI) are called upon to contribute to the support and implementation of viable projects.

### 3.6. Public awareness and community participation

In order to develop an eco-citizen behavior, the country has embarked in recent years on major campaigns to raise awareness and gain public support for actions planned.

**Table 2: Organizations undertaking awareness raising actions**

| Target public   | Organizations undertaking awareness raising actions   |
|-----------------|---|
| Public at large | NGOs<br>The National Conservatory for Environmental Training (CNFE)<br>Environmental cells in the larger municipalities |
| Youth           | Basic and secondary schools (An agreement has been signed by the heads of the Environment and Education sectors)        |

### 3.7. Capacity building and training requirements

Waste management capacity is still relatively low, be it in management, management of CETs in operation or even in recycling and/or valorization activities.

At the level of management, problems arise at different levels, in project management, cost calculation, and certainly in future privatization actions.

At the institutional and legal level, deficiencies appear in several domains, from understanding and interpreting laws to utilizing economic and financial instruments. Popularization actions are, therefore, necessary.

To establish a system for delegating environmental services, the authorities have offered training programs through the CNFE for the benefit of local authorities in order to improve managerial competencies (technical staff and elected officers) in the management of urban solid waste.

## 4. INDUSTRIAL AND HAZARDOUS WASTE MANAGEMENT

### Generation of industrial and hazardous waste

According to the national cadastre for special waste prepared in 2007, the overall generation of industrial waste, including non-hazardous and inert industrial waste is 2,547,000 tons per year, with a stock quantity of 4,483,500 tons.

The hazardous waste generated amounts to 325,100 tons per year. The quantities of waste in stock and awaiting a disposal solution amount to 2,008,500 tons.

### Management of industrial and hazardous waste

Algeria has accumulated a significant delay in the management of industrial and hazardous waste. Thus, it is confronted with the generation and storage of an important quantity of industrial waste, of which hazardous waste constitutes a serious threat to public health, to the quality of the environment and to the preservation of natural resources.

Two Class I CETs are being built, the first in the Tébessa region (in the North-East), and the second in the Ghazaouat (Tlemcen) in the West.

## 5. MEDICAL WASTE MANAGEMENT

### Generation of medical waste

An estimate of the National Waste Agency (AND) has evaluated the generation of potentially infectious waste from healthcare activities (DASRI) to be about 37,000 tons.

### Management of medical waste

The management of waste resulting from healthcare activities causes serious problems, particularly due to the non-implementation of regulations and the lack of a specific definition of responsibilities. The lack of service-providing operators in this domain further aggravates these problems.

Even though responsibility falls to healthcare institutions exclusively, the incinerators available are too few to satisfy the demand. Out of the 178 incinerators installed, only 131 are working, of which 70% are used as burners. It is noteworthy that a good part of this waste ends up in landfills.

## 6. OPTIONS FOR IMPROVEMENT AND DEVELOPMENT

Through the regulatory measures implemented, the Algerian policy enshrines the basic principles of environmentally sound waste management through:

- i. the prevention and reduction of waste generation and harmfulness at the source;
- ii. the organization of sorting, collection, transportation and disposal of waste;
- iii. the rehabilitation of uncontrolled dumps and their restitution to the urban landscape for the benefit of healthy activities.

In our opinion, this definitely requires:

- the optimization of existing services;
- building national and local capacities;
- encouraging the private sector to participate actively in this area; and
- raising citizen awareness to reduce waste.

## 7. TECHNICAL ASSISTANCE PARTNERS AND DONORS

In Algeria, cooperation, international aid and international loans for waste management are minimal in comparison to State investment. The few projects and programs have a bearing on national capacity building in terms of training and expertise.

## 8. OPPORTUNITIES OF NETWORKING AND PARTNERSHIP

The discussion of partnership opportunities in the context of SWEEP-Net is summarized in the minutes of the meeting of experts shown in Annex 11.

## ANNEX 1: LEGAL FRAMEWORK FOR SWM (SOME LAWS AND DECREES)

| Type of instrument                              | Name of instrument  | Types of waste treated   | Functional responsibilities  | Elements of solid waste management   |  |   | Other   |
|---|---|--|--|--|--|---|---|
|   |   |  |  | Components of the waste management system  | Institutional roles  | Availability of funds and cost recovery   |   |
| <b>Environment</b>                              |   |  |  | <b>and other laws</b>  |  |   |   |
| Law 01-19 of 12 December 2001                   | Law relating to the management, control and disposal of waste   | <ul style="list-style-type: none"> <li>Household and similar waste</li> <li>Special waste</li> <li>Medical waste</li> <li>Inert waste</li> </ul> | Policies and regulations   | <ul style="list-style-type: none"> <li>Collection, sorting and transportation</li> <li>Treatment, valorization and disposal</li> <li>Information and awareness raising</li> <li>National plan for waste management</li> <li>Municipal scheme for waste management</li> </ul> | <ul style="list-style-type: none"> <li>MATE</li> <li>Ministry of the Interior and Local authorities</li> <li>Ministry of Health</li> <li>Municipalities</li> <li>Local finance and tax services</li> <li>Environmental police and gendarmerie</li> </ul> |   |   |
| Law 01-21 of 22 December 2001                   | Finance Law for 2002  | <ul style="list-style-type: none"> <li>Municipal waste</li> <li>Industrial waste</li> <li>Medical waste</li> </ul>                               | <ul style="list-style-type: none"> <li>Indirect taxes / tax provisions</li> </ul>                                    | <ul style="list-style-type: none"> <li>Tax on removal of municipal waste</li> <li>Tax incentives for destocking special waste</li> <li>Tax allocation</li> </ul>   | <ul style="list-style-type: none"> <li>Ministry of Finance</li> <li>MATE</li> <li>Local authorities</li> <li>Local finance and tax services</li> </ul>   | Law permitting partial recovery of municipal spending through the waste removal tax.<br>Rates applied:<br>Household: 500-1000 AD/year<br>Commercial premises: 1000-10000 AD/year<br>Trades/<br>Important handicrafts: 2500-50000 AD | In addition to the municipal waste removal tax, 10 % of the other taxes are allocated to the municipality |
| Law 03-10 of 19 July 2003                       | Law relating to the protection of the environment in the framework of sustainable development   | Overall protection of the environment  | <ul style="list-style-type: none"> <li>Implementation of the National Policy for Environmental Protection</li> </ul> |  | <ul style="list-style-type: none"> <li>Polluter payer principle</li> <li>Non-degradation principle</li> <li>Substitution principle</li> <li>Precaution and substitution principle.</li> </ul>  | <ul style="list-style-type: none"> <li>MATE</li> <li>Ministry of Finance</li> <li>Local authorities</li> <li>Other ministries</li> </ul>  |   |
| <b>Decrees</b>                                  |   |  |  |  |  |   |   |
| Executive decree No. 01-408 of 13 December 2001 | Modifying and completing Executive decree No. 98-147 of 13 May 1998 setting the operational modalities of the special allocations account No.302-065 called the National Fund for the Environment | Transforming the National Fund for the Environment into the National Fund for Environment and Cleanup (FEDEP)                                    | <ul style="list-style-type: none"> <li>Regulation</li> </ul>   | Waste management   | <ul style="list-style-type: none"> <li>Ministry responsible for the environment</li> <li>Ministry of Finance</li> <li>Walis</li> <li>Local finance and tax services</li> </ul>   | Funds with a budget of 3.5 billion AD (US \$44 million in 2002)   |   |
| Executive decree No. 02-115 of 3 April 2002     | The National Observatory for the Environment and Sustainable Development (ONE-DD)   | All types of waste   |  | Data base<br>Monitoring and control of generated pollutions  | <ul style="list-style-type: none"> <li>MATE</li> <li>Wilaya environmental inspections</li> </ul>   | EPIC :<br><ul style="list-style-type: none"> <li>State subsidies</li> <li>Autofinancing</li> </ul>  |   |
| Executive decree No. 02-175 of 20 May 2002      | Establishing the National Waste Agency (AND)  | <ul style="list-style-type: none"> <li>Municipal waste</li> <li>Industrial waste</li> </ul>  |  | Promoting activities of: sorting, collection, transportation, treatment and disposal of waste  | <ul style="list-style-type: none"> <li>MATE</li> <li>Local communities</li> </ul>  | EPIC :<br><ul style="list-style-type: none"> <li>State subsidies</li> <li>FEDEP contributions</li> <li>Autofinancing</li> </ul>   |   |

| Type of instrument                                  | Name of instrument  | Elements of solid waste management                                       |  |   |   |   | Other  |
|---|---|--|--|---|---|---|--|
|   |   | Types of waste treated   | Functional responsibilities  | Components of the waste management system       | Institutional roles   | Availability of funds and cost recovery |  |
| Executive decree No. 02-262 of 17 August 2002       | Establishing a National Center for Cleaner Production Technologies (CNTPP)  | Industrial waste   | Prevention and reduction of waste<br>Recycling, Valorization                             |   |   | • MATE                                  | EPIC:<br>• State subsidies<br>• FEDEP contributions<br>• Autofinancing |
| Executive decree No. 02- 263 of 17 August 2002      | Establishing a National Center for Environmental training (CNFE)  | • Municipal waste<br>• Industrial waste<br>• Medical and hazardous waste | Training, improvement and awareness raising in the domain of integrated waste management |   |   | • MATE                                  | EPIC:<br>• State subsidies<br>• Autofinancing                          |
| Executive decree No. 02-372 of 11 November 2002     | Laying down the modalities for the valorization of packaging waste  | Packaging waste  | • Regulation   | • Recovery and valorization<br>• ECO-JEM system | • MATE<br>• National Waste Agency (AND)   | • FEDEP subsidies                       |  |
| Executive decree No. 04-199 of 19/07/2004           | Laying down the modalities for establishing, organizing, operating and financing the public system for, the treatment and valorization of packaging waste "ECO-JEM"         | Packaging waste  | • Regulation   | • Recovery and valorization<br>• ECO-JEM system | • MATE<br>• National Waste Agency (AND)   |   |  |
| Executive decree No. 04-210 of 28/07/2004           | Defining the modalities for determining the technical characteristics of packaging destined to directly contain food products or objects destined to be handled by children | Packaging waste  | • Regulation   |   |   |   |  |
| Executive decree No. 04-410 of 14/12/2004           | Laying down the general rules for developing and operating waste treatment facilities and the conditions for admitting this waste at these facilities                       | • Municipal waste<br>• Industrial waste                                  | • Regulation   | Landfilling                                     |   |   |  |
| Executive decree No. 07-205 of 30/06/2007           | Laying down the modalities and procedures for the preparation, publication and revision of the municipal household and similar waste management scheme                      | • Municipal waste<br>• Industrial waste                                  | • Regulation   | Municipal scheme for waste mangement            | • MATE<br>• Local authorities   |   |  |
| <b>Other (Policy, bill, draft regulation, etc.)</b> |   |  |  |   |   |   |  |
| National report                                     | Report on the current state and future of the environment (2001)  | All types of waste   | State of the art and perspectives  | Overall waste management                        | • Government<br>• MATE  |   |  |
| National Environmental Strategy                     | National Plan for Environmental Actions and Sustainable Development over a decade (PNAE-DD) - 2002  | All types of waste   | Strategy and orientations  | Integrated waste management                     | • Government<br>• Wilayas and local authorities<br>• Economic and industrial sectors<br>• Participation of foreign partners |   |  |
| Guide (April 2001)                                  | On environmental impact studies   | Household waste and treatment facilities                                 | Guide, Procedures and orientations   | Treatment and disposal facility                 | • MATE<br>• Local authorities<br>• Wilaya<br>• Environmental Inspections  |   |  |

## ANNEX 2: INSTITUTIONAL FRAMEWORK

| Contact person                 | Position                           | Institution   | E-mail                                       |
|--------------------------------|------------------------------------|---|--|
| Tolba Tahar MATE               | Deputy Director                    | MATE  | ttolba33@hotmail.com                         |
| Gourine Lazhari                | Director General, AND              | National Waste Agency (AND)                             | goula51@yahoo.fr                             |
| Khardine Med Larbi             | Director General, CNFE             | National Conservatory for Environmental Training (CNFE) | k.m.l@cnfe.org.dz<br>cnfe.formation@yahoo.fr |
| 48 Directorates of Environment | Directors of Environment (Wilayas) | MATE or Wilayas   | ttolba33@hotmail.com                         |

## ANNEX 3: STRATEGIES, ACTION PLANS AND PRIORITIES

| Waste management component         | Nature of strategy/ priority  | Articulation of the strategy/priority  |
|------------------------------------|---|--|
| Policy and institutional framework | Promotion of integrated waste management through the implementation of the National Program for Integrated Municipal Waste Management (PROGDEM) which induced a reinvigoration of the role of the municipality, a gradual improvement of local tax recovery and the integration of delegated service management. This program requires a greater mobilization of financial resources and also aims at stimulating private sector adhesion to activities linked to waste management.   | <ul style="list-style-type: none"> <li>• Law 01-19 of 12 December 2001</li> <li>• Law 01-21 of 22 December 2001</li> <li>• Decree 84-378 of 15 December 1984</li> <li>• Decree 02-175 of 20 May 2002</li> <li>• Etc.</li> </ul>  |
| Financing and cost recovery        | Relying on economic instruments and on environmental taxation in order to gradually achieve expenditure coverage (implementation of the polluter payer principle). Improving, as a first step, the recovery rate of the current household waste removal tax. The rate of recovery of this tax stands presently at an average of less than 30%. To this tax must be added the revenue from partial contributions of other environmental taxes (10% of tax incentive for cleanup are returned to the Municipality)  | <ul style="list-style-type: none"> <li>• Law 01-19 of 12 December 2001</li> <li>• Law 01-21 of 22 December 2001</li> </ul>   |
| Private sector participation       | Given the poor performance of the public sector, authorities have decided to promote incentive schemes to encourage private sector participation (establishing micro-enterprises) in activities linked to waste management. The will to operate progressively within this approach has often been reiterated by the supervising ministry.   | <ul style="list-style-type: none"> <li>• Law 01-19 of 12 December 2001</li> <li>• Law 01-03 of 2 August 2001 relating to promoting investment</li> <li>• Executive Decree No. 02-372 of 11 November 2002</li> <li>• Decree 02-175 of 20 May 2002</li> <li>• Executive Decree No. 01-408 of 13 December 2001</li> </ul> |
| Communication                      | To ensure the success of the PROGDEM, communication –awareness raising, training locally elected officials and involving the population and NGOs are actions that are readily recognized by the authorities as highly important. The municipalities are called upon to devote a section of their budget to awareness raising. Active NGOs, which are quite numerous, may, within the FEDEP framework, receive subsidies for actions that can improve household waste management. Note also the gradual introduction of environmental education in the school curriculum (Agreement of March 2002 between the Ministry of National Education and the Ministry of Land Planning and the Environment). | <ul style="list-style-type: none"> <li>• Law 01-19 of 12 December 2001</li> <li>• Executive Decree No. 02- 263 of 17 August 2002</li> <li>• Elements of the PNAE-DD</li> </ul>   |

| Waste management component      | Nature of strategy/ priority  | Articulation of the strategy/priority   |
|---------------------------------|---|---|
| SWM technologies and components | <p>The preparation of Master Schemes for waste management in 908 municipalities (study completed), out of the existing 1541.</p> <p>There are plans until 2010 to:</p> <ul style="list-style-type: none"> <li>• Build 97 engineered landfills (CETs, developement work has been completed or is in the final stages for more than 70%);</li> <li>• Establish 102 controlled dumps (50% have been completed or are nearing completion);</li> <li>• Rehabilitate the Oued Smar dump (Algiers), work is in progress;</li> <li>• Undertake the implementation of waste reception centers in several Wilaya centers (chef-lieu).</li> </ul> <p>On the level of recycling/valorization (the potential for recyclable materials is estimated at 760,000 T/year), the authorities are working on the promotion of this sector through information, financial support, assistance and several incentive schemes (Micro credits managed by the National Agency for Supporting Youth Employment, ANSEJ; the National Waste Agency, AND, the National Fund for Environment and Cleanup FEDEP; etc.)</p> <ul style="list-style-type: none"> <li>• 873 approved collectors in 2008. These waste recovery agents are spread all over the country.</li> </ul> | <ul style="list-style-type: none"> <li>• Law 01-19 of 12 December 2001</li> <li>• Executive Decree No. 02-372 of 11 November 2002</li> <li>• Finance Law 2003</li> <li>• PROGDEM</li> </ul> |

## ANNEX 4: SOLID WASTE MANAGEMENT PLANNING AND INVESTMENT PROGRAM

| PLANNED INVESTMENT  |   |  |
|---------------------|---|--|
| Institutional level | Action  | Requirement of proposed investment   |
| National            | Establishing, in 2002, within the framework of the National Plan of Environmental Action and Sustainable Development (PNAE-DD), a national priority program for Integrated Household Waste Management: PROGDEM (MATE and the Ministry of the Interior and Local Communities)                              | <ul style="list-style-type: none"> <li>- Preparation of the Master Schemes for the 1541 municipalities;</li> <li>- Establishing more than 90 engineered landfills (CETs);</li> <li>- Equipping CETs with rolling stock (compactor, loader, tank truck).</li> </ul> |
|                     | <ul style="list-style-type: none"> <li>- Strengthening the waste removal fleet for the benefit of local authorities. Operation undertaken by the Ministry of the Interior and Local Communities;</li> <li>- Providing an operating budget for the newly established EPIC over a 3 year period.</li> </ul> | <ul style="list-style-type: none"> <li>- Purchase of 1000 packer bin vehicles;</li> <li>- Providing CET-managing EPICs with an amount of 30 million AD over 3 years</li> </ul>   |
|                     | <ul style="list-style-type: none"> <li>- Waste reception centers 48</li> <li>- Transfer stations 10</li> </ul>  | <ul style="list-style-type: none"> <li>- Technical specifications in preparation</li> </ul>  |
| Wilaya              | <ul style="list-style-type: none"> <li>- Rehabilitation of the Oued Smar – Algiers dump;</li> <li>- Sorting plant – Algiers - 7</li> </ul>  | Rehabilitaion work in progress   |

## ANNEX 5: FINANCING AND COST RECOVERY

|  |  |
|--|--|
| Budget allocations by the central government               | Generally on the State budget  |
| Budget allocations by the municipalities and governorates  | In part  |
| Cost of collection and transportation for one ton of waste | 3000 AD in Algiers   |
| Cost of disposal (landfilling) for one ton of USW          | 1000 AD in Algiers   |
| Cost per ton from collection to disposal/treatment         | about 4000 AD for Algiers  |
| Total cost recovery per year                               | 400 - 1000 AD (waste removal tax) per household<br>+ 3500 AD (cleansing tax) |

## ANNEX 6: PRIVATE SECTOR PARTICIPATION

| Type of need for capacity building | Need for capacity building at different institutional levels |             |                            |           |
|------------------------------------|--|-------------|----------------------------|-----------|
|                                    | National   | Governorate | The greater municipal area | Municipal |
|                                    |  |             |                            |           |

N.B.: Private sector participation is practically nil. The State is in charge of USW management through public companies.

## ANNEX 7: PUBLIC AWARENESS AND COMMUNITY PARTICIPATION

| Activities and programs of ps & cp in the sw sector      | Key partners (NGOs/programs, key players)   |  |
|--|---|--|
|  | Contact person  |  |
| Awareness raising, workshop, study day, newsletter, etc. | M. N. Bendaoud<br>Ecological Association of Boumerdes (AEB)   |  |
| Awareness raising, workshop, study day, etc.             | M. Halimi<br>Environment Protection Association of Annaba (APEP)<br>Mme Lamri<br>Rayon de soleil<br>Ouled Fayet - Algiers |  |
| Awareness raising, volunteer participation               | Scouts  |  |
| Friday sermons   | Association of Imams  |  |

## ANNEX 8: CAPACITY BUILDING AND TRAINING REQUIREMENTS

| Theme   | Partners and beneficiaries |       |   |                         |
|---|----------------------------|-------|---|-------------------------|
|   | NATIONAL                   | Local | Institution   | Beneficiary             |
| Waste management                                  | x                          | x     | CNFE, INSFP (Specialized Institute for Vocational Training) | Local authorities, NGOs |
| Capacity building for integrated waste management | x                          | x     | CNFE, INSFP   | Technical staff,        |
| Training of municipal elected officials and staff | x                          | x     | CNFE  | Local communities       |
| Capacity building on the selection of equipment   |                            | x     | INSFP   | CET managers            |

## ANNEX 9: INDUSTRIAL AND HAZARDOUS WASTE MANAGEMENT

| Type of waste   | Estimated quantity  | Treatment technology | Name of treatment center | Location | Person in charge |
|---|---|----------------------|--------------------------|----------|------------------|
| Waste resulting from disposal of appliances containing polychlorinated biphenyl (PCB) | <ul style="list-style-type: none"> <li>• 6,770 electrical appliances</li> <li>• 2,994 tons of oils contained in the appliances</li> </ul> | Temporary storage    |                          |          |                  |
| Used oils   | 57,000 tons   |                      |                          |          |                  |
| Liquid waste  | 100,000 tons  |                      |                          |          |                  |
| Obsolete pesticides   | Stock of 2,360 T  | Temporary storage    |                          |          |                  |

## ANNEX 10: DONOR/LENDER ACTIVITIES FOR SOLID WASTE MANAGEMENT

| Donor/lender                             | Nom du projet  | Project implementation/ date project ends | Project location | Total and financial budget scheme | Project objectives | Contact resource person, tel, e-mail |
|--|----------------|---|------------------|-----------------------------------|--------------------|--------------------------------------|
| Essentially the State                    |                |   |                  |                                   |                    | M. Tolba –<br>M. Gourine             |
| Cooperation with Belium<br>GTZ (now GIZ) | CET<br>Mascara |   | Mascara          |                                   |                    |                                      |

## ANNEX 11: MINUTES OF THE SWEEP-NET MEETING

In order to promote the adoption of an integrated and sustainable management of solid waste in the region (Maghreb et Mashreq), within the framework of SWEEP-Net, a meeting was held on June 2nd, 2010 at the Hotel Mercure (Algiers) and it was attended by seventeen (17) national experts.

### Objectives of the meeting:

- Establish a network of national experts, forming the nucleus of knowledge and expertise, whose role is to provide technical support and counseling services for the promotion of Integrated Solid Waste Management (ISWM) in Algeria;
- Promote regional exchanges of information and experience relating to the waste sector;
- Create the necessary conditions and context for investment in the urban solid waste sector with the contribution of regional and international financial institutions.

A group meeting was scheduled for the end of June 2010 at the level of the National Waste Agencies (NWAs) for the purpose of consulting one another and furthering discussions on the opportunities for establishing this network, strengthening the group and drawing up a roadmap in terms of the priorities to undertake in the context of a national network.

### Meeting process

- Welcome speech (Mr. Gourine Lazhari), National Coordinator
- Presentation of the waste management situation in Algeria (Mr. Kehila Youcef), consultant.
- Presentation of SWEEP-Net (Mr. Ismail Anis), SWEEP-Net General Secretary;
- Presentation of the role of GTZ in funding the network (Mr. Luecke Markus), Head of Mission, GTZ.

### Outcomes

After a wide-ranging discussion on the importance of a controlled management of solid waste, given their impact on the environment and public health, a unanimous decision was reached to set up a network of national experts. All participants in this meeting (see attached attendance sheet) agreed to be part of this 1st nucleus of the network. It is understood that this list is not exhaustive and remains open to other experts wishing to be part of the group.

A meeting of the group is scheduled for the end of June 2010 at the level of the National Waste Agency (NWA) for the purpose of consulting one another and furthering discussions on the opportunities for establishing this network, strengthening the group and drawing up a roadmap in terms of the priorities to undertake in the context of a national network.

*N.B.: Participants were asked to prepare their CVs for them to be included in the SWEEP-Net database.*

**«SWEEP-net» Attendance sheet - meeting of 02 June 2010**  
**Experts «the waste domain»**

| N° | First & Last Name | Organization                                  | E-mail                    |
|----|-------------------|---|---------------------------|
| 1  | GOURINE Lazhari   | D.G. AND National Coordinator                 | goula51@yahoo.fr          |
| 2  | BOUHADIBA Brahim  | Teacher-researcher U.S.T.Oran                 | bouhadiba2007@yahoo.fr    |
| 3  | BENHAMZA Moussa   | Teacher-researcher Université Annaba          | moussa_benhamza@yahoo.fr  |
| 4  | MEZOUARI Fadila   | Teacher-researcher<br>EPAU - Algiers          | Fadila_mezouari@yahoo.fr  |
| 5  | ABBADIE Mona      | Teacher-researcher,<br>ENS-Bouzareah, Algiers | m_abbadie2001@yahoo.fr    |
| 6  | ROUIBI Abdelhak   | Teacher-researcher Université Blida           | a_rouibi@yahoo.fr         |
| 7  | MAKHOUKH Ouamer   | Sanitary engineer                             | makhoukh_ouamer@yahoo.fr  |
| 8  | NAMANE Abdelkader | Teacher-researcher ENP - Algiers              | namaneaek@yahoo.fr        |
| 9  | KEHILA Youcef     | Teacher-researcher EPAU - Algiers             | kehilayoucef@yahoo.fr     |
| 10 | OUAMANE Karim     | Director of Waste Reception Center - Blida    | Karim_ouamane@yahoo.fr    |
| 11 | HALIMI Ali        | Environment Protection Association<br>Annaba  |                           |
| 12 | LUECKE Markus     | Head of mission GTZ                           | markus.luecke@gtz.de      |
| 13 | ISMAIL Anis       | Secretary General SWEEP-Net                   | Anis.ismail@sweep-net.org |
| 14 | HASSIBA Sayah     | Counseling company Environnement              | H_sayah@yahoo.fr          |
| 15 | NACEUR Yasmina    | Head of Department CNL                        | naceuryasmina@yahoo.fr    |
| 16 | MBIKCHI Djahida   | CNL   | dobikchi@yahoo.fr         |
| 17 | BELALIA Ahmed     | Dir. Net-Com (Algiers)                        | belalianetcom@yahoo.fr    |

## ANNEX 12

Table 1: Non-exhaustive List of National Experts

| N° | First & Last Name | Organization  | E-mail                        |
|----|-------------------|---|-------------------------------|
| 1  | BOUHADIBA Brahim  | U.S.T.Oran<br>Général Environnement Annaba            | bouhadiba2007@yahoo.fr        |
| 2  | LOUDJANI Fayçal   | ENS- Bouzareah, Algiers                               | generalenvironnement@yahoo.fr |
| 3  | ABBADIE Mona      | Director of Waste Reception Center<br>- Blida         | m_abbadie2001@yahoo.fr        |
| 4  | OUAMANE Karim     | Consultant  | Karim_ouamane@yahoo.fr        |
| 5  | SINI nordine      | Université de Annaba                                  | nordinesini@yahoo.fr          |
| 6  | BENHAMZA Moussa   | Université Tizi Ouzou                                 | moussa_benhamza@yahoo.fr      |
| 7  | DERRIDJ Arezki    | EPAU  | aderridj@yahoo.fr             |
| 8  | KEHILA Youcef     | MATE  | kehilayoucef@yahoo.fr         |
| 9  | TOLBA Tahar       | Université de Blida                                   | ttolba33@hotmail.com          |
| 10 | ROUIBI Abdelhak   | Sanitary engineer                                     | a_rouibi@yahoo.fr             |
| 11 | MAKHOUKH Ouamer   | ENP - Algiers   | makhoukh_ouamer@yahoo.fr      |
| 12 | NAMANE Abdelkader | Université de Blida                                   | namaneaek@yahoo.fr            |
| 13 | INAL Dalila       | Université de Chlef                                   | dalilainal@hotmail.com        |
| 14 | TAHRAOUI Naima    |   | tahraouidn@yahoo.fr           |
| 15 | CHANANE Kamel     | Bureau d'Etudes Environnement<br>(Consulting company) | kamelchanane@hotmail.com      |
| 16 | HELLA A           | ENP - Algiers   | ENP - Alger                   |
| 17 | MISSOUM Hanifi    | Univ. Mostaganem                                      | Université Mostaganem         |
| 18 | HARIK Djamila     | ENP- Algiers  | ENP- Alger                    |
| 19 | DJEBRANI Mohamed  | INRA- Algiers   | INRA- Alger                   |
| 20 | BOUDAH Soulimane  | USTHB- Algiers  | USTHB- Alger                  |
| 21 | MEZOUARI Fadila   | EPAU - Algiers  | fadila_mezouari@yahoo.fr      |
| 22 | SADOUN Djamila    | Université de Béjaia                                  | Université de Bejaia          |
| 23 | HASSIBA Sayah     | Cabinet conseil Environnement<br>(Consulting company) | H_sayah@yahoo.fr              |

**Table 2: Consulting companies -USW, (Consulting companies - Algeria).  
Non-exhaustive list**

| N° | First & Last Name       | Activities                   | Email                          |
|----|-------------------------|------------------------------|--------------------------------|
| 1  | NEGHCHE Kamel           | B. Etudes Environnement      | math.cirta@caramail.com        |
| 2  | MEDERREG Omar           | B. Etudes Veritex            | bureau.veritex@caramail.com    |
| 3  | LOUDJANI Fayçal         | Général Environnement Annaba | generalenvironnement@ yahoo.fr |
| 4  | Chelghoum Djamel Eddine | Sarl Amenhyd<br>Consul       | amenhyd@amenhyd.com            |

**Table 3: Ministry/Institutions and Environmental Administrations**

| N° | First & Last Name              | Responsibilities                   | Institution   | Email  |
|----|--------------------------------|------------------------------------|---|--|
| 1  | Tolba Tahar                    | Deputy Director MATE               | MATE  | ttolba33@hotmail.com                         |
| 2  | Gourine Lazhari                | Director General, AND              | National Waste Agency (AND)                             | goula51@yahoo.fr                             |
| 3  | Khardine Med Larbi             | Director General, CNFE             | National Conservatory for Environmental Training (CNFE) | k.m.l@cnfe.org.dz<br>cnfe.formation@yahoo.fr |
| 4  | 48 Directorates of Environment | Directors of Environment (wilayas) | MATE or Wilayas   | ttolba33@hotmail.com                         |

**Table 4: Private local and international operators in the USW domain**

USW is managed by services essentially related to the local authorities (municipalities) or to the Wilayas. Since 2008, public industrial and commercial enterprises (EPIC) have been established in the 48 Wilayas. Their role is to manage the CETs, in the first phase. Eventually, these enterprises will be charged with managing USW for the benefit of local authorities. Specifications are nonetheless being prepared to allow the private sector to participate fully in this domain alongside with the public sector.

**Table 5: Main studies done on USW**

| N° | Topic   | Date           | Beneficiary(ies) | Consultancy                                    | Key words   | Email                    |
|----|---|----------------|------------------|--|---|--------------------------|
| 1  | Study of the master scheme for waste management in 57 municipalities in the Wilaya of Algiers | 2005 - 2010    | Wilaya of Alger  | STUDI-International                            | Diagnosis, assessment, master scheme for USW management in the Wilaya of Algiers. | Mail: studi@studi.com.tn |
| 2  | Upgrading the CET of Ouled Fayet, Algiers   | 2008           | Wilaya of Alger  | Liban Consult Ingénieurs                       | Leachate, biogas, drainage  |                          |
| 3  | Technical expertise, to asses the design quality and implementation of 39 CETs                | 2003 - 2006    | Several Wilayas  | GTZ- Algeria                                   | CET, Expertise, design  | gtz-algerie@gtz.de       |
| 4  | Study on solid waste management in Algeria  | Nov. 2005      | MATE             | METAP  | Solid waste, management program, improving management                             | www.metap-solidwaste.org |
| 5  | Organization of the 1st Regional forum on Solid Waste Management (PRGDS)                      | 26/28 Jan 2004 | MATE             | METAP and International Consortium GTZ-ERM-GKW | PRGDS, integrated solid waste management  | www.metap-solidwast.org  |

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and expertise network in Mashreq and Maghreb countries

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