

## **CRITICAL ANALYSIS OF THE ALGERIAN STRATEGY FOR LOCAL WASTE MANAGEMENT: THE CASE OF THE PROVINCE OF TIZI-OUZOU**

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### **Abstract**

The purpose of this article is to provide an assessment of the Algerian policy of local waste management. Through a series of semi-direct interviews with a number of local actors (politicians, mayors, development agents) in three of the largest municipalities (local authority) of the province of Tizi-ouzou, we looked, first to analyze the degree of the efficiency of local policies and secondly, to provide a measure of the costs of the local waste management. Bottlenecks at the local level as well as at the national level are highlighted. Our research attempts, in the last point, to identify two possible ways of improving the local waste management through inter-municipal cooperation and rationalization of waste management costs.

**Keywords:** environment, local management, waste, Algeria

**JEL classification:** H7, Q5, O2

### **Introduction**

These recent years, the environment in Algeria knew a strong degradation at the same time as the acceleration in the economic growth of the country. Algerian Cities as well as countryside face an unprecedented degradation of their natural environments'. In front of this situation, the problem of waste management arises increasingly with acuteness. Environmental policies implemented within the framework of the national strategy are struggling to respond effectively to the exponential increase of all type of waste (Rahmani, 2002). The question of evaluation and prospects of current policies is at the center of researchers and policy concerns (Dorbane, 2004).

In this paper, we propose a critical analysis of the measures implemented through an assessment of their impact at local level. After a brief description of the fundamental principles of sustainable management of waste in a first point, we will take a critical look at the current environmental policy of Algeria. In a third point, we will evaluate the costs and limitations of the local waste management in the department of Tizi-ouzou. We dedicate the last point to offer some economic and political guidelines that can help and allow improving the current waste management in Algeria, particularly at the local level.

## **1. Fundamental principles of sustainable waste management**

In common parlance, the term waste refers to garbage, filth, trash, fall, chip and other residue rejected by, what is no longer usable or consumable and therefore does not have a value anymore. A waste is defined as any substance or object which the holder discards or intends or is required to discard, and thus it strikes a blow at the environment (MAET, 2003).

Therefore, from the 1970s, meetings and conferences are held (Stockholm Conference in 1972 and the 1992 Rio) to raise awareness and stimulate environmental preservation policies. The concepts of sustainable development, preservation of nature, right of future generations are then increasingly put to legislators and community concerns (Buclet, 2011). The concept of waste tends to change since it tends to become a real resource, or even a valuable product, a raw material that gradually enters a cycle of recovery and recycling (the stock of certain waste is already a reality). In this new context, the wastes produced are not wastes and the best waste is the one which is not produced.

Before drawing up the steps of the integrated wastes management, it is necessary to show the life cycle of a product to understand the need to consider the waste that results from the production process.

In fact, usually the industrial producer manufactures and markets a product without considering its future after use. At the end, when nobody wants a used product, it leaves the responsibility and the cost of eliminating it to the local authorities and the public treasury.

In advanced countries where environmental policies are already working, this happens differently due to new regulations that determine responsibilities (Burgnmeier, 1987). The producer ensures the product liability for all its life; this implies the responsibility for its good processing after use. The producer must estimate a product throughout its life cycle and thus support the cost of recycling or elimination, if the revaluation turns out to be impossible or economically unprofitable.

Waste management includes several principles obeying to an integrated management approach. They fit the context of sustainable development defined by the Brundtland Committee (1987) as "development that meets the present needs without compromising the ability of future generations to meet their own needs." These principles are put forward in the reports of international organizations that have a direct concern with the issue of sustainable development. This involves (Azzoun, 2002) :

- Prevention principle: The priority is given to reducing waste through the use of clean technologies and techniques reducing the harmfulness and quantity of waste;
- Polluter must pay principle: The general duty of care, at their expense, of the collection and treatment of waste by those who have generated them within the respect for the environment;
- Valuation principle: Current guidelines require states to first promote waste recycling, this disposal only intervene for wastes that are more likely to valuation at a reasonable economic cost.
- Proximity principle: The limited mobility of the waste. This responds to a local waste management appearing within sustainable local development logic.

The integrated waste management is based on the following principles (Azzoun, 2002) :

- Waste production should be reduced to the acceptable economic limits;
- The recovery and recycling of waste should be practiced within the limits of profitability;
- Waste that can't be avoided or recovered without prohibitive cost should be disposed of in a way that doesn't harm the environment;
- Among the existing methods to eliminate waste, we must choose the least harmful to the environment;
- Any disposal of raw waste that may degrade the natural environment must be avoided if possible by a pretreatment before discharge.

**Methodological box**  
**Survey research protocol**

**Objective:** local political Diagnosis waste management in Algeria through a survey of local authorities.

**Period:** September to November 2014

**Procedure:** Interview Grid

**Locations:** three municipalities in the province of Tizi-ouzou – Tizi-ouzou, Draa Ben Khedda and Tirmatine

**Data: nature and sources**

- **Primary:** through surveys by interviews with elected mayors and Development Officers.  
- **Secondary** through an evaluation of the national waste management policy, a press review and a literature research.

**Sample:** Thirty interviews with elected (10) officials, (9) mayors and development (11) agents.

**Representativeness:** Our sample represents three typical municipalities of Tizi-ouzou. A small one (Tirmatine), medium one (Draa-Ben-Khedda) and a large one (Tizi Ouzou). These municipalities reflect the territorial configuration within the predominantly mountainous department. Tirmatine is a small mountainous municipality with low resources and rugged terrain. Draa Ben Khedda is an average municipality located partly in hilly area and partly in plain area. While the Tizi-ouzou - town is the largest municipality in the department with also a relatively ragged terrain

**Method of administration:** Face to Face Interviews.

**Method of analysis:** interview data processing, analysis of common profile and diagnostic mechanisms of waste management costs through a reading grid adapted from the literature.

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**Limitations:** The limitations of this survey are related to the methodology because it is essentially qualitative

## **2. A critical look at the Algerian strategy for waste management**

The speed how the density of the Algerian population increased and the improvement of living standards, produce a permanent increase in waste (Hadjou, 2012). The strong urbanization, the waste through abandonment, introduction into the market of new non-biodegradable products such as plastics thus the low rate of recovery, are the main causes (Rahmani, 2002).

The amount of waste generated is expressed in weight or volume. However, because of their compressibility, only the weight is a reliable and readily measurable data. Then we express the quantities produced in Kg / habitant / day or per year. The amounts of garbage thus expressed in weight or volume produced per capita per day naturally vary from country to country. The rate varies from 0.35 kg / capita / day in the least developed countries to 1.1 or 1.2 kg / capita / day in the big cities of industrialized countries (Rahmani, 2002). The average annual rate of urban waste discharge is about 200 kg / capita / year, or about 5 million kg / year. This figure is to double if we consider all solid waste (household and similar waste and industrial waste).

In Algeria, the average amounts of household waste produced is estimated at 0.7 kg / capita / day (Chenane, 2007). This rate is much higher in urban centers such as Algiers, where he reached the rate of 1.2 kg / capita / day (Dorbane, 2004). These are high rates compared to the average for developing countries. This demonstrates the importance of environmental issues in Algeria.

In the Algerian context, it is appropriate to note that the conditions of collection, evacuation and disposal of municipal waste are deteriorating day by day. It is clear

that the population growth, rapid urbanization and the improvement of living conditions are causing higher and higher volumes of waste.

The human, material and technical means mobilized for the accomplishment of this public service mission are no longer suitable. This situation seems to have no improvement according to mayors surveyed. It tends rather to intensify in all cities of the country.

That is why the government tends to make the municipal waste management a priority area of work in its environmental strategy and action.

Law No. 01/19 of 12/02/2001 related to the management, control and disposal of waste is, in this respect, the starting point and the reference framework of the new policy in this matter.

The National Programme integrated municipal waste management "Le Programme national de Gestion intégrée des Déchets Municipaux" (PROGDEM), wants a phased implementation approach of the framework law.

The PROGDEM aims to eradicate certain phenomena causing the degradation of the environment in the Algerian cities and countryside's, following the wild dumps. It also attempts to reorganize the collection, transport and disposal of waste under conditions ensuring the safety the preservation of environmental health.

The translation of this program in the field shows a lot of limitations. Many authors (Dorbane, 2004), emphasize the inefficiency of the measures and the lack of rigor in the implementation. Many shortcomings have been identified from the viewpoint of the management of the collection and recycling. The collection process is facing a severe lack of resources for collection and transportation of waste especially in urban areas. While increasing amounts of waste dumped every day, the human and collection of materials remain inadequate. Waste disposal is thus carried out in difficult conditions, often in unsuitable trucks, letting out along the way a big part of their content.

Add to this, the virtual absence of consumer awareness campaigns in the production and disposal of waste. It seems that the current environmental policy toil to develop a true environmental culture among consumers. The regulation and enforcement are inefficient. Faced with these shortcomings, the urban and rural environment continues to deteriorate daily. Waste spread on public roads, rivers are polluted by discharges of solid and liquid waste, agricultural land and landscapes are completely affected.

Regarding waste disposal conditions, the situation is also of concern despite the efforts made (Rahmani, 2002). Similarly, we find in the country toxic waste from the economic activities and care facilities including biological waste which are dumped illegally at the same time as household waste (Dorbane, 2004).. This results in the emergence and development of uncontrolled activities of recovery of reusable materials.

The survey conducted by the MATE (**Ministère de l'Aménagement du Territoire et de l'Environnement**, Ministry of Spatial Planning and Environment) reported 2,100 illegal dumps in the country including 360 at level 40 major cities, occupying an area of 22,000 hectares. These dumps are often located along the wadis, or on agricultural land or livestock roads, or even in forest areas.

Waste management costs in Algeria in their fixed and variable components (taking into account the amortization of investments) are estimated by the MATE at 50 US \$ / ton, 4000 DA / tone (Rahmani, 2002). This gives an indication to target in the application of the polluter pays principle. However, the delineation of current costs is hampered by the practiced accounting framework (not taking into account the real value of assets). Estimates in some local authorities are raging between 1100 and 1500 DA / ton (Chenane, 2007).

Tax Abduction of Household Waste (TEOM : La Taxe d'Enlèvement des Ordures Ménagères), which was 350-500 DA / year / household was upgraded (**2001, Finance law**) at 500-1000 DA / year / household. His recovery rate remains low (20-30% on average). Even passed its maximum rate, fully recovered, it represents only 40% of the current service (Chenane, 2007).

The costs of services call for other tax revenues levied as much of the local government budget (15-20%).

In the following section, we provide a detailed analysis of the costs of waste management in local communities of the department of Tizi-ouzou. Our case study focuses on three communes of the department (Tizi-ouzou municipality, Draa-Ben- Khedda and Tirmatine) involved in the management of an inter-scale landfill.

### **3. Costs of the local waste management: the case of municipalities in the department of Tizi-Ouzou**

Our assessment of the Algerian public waste management policies in the field can be illustrated by a case study of local authorities in the department of Tizi-Ouzou. Indeed, the problem of waste management on this scale truly reflects the difficulties previously reported at the national level.

Our case study of municipalities in the department of Tizi-Ouzou shows the extent of waste material difficulties. At this department, the amount of waste generated per capita per day is estimated at 0.7 Kg (Chenane, 2007). In relation to the total population of the department (about one million and three hundred thousand inhabitants), this gives a total daily amount waste production of around 910 tons.

Official data from the Environment supervision of the department of Tizi-Ouzou, report 34 landfills of which 29 are run by municipalities (municipalities management mode) and 5 by the inter-municipalities management mode (Dorbane, 2004). The local authorities note 15 uncontrolled dumps. These data significantly underestimate the number of dumps (Chenane, 2006). According to our own surveys, the number of illegal dumps amounts is at least 4,200 uncontrolled landfills. The province has indeed nearly 1,400 villages, each of which has at least three dumps more or less important depending on the number of inhabitants.

The issue of waste management at the level of Tizi-Ouzou department, arises thus with acuteness, both at the collection and transport but also in storage, disposal and recycling. Elected officials and leaders of the 67 municipalities of the department of Tizi-Ouzou, are trying to find adequate solutions but without much success. Indeed, the proliferation of illegal dumps in the department and the sharp deterioration in urban and rural landscapes reflect the inability of national and local policies to deal with the problem of waste management. Also, recycling is struggling to develop. The economic and fiscal incentives in this area are weak and inefficient.

The municipalities that we investigated (Tizi-ouzou, Draa-Ben-Khedda and Tirmatine) enrolled in an inter-municipal approach to the management of their waste. This original approach is driven by public authorities in the context of an integrated waste management. Here inter-municipalities relays primarily on the joint creation of a landfill center at the town of Draa-Ben-Khedda and a management agency for this center. It does not fit in territorial waste management logic. The sector based approach is not comprehensive.

In the following table, we present a comprehensive analysis of the average per capita cost of waste management. The municipalities having different size and means, management costs per habitant vary from one municipality to another. The reason is mainly due to the limited capacity of small municipalities and to their inability to manage the waste collection and transport service, despite the efforts of the relevant departments to streamline management.

**Tableau 1: Estimated cost of waste management for three municipalities.**

<b>Designation</b>	<b>Municipalities</b>	<b>Tizi-Ouzou</b>	<b>Draa-Ben-Khedda</b>	<b>Tirmatine</b>
<b>Total operating expenditure (DA)</b>		13 214 216	5 387 034	2 200 000
<b>Annual tonnage collected (Tons) averaged</b>		30 000	6 935	2 500
<b>Collection costs in DA / Tonne</b>		441,37	776,78	880,00
<b>Population (A.C.L)</b>		95 623	25 209	11 927
<b>Collection costs in DA / capita</b>		138,47	213,69	184,45
<b>By housing occupancy rate (T.O.L)</b>		6 persons	6 persons	6 persons
<b>Cost of collection / DA / household</b>		830,82	1 272,14	1 106,70

**Source:** sanitation and road services of the three municipalities and our classifications

Indeed, the cost is low in the town of Tizi-ouzou (DA 441.37 / ton) while it is relatively high in small towns in Draa-Ben-Khedda and Tirmatine.

Knowing that the amount of the local tax used to cover waste management costs are significantly lower than the actual costs incurred by municipalities. This charge known as

TEOM (Taxe d'Enlèvement des Ordres Ménagères /Removal tax of household waste) amounted in fact to 500 DA / household. This amount is set by the state administratively. Furthermore, the recovery poses a major challenge since a large part is not paid by households, while traders' taxpayers pay it in whole.

This difficulty of collecting the local tax and its low amount burden severely the budget of municipalities (Dorbane, 2004). In addition to the difficulty of the collection also raises the question of the amount of the concerned tax. **Furthermore, the flexibility of local governments is limited.** In fact, their role in setting the amount of the tax and their ability to recover it depend on the decision of the municipal assemblies. This process is hampered for cultural and political reasons elected person. This situation affects small towns for their waste management costs which are much higher, as noted in the table above.

Therefore, for a more rationality of the management of this service, it is necessary to streamline the costs management and the pooling of local resources in the inter municipalities context. In the following section, we will detail both suggestions.

#### **4. The need for rationalization of the local waste management strategy**

Local authorities in Algeria are facing major difficulties in the management of their waste. Several constraints were identified in our surveys. They are both linked to the inefficiency of instruments used, the mismatch between the resources mobilized and extent of waste to be managed, low culture of recycling and sustainable development at the consumer and producers level. The lack of qualified human resources and territorial engineering is also at the center of the difficulties of the municipalities. The constant and rapid evolution of waste discharge quantities in a high economic growth context forced the local authorities and often leads to enroll in daily management strategies (current), in lieu of a strategic vision (long term). Sector based approaches continue to dominate the action of the State (Dorbane, 2004). These are completely disconnected from the realities and territorial specificities of each municipality. Hence the need to move towards a territorial approach and decentralized waste management.

Inter-municipality thus represents a relevant scale for the development of an integrated territorial project on environmental management and not only wastes (Chenane, 2007). It is also necessary to streamline management costs. These are the two areas that we propose to improve the efficiency of Algerian environmental policies on household waste management in particular.

##### ***Inter-municipality, a relevant scale for integrated environmental management***

Inter-municipality on waste management is a necessity to ensure the continuity of the service and reduce the negative externalities (Bourjol, 1995). The achievement of controlled landfills often lays the localization problem for municipalities. Inter-municipality helps, in this sense, to reduce the number of landfills and encourages interaction and sharing of good practices. So the landfill site in the municipality of Draa-Ben-Khedda allowed municipalities members in the Inter-municipality to streamline the location of waste disposal site. The size of the site can also help to consider creating sustainable recycling companies. But the nature of the developed Inter-municipality remains fairly brief as this cooperation is limited to the creation of a common landfill site. This type of Inter-municipality management builds up a beginning which should be transformed quickly into an inter-municipal project. Environmental actions can thus be considered comprehensively and efficiently. The pooling of resources will also allow municipalities with limited means to benefit from additional human and material resources (Le Saout and *al.* 2004).

##### ***Rationalization of costs and recovery policy of local environmental taxes***

Clear definition of service standards (Flipo, 2001) and the correct calculation of the associated costs are necessary to improve waste management and minimize costs for municipalities. Underestimated costs are source of distortion. This directly affects the finances of local authorities.

Rationalization is required at the local tax collection dedicated to the financing of waste management policy. Uncollected taxes severely burden the budget of municipalities. It is therefore urgent so that the municipalities find effective way to collect taxes and streamline costs and expenses.

Rationalization of Costs and management standards are necessary in view of optimizing the operation of public operators and the gradual introduction of private actors. In other words, the integrated waste management must be rational in terms of cost control and environmentally sound.

## **5. Conclusion**

At the end of our study, we can argue that in Algeria waste management is facing multidimensional problems related to lack of financial, human and material resources of municipalities. This was confirmed by our surveys and our analysis of the case of local authorities (municipalities) of Tizi-Ouzou department. Household waste management costs are high while the local tax collection capacity is low. This creates a gap which greatly affects local finances and the sound management of waste costs. In addition, sector based policies implemented by the State through its decentralized agencies post modest results. In addition to their inefficiency, it should be noted the mismatch with the specificities and the territorial realities as diverse as large in Algerian local authorities.

In this context, we have proposed two possible ways to improve the effectiveness of current policies of household waste management in Algeria. In the first instance it comes to rationalize the management costs of waste management, and in the second instance, to drive on inter-municipal cooperation dynamics to pool resources (economies of scale) and enroll in a real territorial sustainable development project.

Furthermore, it is necessary to mobilize new resources and to expand the business of recycling and recovery of waste. The objective is to create a new market that can generate business and jobs.

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