

Deficits of Environmental Governance with Regard to Economic Intelligence: Case of the Controlled Landfill Project

Hamid Ait lemqeddem ^a, Siham Bouklata ^a, Abderahim Amam ^{a,*}

^a National School of Business and Management (ENCG), Kenitra, Morocco.

*Corresponding author email: amamabdo76mds@gmail.com

DOI: <https://doi.org/10.34256/ajir20238>

Received: 17-02-2020

Accepted: 21-09-2020



Abstract: The article attempts to make a contribution to overcome the existing deficits in environmental governance. The main objective is to identify performance indicators. By adopting a managerial approach, how can we overcome the deficits in territorial environmental governance? Economic intelligence is seen as a solution to existing deficits in this area.

Keywords: Environment, Landfills, Governance, Economic Intelligence, Project management.

1. Introduction

The prompt population growth and the severe shortage of resources likely to be devoted to urban development are the source of several environmental problems, especially those related to waste management. The severity of these issues is mainly due to the existing deficits in environmental governance. Local governance, also called “territorial governance”, marks a new vision of “territory” in economic, social, and ecological development. It refers to participative management of local development programs and projects. This, therefore, calls for new modes of network management, based on partnership and concerted action between several actors. In this context, the role played by inter-municipal cooperation, or inter-municipality, in the management of landfills represents a fundamental distribution of

local governance and the resolution of economic, social, and environmental problems. It represents an adequate form for studying the deficits of territorial environmental governance. A logical approach to support a new form of governance can be related to three phases (Cannistraro et al., 2015).

- To understand what long term thinking means for different organizations and what attitudes guided those organizations in facing long term issues.
- To analyze the relations between the type of organization, in terms of sector, size, funding, strategic role etc., and the long-term perspective they use.
- The study of problems that policymakers encounter in addressing long-term issues.

Effective environmental governance in the management of the environmental project of the landfill in terms of economic intelligence can be broken down into two distinct components: governance and economic intelligence. The governance component of the project relates to the entire interurban controlled landfill project, while the economic intelligence component deals with the project from a strategic and information management point of view.

In the light of local governance, the inter-municipality of the landfill paves the adequate way for the achievement of the following objectives: Firstly, management of the waste management service (from the production of waste to treatment and disposal); secondly, local development project, that of the inter-municipal landfill project and thirdly, ensuring sustainable environmental governance.

The economic benefits are: recycling, marketing, composting and funding for the waste management service (to help decision makers set a tax or contribution). On the social level, the benefit lies in organizing the situation of sorters by creating cooperatives. Finally, in environmental terms, the advantage is in greenhouse gases reduction and the treatment of leachate¹. The purpose of the inter-municipal landfill is to find an adequate solution in order to transfer the burden of managing landfills carried by Moroccan municipalities into a cost-effective integrated system. In fact, the landfill management system includes: Waste management cycle (Amasuomo,

Ebikapade & Baird, Jim, 2016); Actors in waste management (Ahsan, Amimul et al., 2014) and Means of waste management (Abarca-Guerrero et al., 2012).

The principles of effective environmental governance in the management of environmental projects in terms of economic intelligence can be summarized in the following elements:

- Monitoring

The corporate world is transforming faster than ever. Technology is moving rapidly, skills are getting archaic, and there is a serious need for training and re-training to stay relevant. It is then up to the L&D to design programs especially to encourage lifelong learning in the digital world (Valery Katkalo et al., 2019). The monitoring process includes all the information likely to have an impact on the environment. It is the process which consists in managing the critical information of the project (called CIP, hereafter) (Carroll et al., 2001). The monitoring process includes the following activities: Identify the needs of the CIP; Research and collect the CIP; Process and analyze the CIP; Watch the CIP; Disseminate the CIP to the project team and interpret, use, and make a decision (Perbal Séverine et al., 2009). The practice of the monitoring consists of three phases: Feasibility study phase; execution phase and project closure phase (Sadaf Hina & Panneer Selvam, Dhanapal Durai Dominic, 2018).

The security is applied on the entire information perimeter, the degree of security against breakdowns or intrusions and the potential for operational continuity (Spaey Dominique and Sofias Anastasio 2006). Further adding that the additional technical controls for physical and virtual threat restrictions are vital regulators of potential security threats.

¹ Leachate (or percolate) " is the residual liquid that comes from the percolation of water through a material ". This word comes from the Latin adjective *lixivius*, which means: "washing the liquid, water used for washing". This term notably designates all the "liquids" from landfills, waste, compost, etc.

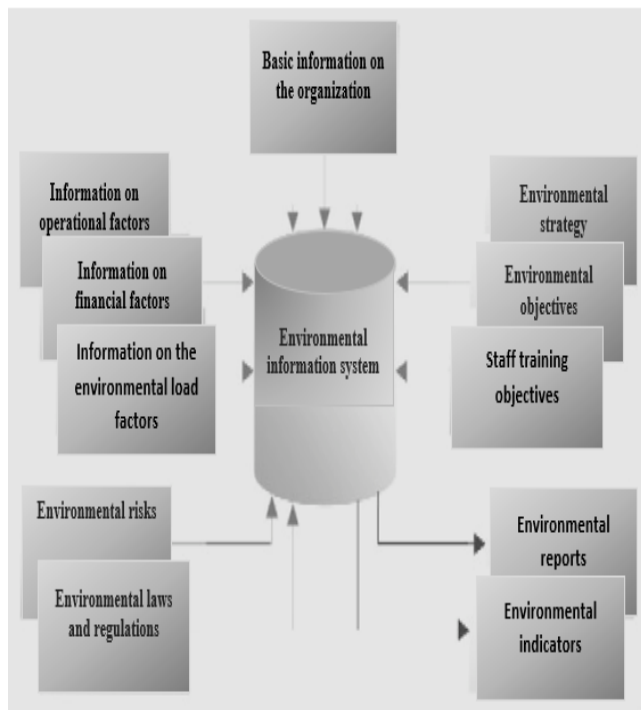


Figure 1 - Composition and operations likely to have an impact on the environment

Source: Perbal Séverine 2009

- Information Security

These regulators should be periodically upgraded for improved monitoring (Panneer Selvam, Dhanapal Durai Dominic, 2018).

- The influence of information

The influence of a business or a landfill project can manifest itself within it or in its relations with the outside world at each phase of its activity (Springuel Aubry, 2011). The practice of influence contributes to the constitution of one's own identity (Rindova et al., 2007), to the construction of sectorial standards (Abrahamson, Eric & Fombrun, Charles, 2007) and, also, to the timely focusing of public attention and its leaders (Ocasio, William & Joseph, John, 2005).

The work in process intends to emphasize the importance of an organizational territorial approach for the

actors' expertise and calling on all local potentials to contribute to sustainable local development in Moroccan territories. The study focuses on Economic and Strategic Intelligence as a solution to deficits in environmental governance. The main issue of our study will concentrate on the following question: **How can we overcome the deficits of territorial environmental governance?**

The foremost objective is to make an attempt in contributing to the fight launched against existing deficits in environmental governance, with the aim to finally propose new performance indicators at the end of the research.

To achieve this purpose, we will, first, expose and analyze the existing deficits in terms of territorial environmental governance; we will after attempt to show the role economic intelligence can play in overcoming the deficits in question.

2. Methodology

In order to conduct our research, we will try to adopt the managerial approach.

- Try to find new principles specific to environmental governance that will have to be implemented;
- Analyze the existing deficits and constraints that hinder the success of the Oum Azza controlled landfill project in Rabat, which represents an ideal practical case for the study of environmental governance;
- Present performance indicators.

3. Results and Discussions

1. Deficits in environmental governance: the case of the Oum Azza landfill

Oum Azza's controlled release project concerns thirteen municipalities (urban

municipalities: RABAT, SALE, TEMARA, SKHIRATE, HARHOURA, BOUKNADEL and rural municipalities: AIN ATTIG, SIDI YAHYA ZAERS, SEBBAH, MERS ELKHEIR, ELMENZEH, AIN AOUA, OUM AZZA) from the Rabat-Salé-Zemmour-Zaer Region (former division), they cooperated to set up a controlled landfill and three sorting centers.

Table 1. Methodological sheet of the research

Research approach	Qualitative
Location	OUM AZZA – RABAT Unloading discharge
Sample size	50 individuals: - the supervisory authority, - the Actors, the accountants and the general secretaries of the municipalities which are members of the intermunicipal association of the landfill, - the local population, - the private actors responsible for the management of the landfill, - sorting cooperative.
sample draw mode	Random
Data collection instrument	Interview guide
Method of administration of the questionnaire	face to face
Research period	from 01/01/13 to 04/01/13

Our own elaboration

These municipalities have entrusted delegated management to a private operator; TEODEM (subsidiary of the PIZZORNO group) by an agreement signed on February 13, 2007 for a period of 20 years. The choice of site was made in the rural commune of Oum Azza, 20 km from the city of Rabat. The results of the research are as follows:

Inter-municipal contribution from the Oum Azza landfill

- Rehabilitation of old landfills: This rehabilitation concerns the closure and rehabilitation of the old landfills of Akreuch, Oulja and Ain Attiq by replacing them with transfer centers in Akreuch in Rabat and the transfer center in Témara. We also add the creation of a leachate treatment station, as well as, the work concerning the transformation of the landfill site into green space. This positive and immediate impact is felt in the Bouregreg and Yqem wadis.

Waste recovery: The three recovery sectors concern sorting; agronomic recovery (composting) and energy recovery (CDM).

- Sorting: After the closure of the Akreuch site, at the end of 2007, informal waste pickers (rag pickers) in Akreuch, around 150 sorters, are grouped within the ATTAWAFOUK cooperative which marked a higher sorted material sales price than in the former Akreuch landfill (given the absence of intermediaries between sorters and wholesalers). Waste pickers benefited from CNSS benefits, rest, leave, etc.

- Agronomic recovery (composting): it concerns organic waste from the sorting operation, as well as green waste. These two types of waste must be composted to make a natural fertilizer. According to the survey carried out on the website, there is no composting operation.

- Energy recovery: It concerns the clean development mechanism project "CDM" which is a mechanism established by the international Kyoto protocol on the environment, which encourages developing countries to carry out projects of an economic, environmental and organization striving to reduce greenhouse gas (GHG) emissions. The delegate is awaiting

validation of the project by the CDM bodies; the start of the physical execution of the project will only take place after notification of the validation.

Effects of weaknesses in inter-municipal co-operation

Impact of the inter-municipal landfill on the Oum Azza territory

The inter-municipal discharge had an impact on the territory of Oum Azza in the following elements:

- Noise and Air: The sources of noise caused by the unloading of waste, the operation of the sorting chain and the operation of loaders. Air pollution illustrated by odors, gaseous emissions and dust.
- Surface and groundwater: it should be noted here that the external waters infiltrate into the waste and become leachate; therefore, the risk of pollution of the groundwater due to the fact that the ground water is only 10 to 15m.
- Fauna, Flora and Landscape: the development of specific animal species at the landfill; the proliferation of specific plant areas in the landfill and dumping of waste that affects the integrity of the landscape.
- Road traffic and risks: local residents on roadsides experience discomfort due to the passage of a certain number of vehicles and machinery, let alone the risk of garbage fire.
- Agriculture and animal husbandry: the value and the price of land have experienced a real depreciation.

Difficulties linked to legal, financial, organizational and human resources constraints

Several constraints disadvantage and prevent the municipalities from jointly

achieving their desired objective by the inter-municipal project of the landfill of Oum Azza. Generally, there are difficulties related to legal, financial, organizational and human constraints.

- Legal constraints

The text of the law of article 79 remained silent before the way in which the regrouping should be carried out, as well as for the party which will take the initiative of the creation. The failure to create a group of municipalities and in the absence of such a structure, there will be no grants, donations or assistance for large-scale projects. The text of the law should have been supplemented by a decree specifying who will take the initiative, especially when it is difficult to reach agreement (Ocasio, William & Joseph, John, 2005).²

- Financial constraints

It should be noted that the commune Oum Azza transports its waste free of charge; the town of Bouknadel does not transport its waste because of the significant distance which separates it from the site of Oum Azza. The other eleven municipalities have a significant amount of unpaid bills. The consequences of the accumulation of arrears on the quality of the delegation of the public service are: The inability to fulfill the commitments of the delegated company given the lack of cash flow resulting from the delays in payment by the municipalities; Delay in the payment of employees which leads to adjustments and strikes which affect the smooth running of work.

² The text of the law stipulates in article 79: "Urban and rural municipalities may form, among themselves or with other local authorities, groupings of municipalities or local authorities, for the realization of a joint work or for the management of a service of general interest of the grouping".

However, it should be noted that the delegated did not claim late payment interest for late payments.

- Organizational constraints

For transfer centers: The Akreuch transfer center also receives waste from Salé, it very often reaches saturation; bad odor resulting from the large quantities of waste which remain stored beyond 24 hours; not made available to the land delegatee as stipulated by the agreement due to strong opposition from civil society.

In terms of intelligence and control, the main difficulties to note are: the board of directors of the delegating authority has no headquarters; the absence of internal regulations fixing the methods of setting up and functioning of the intelligence committee; and, finally, the actual non-existence of an intelligence committee.

And in terms of information, it should be noted that there is a lack of information: Before the execution of the project, given the difficulties in finding a suitable place for the installation of the project, the population of Oum Azza was unaware of the installation of the landfill. For this, disguised information (the installation of a factory) was disseminated to install the project. After the execution of the project, the company does not communicate on the entirety of the reports of the board of directors, the minutes of the meetings of the general assembly as well as the reports of the statutory auditors.

- Human resources constraints

All the staff on the operating sites is 113 people, who remain insufficient. The delegate must designate an environmental compliance officer from among his employees, who must inform the delegating

authority of the conditions under which he performs his mission, the difficulties encountered, and the measures taken to remedy them.

- Other educational problems concern the absence of a specific and continuous awareness program on waste management for municipalities and the population in terms of environmental protection.

All these effects of weaknesses imply the urgency of applying adequate solutions to carry out this experiment.

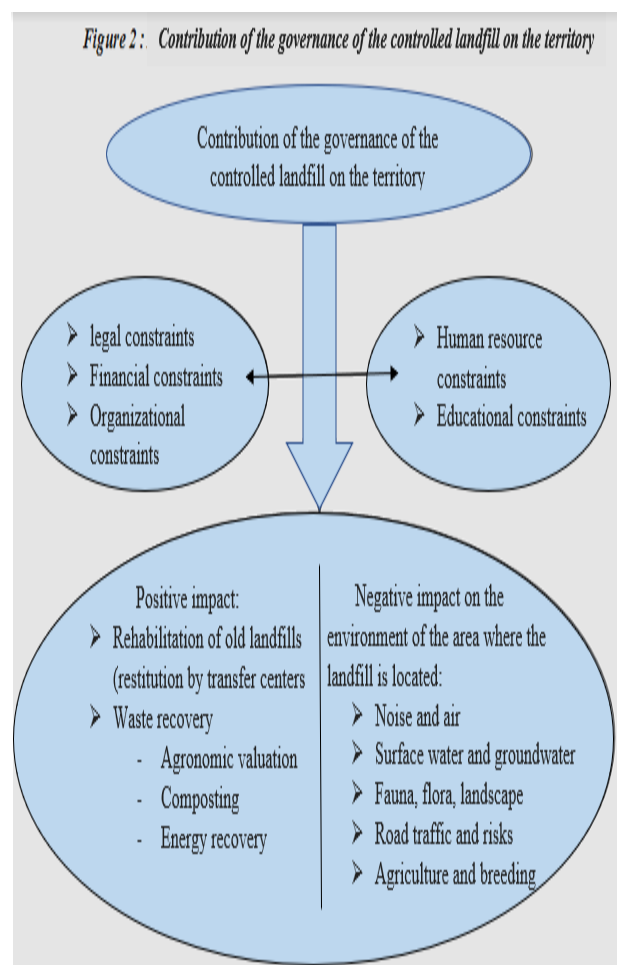


Fig 2. Contribution of the governance of the controlled landfill on the territory

Our own elaboration

2. The performance indicators proposed to fill the gaps in environmental governance: the case of a controlled landfill

The indicators proposed in this paragraph relate to the landfill management process from the point of view of environmental governance and economic intelligence.

Indicators for measuring environmental governance in the management of the landfill project

The landfill management system includes: the waste management cycle; waste management stakeholders and waste management resources. The proposed environmental governance measurement indicators are presented in the table below as follows:

Table 2. Indicators for measuring environmental governance

Grouping variables	Measuring Variables	Measuring indicators
Waste management cycle	<ul style="list-style-type: none"> - Production - Picking up - Treatment - Value 	<ul style="list-style-type: none"> - Quantity, - Cost, - Social optimum - Income.
Waste management stakeholders	<ul style="list-style-type: none"> - Municipalities - Population, - Private sector, - Associations, - Tutorship 	<ul style="list-style-type: none"> - Ethics - Responsibilities - Role in management - Correlation - Meeting and gathering -Personal activities -Group activities between stakeholders -Relations between stakeholders
Waste management means	<ul style="list-style-type: none"> - Landfill management methods - Management tools 	<ul style="list-style-type: none"> - The management regime - The organization of the project - Terms of reference - The legal framework - Management techniques adopted (from production to

		processing) - The means and tools used - The criteria for choosing a landfill - Funding.
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Our own elaboration

Indicators for measuring economic intelligence in the management of the landfill project

Monitoring process per phase

✓ Feasibility study phase

By focusing on the development objectives of the project, the proposed indicators are those relating to the existence of all the technical elements, energetic, environmental, and economic factors that guarantee the feasibility of the landfill project.

✓ Execution phase

This phase concerns the implementation of automatic surveillance. These are the indicators for surveillance the operating indicators of the landfill exposed in the 1st monitoring phase (feasibility of the project).

The purpose of measuring the indicators for these two monitoring phases is to establish the operating assessment for the landfill.

Four categories of evaluation will, thus, be established:

- A technical evaluation based on biological indicators, on the one hand, technical, on the other;
- An energy balance to assess the performance of the biogas recovery system;
- An environmental assessment in order to determine the impact of the operating unit of the controlled landfill in terms of reduction of greenhouse gases and energy efficiency;
- An economic evaluation to determine the profitability of the unit.

Table 3. Indicators for measuring economic intelligence in the management of the landfill project Our own elaboration

Grouping variables	Measuring Variables	Measuring indicators
Monitoring - Feasibility Phase	Technical	Elements of biological and technical feasibility
	Energy	Elements of feasibility of energy recovery
	Environmental	Environmental elements that do not prevent the feasibility of the project
	Economic	Elements of economic profitability
- Functioning phase	Technical	Biological and technical indicators
	Energy	Biogas recovery indicators
	Environmental	Environmental impact efficiency indicators
	Economic	Profitability indicators
Security	Information security	<ul style="list-style-type: none"> - Completeness of the scope of information - Degree of security against failures or intrusions - Potential for operational continuity.
Influence	Citizen results / clients	<ul style="list-style-type: none"> - Indicators concerning the overall image of intermunicipal cooperation - Indicators concerning participation. - The indicators concerning the accessibility of the public establishment - Indicators concerning the transparency of the processes.

- These reports will be used for the development of a "database" to support and optimize the management of the inter-municipal landfill project of Oum Azza.

✓ Project closing phase

It consists of capitalizing on critical project information (CIP) in order to be able to reuse it in future projects while mentioning the

process of the key success and failure project events.

The indicators proposed here are the weak or strong signals of the indicators; their objective is to understand and to mention the causes which gave rise to weak or strong signals of the environmental, social, and economic indicators.

Information security

The proposed indicators are: the completeness of the scope of the information; the degree of security against breakdowns or intrusions and the potential for operational continuity.

Information influence

The influence of the landfill project can manifest itself within it or in its relations with the outside world at each phase of its activity. The practice of influence is part of a self-evaluation process: consultation and advice from beneficiaries or partners are normally the basis of any development process, especially that the project is designed to be theirs at the end.

To measure results with citizens / clients, important indicators must be used:

- Indicators concerning the overall image of inter-municipal cooperation.
- Indicators concerning participation.
- Indicators concerning the accessibility of the public establishment.
- Indicators concerning the transparency of the processes.

- The indicators proposed here are the weak or strong signals of the indicators, they aim to understand and mention the causes which gave rise to weak or strong signals of the environmental, social and economic indicators.

These proposed indicators are used to assess environmental governance in terms of economic intelligence in the case of a controlled landfill before the implementation of the project, during its operation and also during its influence phase, because they can also be used to avoid the constraints and deficits of environmental governance.

Conclusion

Based on the principles of environmental governance and economic intelligence, we can say that the experience was only a response to emergencies (impact of the three illegal landfills, saturation of the Akreuch landfill, prospect of waste pickers after closure, etc.). The indicators proposed in this article shed light on the different facets of environmental governance deficits in the case of the Oum Azza controlled landfill and, no doubt, for other inter-municipal landfills in Morocco.

Accordingly, we deduce that the indicators proposed in this work can be divided into two components, an operational and a strategic one: the first operational component groups together the governance indicators linked to the waste management cycle, the stakeholders, and the means and tools used; and the second strategic component brings together indicators of economic intelligence linked to monitoring, security, and influence.

These indicators allow, for the action of public authorities, to have potential instruments to better manage local waste and also to reflect on an effective and efficient waste policy. They can be used to evaluate all waste management projects and can be a baseline for deriving global assessment indicators for all kinds of environmental projects.

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Funding: No funding was received for conducting this study.

Conflict of Interest: The authors have no conflicts of interest to declare that they are relevant to the content of this article.

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