



**TURIN
SCHOOL
OF LOCAL
REGULATION**

all policies are local

**YOTOCO TECHNICAL SANITARY LANDFILL
A REGIONAL SOLUTION FOR 12 CITIES IN
COLOMBIA – Case Study**

AUTHORS

Francesca Rosignoli

Bopha Youk

Claudia Ximena Ramos Hidalgo

Denis Parea

Patrick Ajuno Sesay

THE PROJECT



Data of the Yotoco Landfill	
Quantity of solid waste (Ton/day)	1712
Useful life (Years)	31
Type of final disposal	Regional solution
Authorization	Environmental License
Number of cities served (regional solution)	12
Source: SSPD, CRA	

Detail of investment costs of Yotoco Landfill	%	Euro	Year of application
PREFEASIBILITY STAGE	0,54%	24.215,81	2.015
FEASIBILITY STAGE	2,69%	120.202,94	2.015
CONSTRUCTION STAGE	96,77%	4.323.589,41	
Administrative Costs	2,70%	120.636,22	2.015
General Facilities	20,00%	893.601,63	2.015
Periodic investments (machinery, bulldozer, etc)	22,47%	1.003.961,43	Between 31 years
Property / land	7,10%	317.228,58	2015 y 2016
Stormwater management	2,10%	93.828,17	2.015
Leachate management	42,00%	1.876.563,42	2.015
Activities of the environmental plan in the construction stage	0,40%	17.872,03	2.015
Total cost of investments	100,00%	4.468.008,15	

Source: SSPD, CRA, calculations of the group

ECONOMIC REGULATION

Economies of scale are given largely by the lot of initial investment (sunk costs) and by the condition that costs operation of the landfill does not increase linearly with tons disposed.

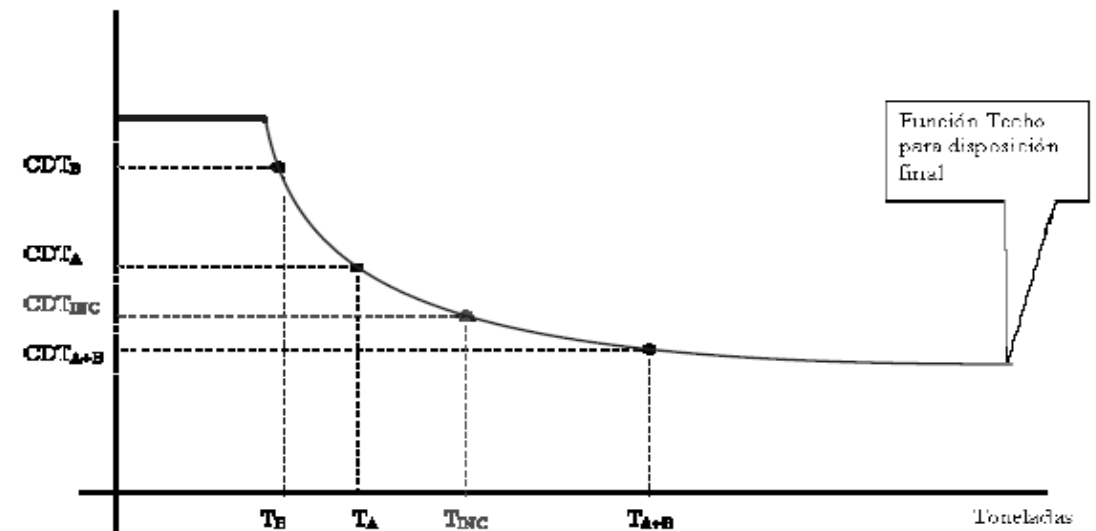
The equation obtained to calculate the cost of disposal in terms of tonnes disposed is:

$$\text{CDT}_j = \text{Min}[(11.910 + 104.519.468 / \text{T}_{Aj}), 50.890]$$

CDT_j = Cost of treatment and final disposal

T_{Aj} = Average of Ton per month adjusted by regionalization

The general methodology for cost evaluation is to calculate the average cost per ton, as the net present value of investments and expenses over the life useful and time post-closure of each type of landfill, divided by the value net present tons disposed during the life of the landfill.



REGULATION

- PGIRS (Solid Waste Management Integrated Plan)
- Technical Regulation
- Environmental Regulation
- Economic Regulation.

Permits calculate tariffs for every activity included (collection and transport, transfer, sweeping and cleaning, cutting grass and pruning of trees, recycling, treatment and final disposal).

SECTOR AND CONTEXT IN COLOMBIA

Law 142 of 1994

- Promote **free competition**
- Five values: Economic efficiency, financial sufficiency, neutrality, simplicity, solidarity and redistribution.
- Defines the conditions when an exclusive area can be given to a specific operator.

INSTITUTIONALITY

- Ministry of Housing, City and Territory (MVCT).
- National Planning Department (DNP).
- Commission Regulation of Drinking Water and Basic Sanitation (CRA).
- Superintendence of Public Services (SSPD).

LOCAL CONTEXT

Every municipality is responsible for developing the (PGIRS) and the local policies in consistent with national policies. If operators want to enter to the municipality to develop the public service, they have to execute it following the policies, parameters and goals of the PGIRS.

THE TARIFF AND FINANCIAL CALCULATIONS

Relevant results	Initial situation	Desired situation	Increment (%)
Revenue (Euro)	14'373.240	15'950.000	10,97
NVP	-10.555.220	7251	
Cost cap (Eu/Ton)	23	25.5	10,87
Tariff cap (Eu/subscriber)	1.87	2,07	10,7
Source: Calculations of the work group			

The change of revenue affects the unit price per ton of solid waste from 23€ to 25.5€. Due to the higher price the NPV changes from negative to positive and the increase of 2.5€ per ton does not imply a socioeconomic burden for customers. It implies a negotiation with the Regulatory Commission (CRA).

EQUITY, NEGOTIATION AND ENVIRONMENTAL ISSUES

EQUITY

- The Law assures solidarity and redistribution it means that the subscribers with higher incomes subsidize a percentage of the tariff of low-income subscribers.
- There is a participative mechanisms for a fair treatment and meaningful involvement of all citizens.

NEGOTIATION

- The geographical location of the landfill was negotiated with the 12 mayors.
- The tariff needs to be negotiated with the Regulatory Commission.

ENVIRONMENTAL

- Environmental license was negotiated with the environmental authority.
- it is mandatory for the landfill to obtain an environmental license in order to receive the incomes from the tariff.

INCENTIVES, PLAYERS AND RELATIONSHIPS

PLAYERS	RELATIONSHIPS	INCENTIVES
Subscribers / Population	<p>They pay the tariff (Not in my backyard).</p> <p>Subscribers prefer a landfill far but not to pay an additional cost in their bill due to longer distances.</p> <p>They play a double game</p>	Less tonnes, less costs.
Mayors	<p>Responsible for making the best decisions on behalf of the population.</p> <p>Relations with their neighbors.</p> <p>Pressure due to favors</p> <p>Good relations with population.</p> <p>Pressure from operators who want to enter to the city.</p>	<p>There is an incentive included in the tariff for the municipalities where the landfill is located. This is paid for the others municipalities that use the landfill.</p> <p>The mayors can use the incentive in projects about water and basic sanitation.</p>

INCENTIVES, PLAYERS AND RELATIONSHIPS

PLAYERS	RELATIONSHIPS	INCENTIVES
ANDESCO / Operators	National Association of Public Services Operators (ANDESCO). This association takes care of the economic interests of operators. Pressure on CRA and sometimes on the SSPD.	The tariff methodology recognized economic efficiency and financial sufficiency of the operators
Regulatory Commission	In some cases is possible that regulator capture happens and the rights of the subscribers may be violated.	They have the obligation to regulate with the rules of the Law 142 of 1994.
Superintendence of Public Services	In some cases is possible that SSPD capture happens and the rights of the subscribers may be violated.	They have the obligation to inspect, monitor, control, punish and fining with the rules of the Law 142 of 1994. Maybe they may be more encouraged to fining and punishing more in order to have more operating incomes.

CONCLUSIONS

Limits of the analysis

The analysis could be limited due to the following aspects:

- The work group did not have the exact value for some variables that maybe could change the results of the analysis.

Availability of data

- The financial calculation could be limited due to the lack of some variables like K_d , K_e , and tax rate.
- The cost of investment percentage financed by equity and by loan is an assumption. The working group unknown the real relation between equity and loan.

**THANKS FOR
YOUR
ATTENTION**

**TURIN
SCHOOL
OF LOCAL
REGULATION**

cies are loca

