



This project is co-funded by the European Union and the Republic of Turkey

Turkey Composts!

BIO-WASTE COLLECTION AND TREATMENT IN RURAL AND AGRICULTURAL SETTINGS

Buğday Association for Supporting Ecological Living

&

Association of Cities and Regions for Recycling and Sustainable Resource Management
(ACR+)

TurkeyComposts! Conference





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SUMMARY

- Rural and Agricultural Setting Properties
- Municipal Solid Bio-Waste
- Agricultural/livestock residues





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RURAL AND AGRICULTURAL SETTING

- Low population density (inhabitant/km²)
- Prevalent agricultural/livestock use



Great conditions to **locally** valorize bio-waste

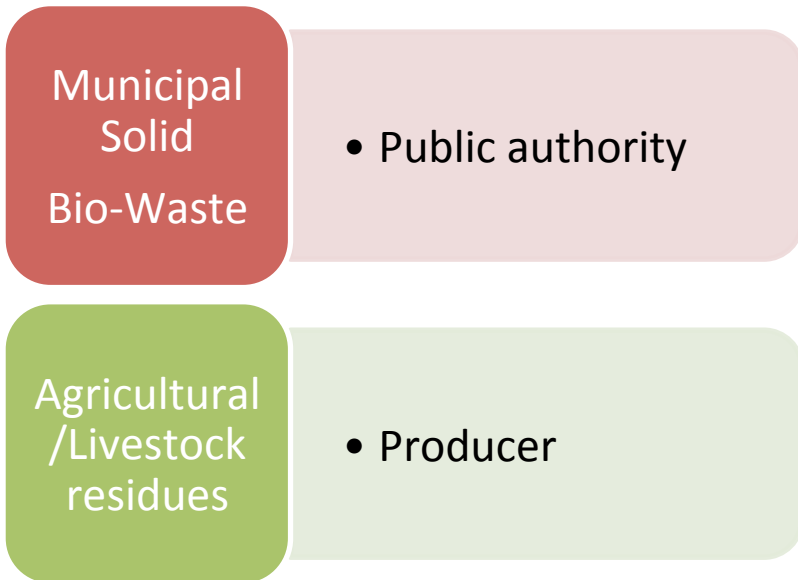




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RURAL AND AGRICULTURAL SETTING

Two main streams of organic residues





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ORGANIC MUNICIPAL SOLID WASTE TREATMENT



Home composting



Community composting



Small size plant





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ORGANIC MUNICIPAL SOLID WASTE TREATMENT



Home composting



Community composting



Small size plant

The case of Degache - Tunisia

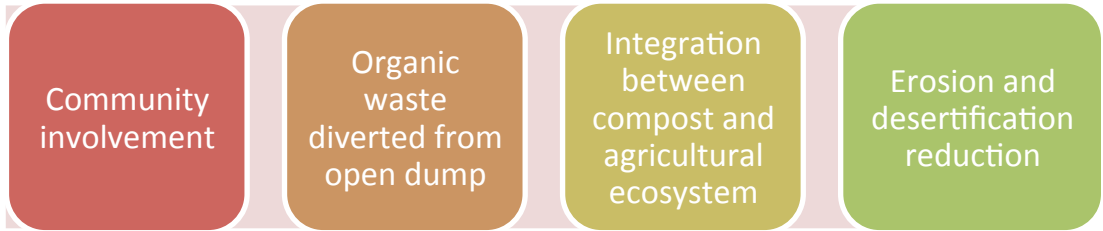




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BIOWASTE MANAGEMENT IN DEGACHE

Municipality of about 8.000 inhabitants, with **Palm Plantations**





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BIOWASTE MANAGEMENT IN DEGACHE

Start up in a neighborhood (1.000 inhabitants)



Photographs: E.R.I.C.A. soc. coop.





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BIOWASTE MANAGEMENT IN DEGACHE

Reorganization of the Door to Door **Collection System**

Collection frequency



- 4 times per week (**4/7**)

- 2 times per week (**2/7**)



Photograph: E.R.I.C.A. soc. coop.

Before it was **6/7** for unsorted waste



Now same resources but **source separation** of the wet and dry streams





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BIOWASTE MANAGEMENT IN DEGACHE

Small composting plant (100 t/y)



Photographs: E.R.I.C.A. soc. coop.





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BIOWASTE MANAGEMENT IN DEGACHE

Mix of the collected **organic waste** with **shredded palm leaves**



Photographs: E.R.I.C.A. soc. coop.





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BIOWASTE MANAGEMENT IN DEGACHE



1st Step (1 month) in the composters



2nd step (2 months) in covered windrows



Photographs: E.R.I.C.A. soc. coop.





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BIOWASTE MANAGEMENT IN DEGACHE



1st Step (1 month) in the composters



Main phases of the process





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BIOWASTE MANAGEMENT IN DEGACHE



1st Step (1 month) in the composters



2nd step (2 months) in covered windrows



Photographs: E.R.I.C.A. soc. coop.





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BIOWASTE MANAGEMENT IN DEGACHE



2nd step (2 months) in covered windrows



Photographs: E.R.I.C.A. soc. coop.

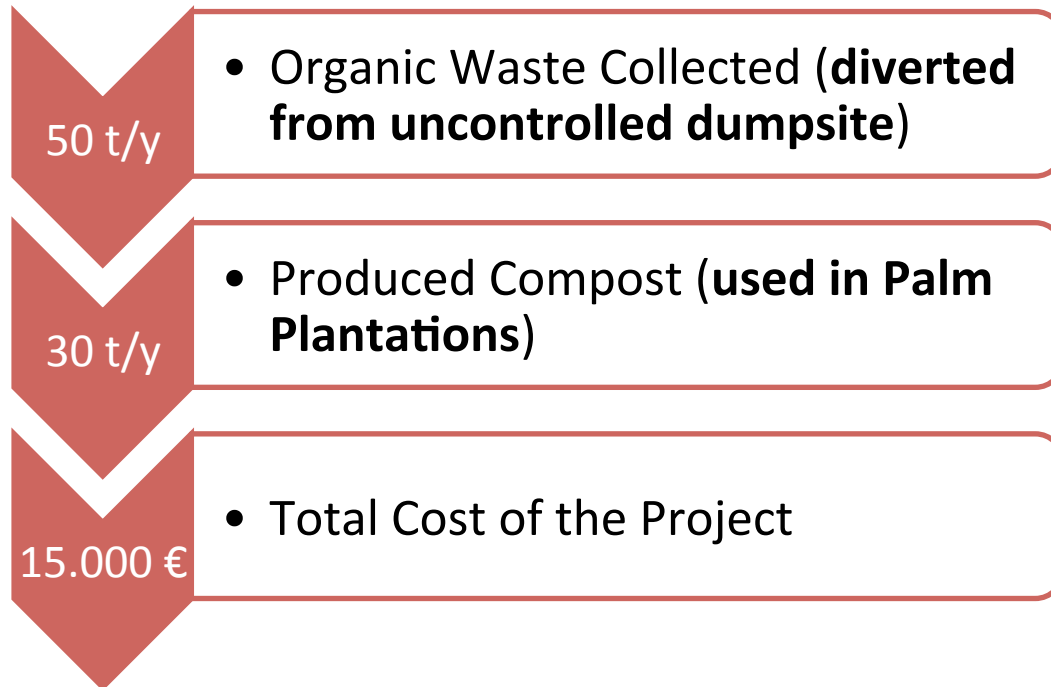




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BIOWASTE MANAGEMENT IN DEGACHE

Main Project results - 1st year



Replicate the model in other similar settings





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RURAL AND AGRICULTURAL SETTING -TREATMENT FACILITY -

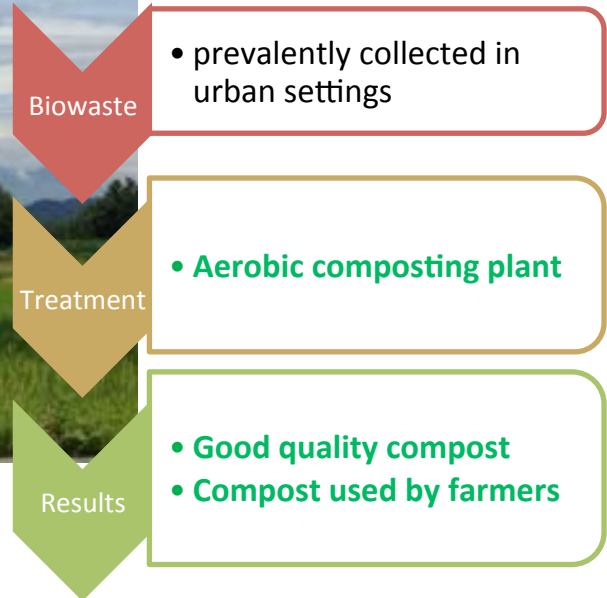
Santhià - ITALY



Photograph: E.R.I.C.A. soc. coop.

Photograph: thanks to ENTOSORGA ITALIA SPA

Facility visited by a Turkish Delegation on 16 th November 2016 («Turkey Composts!» Project)





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AGRICULTURAL/LIVESTOCK RESIDUES





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AGRICULTURAL/LIVESTOCK RESIDUES

According to the *Needs Analysis Report*:

Turkey is a country with high agricultural and livestock production capacity

Plant residues

- Usually burned

Animal manure

- **partially used in the fields in raw form**
- the rest is just left for **uncontrolled decomposition**



- Nuisances for the community (odors,..)
- GHG emissions (climate change)
- Water pollution (e.g. using manure in raw form)
- Loss of nutrients (low resource efficiency..)

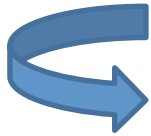




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AGRICULTURAL/LIVESTOCK RESIDUES

Manure is potentially a **precious resource** as fertilizer or soil conditioner



It needs to be managed adequately



fitting the objectives within the context of the farm and considering local conditions

Some number:

- 20 tons/year → average manure production of a single cow





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AGRICULTURAL/LIVESTOCK RESIDUES

Manure is a problem to be managed for a lot of farmers..



..also because many of them do not grow the food for their animals themselves anymore





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AGRICULTURAL/LIVESTOCK RESIDUES

If the manure is not properly managed..



I
M
P
A
C
T
S

AIR

- ammonia (NH₃), nitrous oxide (N₂O) and methane (CH₄)

WATER

- nitrates (NO₃⁻), phosphates (PO₄³⁻) and organic matter

SOIL

- phosphates (PO₄³⁻) and heavy metals

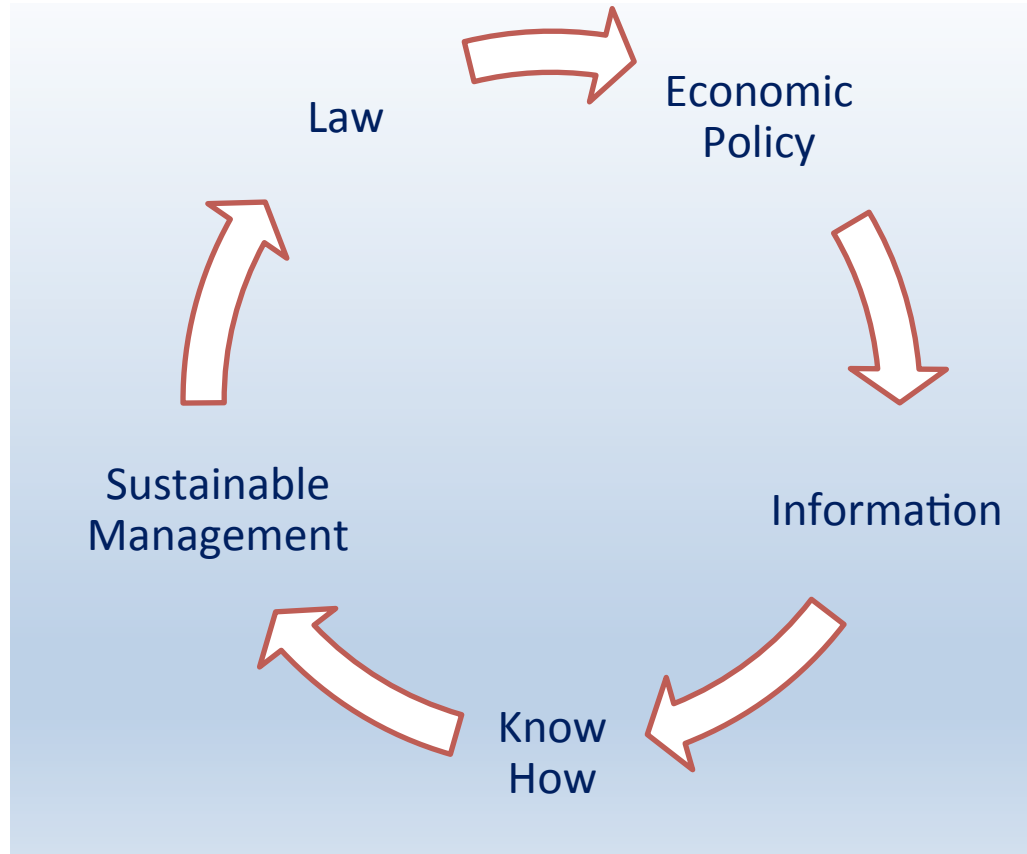




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AGRICULTURAL/LIVESTOCK RESIDUES

A **complete framework** is important



But it is also important to chose the **most feasible** and **long term sustainable solution**

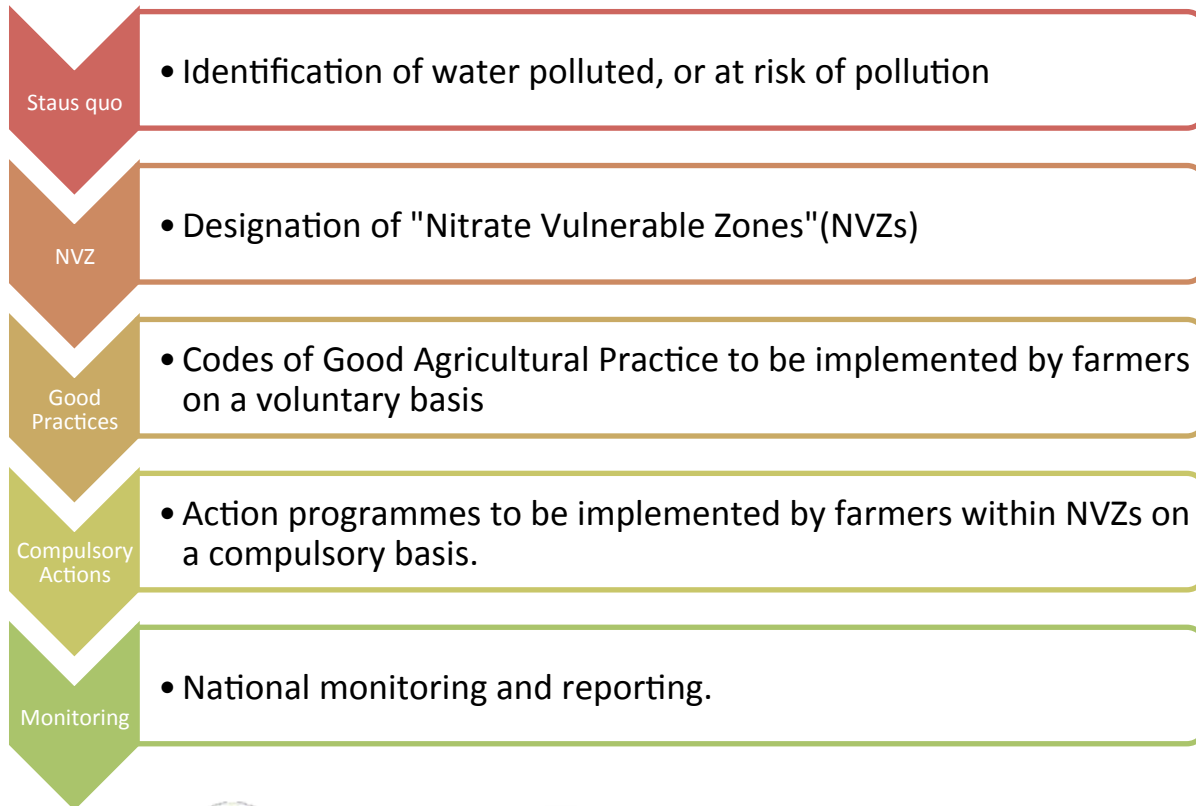




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EU EXPERIENCE

The Nitrates Directive (1991) aims to protect water quality across Europe by preventing nitrates from agricultural sources polluting ground and surface waters and by promoting the use of good farming practices.

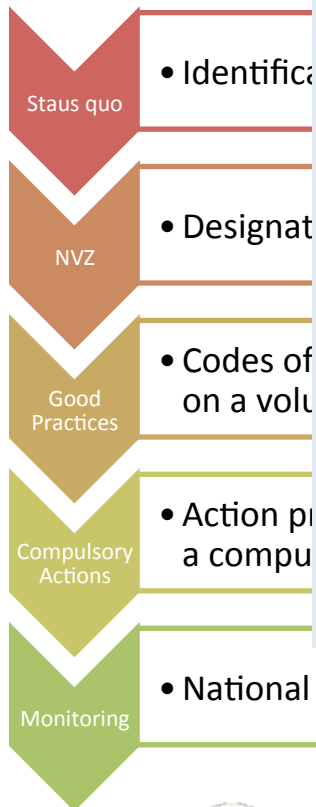




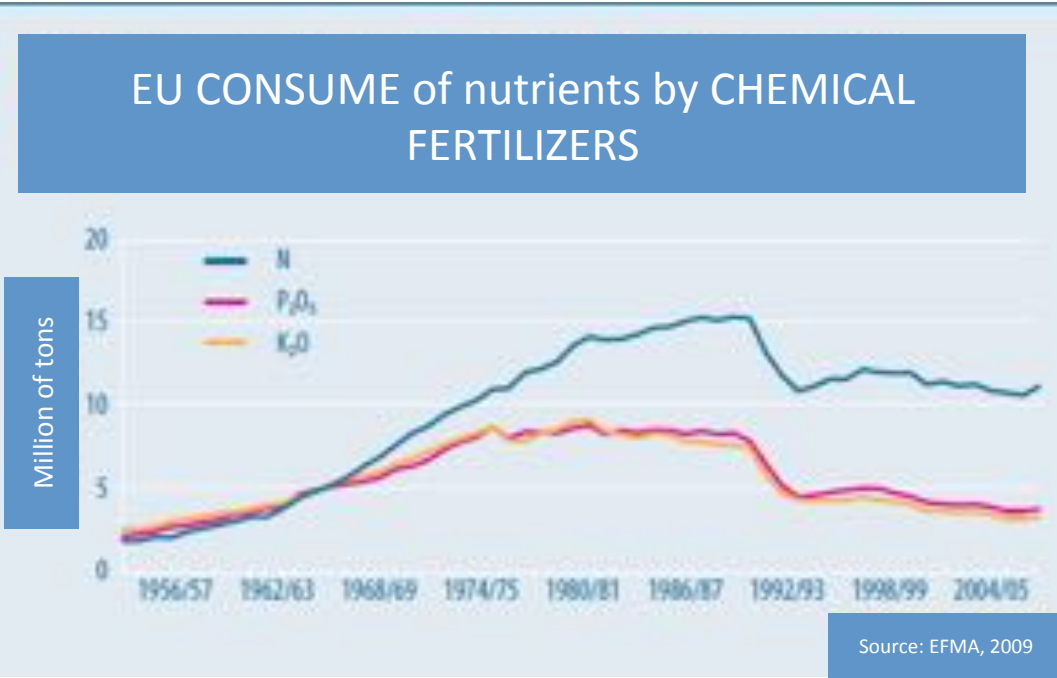
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EU EXPERIENCE

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- Identification
- Designation
- Codes of on a volu
- Action p a compu
- National monitoring and reporting.





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MANURE MANAGEMENT DESIGNING

Field crops

- Availability of accessible field crops to be fertilized
- Nutritional requirements and productivity of the field crops
- Presence of other competitive/synergic organic fertilizers in the area

Farm

- Density and intensity of farming
- Livestock typology
- Economic profile

Context

- Climatic factors
- National or local regulation constraints
- Energy Prices
- Distances and transportation costs

Factors to be considered





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MANURE MANAGEMENT DESIGNING

Product

- Reduction of transport cost by reducing the manure/slurry volume
- Transformation of manure into valuable products
- Adjustment of manure production and composition to the agricultural demand

Nutrients

- Nutrients recovery
- Nitrogen removal
- Removal of easily biodegradable organic matter

Environment

- Decreasing gaseous emissions (ammonia, methane and nitrous oxide) caused during manure management and storage
- Prevention of nitrates pollution due to run-off or leaching
- Sanitation
- Production of renewable energy

Treatment Strategy Objectives





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MANURE MANAGEMENT DESIGNING



Solid /Liquid separation techniques



Anaerobic treatment



Composting



Treatment of the liquid fraction (Phytodepuration)



Air cleaning (biofilter)

Some Treatment typologies





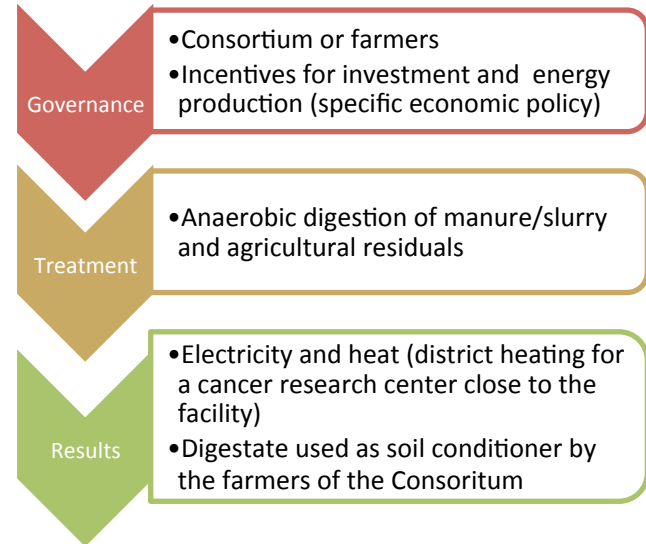
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ANAEROBIC DIGESTION - SUCCESSFUL EU CASE -



Photograph: thanks to COOPERATIVA LA SPERANZA

Candiolo - ITALY





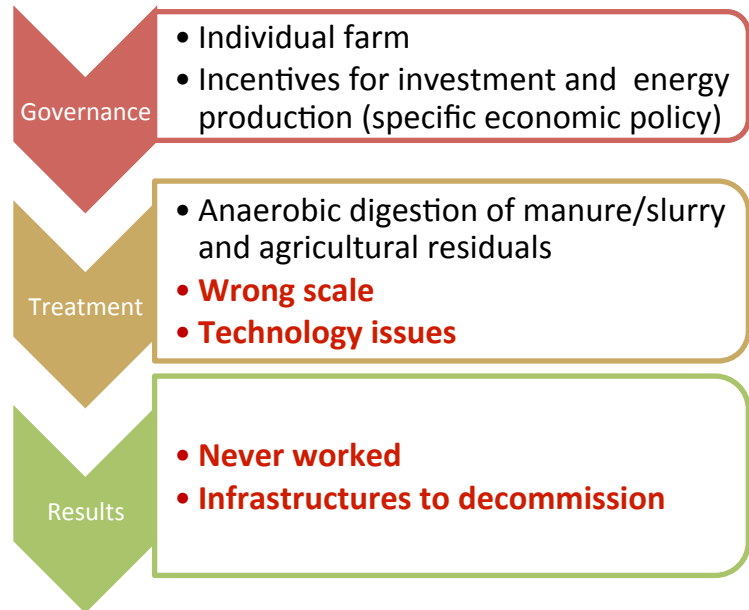
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ANAEROBIC DIGESTION - UNSUCCESSFUL EU CASE -



Source: Elaboration of a Google Earth Image

Poirino - ITALY



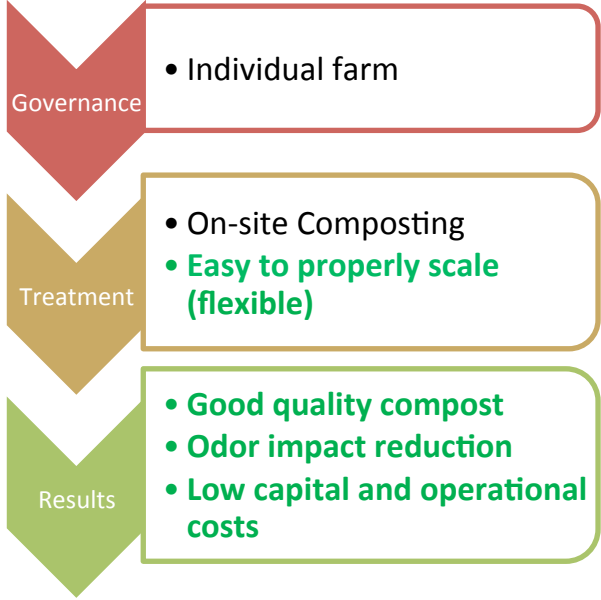


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COMPOSTING - EU CASE -



Juncosa - SPAIN



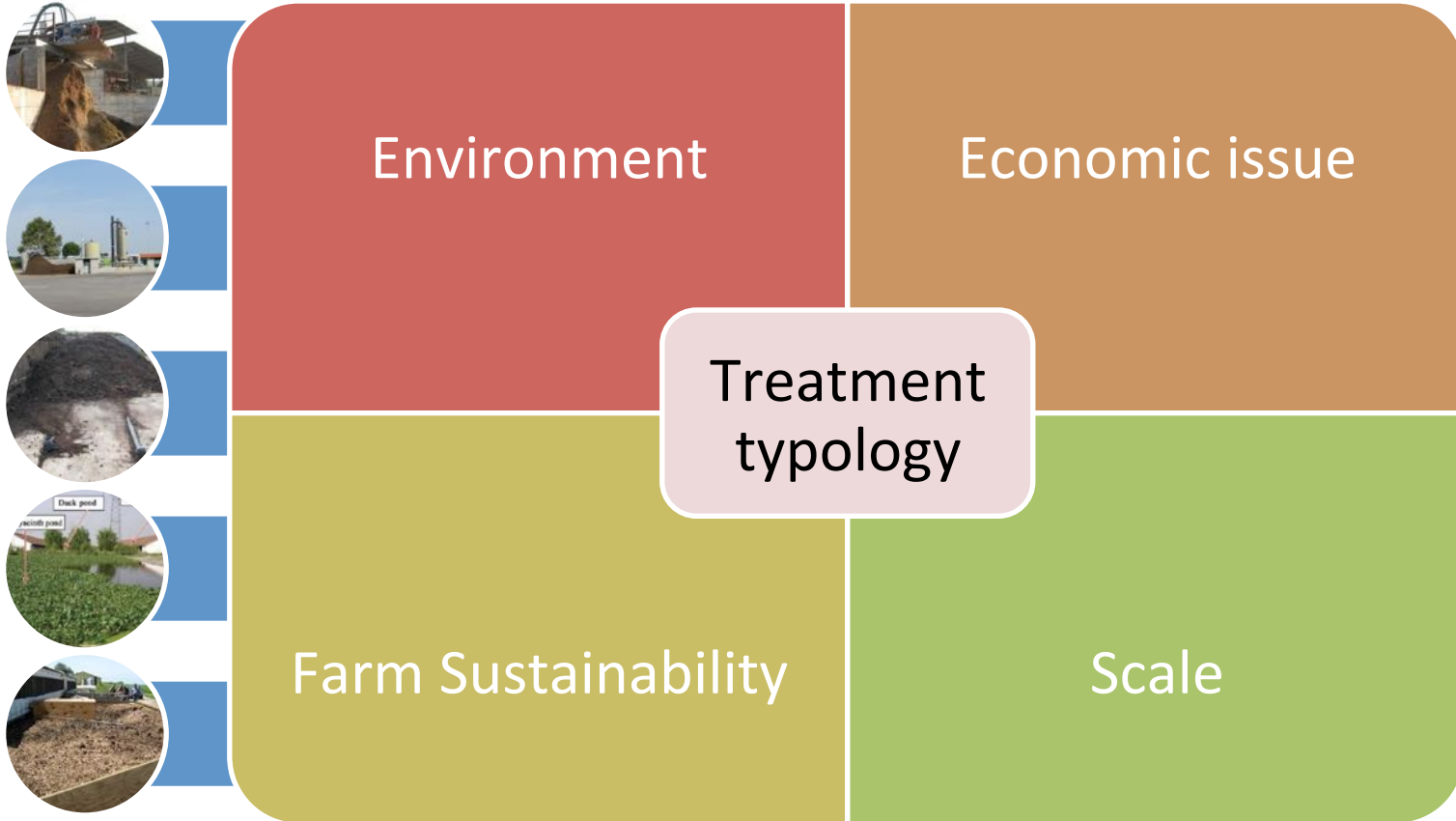
SOURCE: Technical Report No. II to the European Commission, Directorate-General Environment concerning Manure Processing Activities in Europe - Project reference: ENV.B.1/ETU/2010/0007





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MANURE MANAGEMENT DESIGNING





THANK YOU VERY MUCH FOR YOUR ATTENTION

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