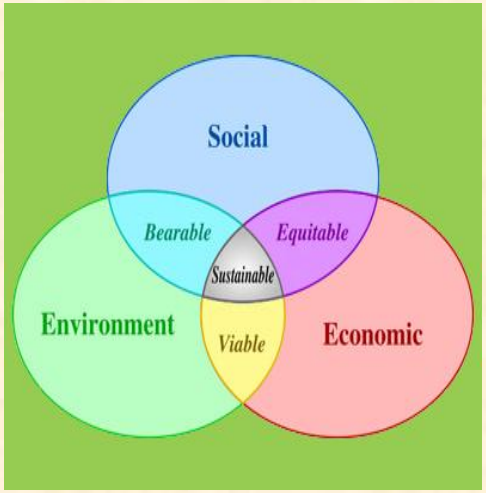
Economic Benefits

- The composting system that has been designed and manufacture is a low cost system that can be used to treat waste
- The system provides a controlled and fast composting method with better quality and higher quantity end product in comparison to other composting systems (e.g. windrow composting, aerated static pile composting) thus making it more profitable
- A product with high added value is produced, by transforming a waste into a useful high quality end-product good enough to be marketed.
- The potential substitution of the synthetic fertilizers used for agricultural purposes by compost leads to saving of cost for raw materials and energy.
- Small or medium size isolated areas can use the decentralized system for the treatment of the organic fraction of municipal waste and other BOW and sludge in a much more cost-effective manner than transporting waste to long distance centralized facilities
- Individuals that produce BOW can use the system developed to produce a high quality product with economic interest–added value.
- Farmers in the long term and especially those that employ organic farming can benefit financially from the use of compost that originates from BOW



LIFE 3rd Countries—WasteSUM

Environmental Benefits

- Reduction of the amount of untreated sludge that is disposed
- Diversion of BOW from landfills, contributing to the reduction of green house gases and extension of current landfill longevity
- Raising environmental public awareness
- Reuse and conservation of valuable biosolids-borne constituents through land application of compost
- Production of a material with added value that could be used on land as soil fertilizer, soil improvement and soil conditioner
- Replacement or reduction of the use of synthetic fertilizers for agricultural purposes and thus reduction of nitrate contamination
- The proposed composting technology has the potential to treat a range of waste streams reducing the environmental impacts from their disposal.

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MOROCOMP

LIFE 3rd Countries

LIFE 05/TCY/MA/000141

Design and Application of an Innovative Composting Unit for the Effective Treatment of Sludge and other Biodegradable Organic Waste in Morocco,

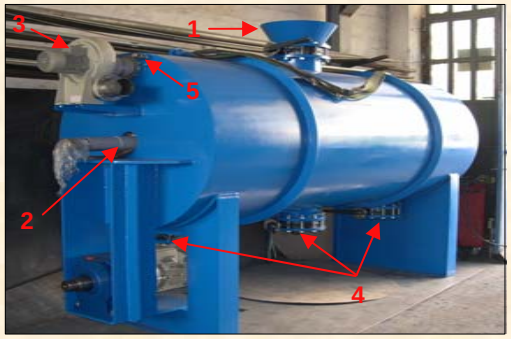
composting MOROCOMP

Faculty of Sciences of El Jadida (UCD)

Regional Office of Agricultural Development (ORMVAD)

National Technical University of Athens (NTUA)

In –vessel composting system



1. The supply portal is a circular 12-inch diameter opening attached at the upper part of the bioreactor and it is used to feed the raw material into the bioreactor.

2. The agitation system comprises of a steel revolving axis which runs along the bioreactor chamber. The axis carries steel blades are distributed along its length. The design and the arrangement of the blades were performed in such a way as to provide a uniform agitation of the substrate and preventing the substrate to aggregate

3. Air sanction system: The fan sucks air from the bioreactor's interior and blows it outside to the biofilter (deodorization of the air), while at the same time, fresh air is introduced inside the bioreactor after it has first passed through a filter.

4.The removal and collection of compost is taking place diametrically opposite to the supply portal. Three circular openings were constructed one in the centre and one on either side of the central portal. Leachate is removed from the bioreactor through an appropriate piping system located at each removal portal.

5. Hydration system: Water is distributed inside the bioreactor chamber through a pipe installed at the top part of the bioreactor and runs internally through the whole length of the bioreactor

System characteristics

Feedstock material

Material used during the program

- primary sewage sludge from the city of El Jadida,
- sugar beet leaves,
- straw residues,
- sheep and cow manures

The bioreactor can receive and treat any other organic waste

Capacity:

- The bioreactor has a volume of approximately 4 m^3 and a workable initial volume of 2.4 m^3 (60% of the total volume).
- The capacity of the system can be adjusted according to the quantity of sludge and BOW to be treated by constructing parallel composting systems
- For a tonne of treated waste the compost produced is within the range of 200 to 250 kg depending on the characteristics of the feedstock material.

Retention Time:

- The time needed for a full composting trial ranges from 25-30 days (minimum time is due to optimisation of the bioreactor operation for specific feedstock material and ratios)
- The retention time can be reduced if the maturation phase takes place outside the bioreactor

End product — compost

- Absence of phytotoxic compounds
- Enhances plant growth and seed germination
- High level of nutrients (NPK value)
- Low concentration of heavy metals
- Absence of potential pathogenic micro-organisms

Compost applications

- Agriculture
- Reclamation/Erosion control,
- Landscape
- Turf grass/ Home gardens,
- Landfill cover,
- Bio-filtering
- Rainwater filters
- Greenhouses

Benefits of compost application

Reduced need for inorganic fertilizers

Composts act as slow-release fertilizers for nitrogen and phosphate, and provide a readily available source of potash. And it also provides other nutrients such as magnesium, sulphur and trace elements.

Reduced nutrient leaching

Compost raises the Cation Exchange Capacity (CEC) of light textured soils this enables the soil to hold onto nutrients such as potassium and nitrogen, which would otherwise leach beyond rooting depth.

Increased yielding potential

Compost is able to provide organic matter in a relatively stable form that can raise the soil organic matter levels resulting in improved yields and cost savings

Better soil structure leading to - greater workability of soil and - increased traffic tolerance

The organic matter improves the aggregate strength of soils this means that the soil is more resistant to compaction and that roots can penetrate more easily to find nutrients and water. The workability and traffic tolerance of the soil is also improved so that the use of large, modern machinery results in less soil compaction and the soil can tolerate the use of vehicles and equipment on more days per year.

Improved water holding capacity

As part of the benefit of improved soil structure, the infiltration of rainfall and irrigation water is improved and the soil water holding capacity is increased especially on light textured soils. Thus the frequency and duration of irrigations can be reduced leading to lower water consumption.

Reduced erosion risk

In areas where organic matter levels are low and soil aggregation poor the erosion risk is higher. Compost can rectify the situation and spot applications can be used to reduce erosion in susceptible areas of a field.

Plant disease suppression

Soil borne plant pathogens may be suppressed in soil when suitable microorganism species are introduced into the soil in appropriately prepared composts. This suppression may be caused by a combination of factors such as competition, antibiosis, parasitism or induced systemic resistance.