FEEDING THE SOIL AND COASTAL ECOSSYSTEM RESTORATION: CONVERTING WASTE INTO VALUE

WASTE MANAGEMENT AND DEFORESTATION: TWO OF THE BIGGEST CHALLENGES IN BRAZIL

Proper waste management is a worldwide challenge specially in low-income countries, as it requires substantial investments in physical infrastructure and long-term operations. In 2020 almost 40% of the waste produced in the country was open dumped or disposed of irregularly, and more than 60% of waste that had proper disposal was sent to landfills, showing that this is still the main destination for solid wastes. It is urgent and mandatory to promote initiatives that creates opportunities to increase the value incorporated in waste, taking advantage of it's potential before reaching landfills.

In this context, the Açu Port Administration launched the Circular Economy Project – **FEEDING THE SOIL FOR COASTAL ECOSYSTEM RESTAURATION: CONVERTING WASTE INTO VALUE**. The project aims to provide better and more adequate destination to organic waste generated at port's operations, producing organic compost used to restore coastal ecosystem vegetation around the port area.

Compost is organic material that can be added to soil to help plants grow. Food scraps and yard waste together currently make up more than 30 percent of what we throw away and could be composted instead. Making compost keeps these materials out of landfills where they take up space and release methane, a potent greenhouse gas.

Until the middle of 2019, when the project was initiated, all the organic waste generated by the port administration was disposed in landfills. Now, 100% of the waste is recycled and used as fertilizer to restore coastal vegetation. In addition to eliminate waste disposal in landfills, the project also contributes to tackle country's main environmental challenge: deforestation.

The project materializes our commitment to save natural resources, preserve environmental quality and biodiversity, in addition to reduce GHG emissions, fomenting port's circular economy and contributing to achieving UN's SDGs. It also demonstrates Port Administration leadership in facilitating sustainable waste management that can result into cost savings opportunities and increase port's ESG overall performance. The initial results show that the project has great potential to be replicated by other ports worldwide

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THE PROJECT

The project aims to provide beneficial use for the organic waste generated at the port. It includes a **Treatment Plant** to receive and treat organic waste originated from all port activities.

With 70m², the Treatment Plant holds all the **control measures necessary for environmental impacts prevention:** shelter to avoid rainwater contact, impermeable floor and draining system to collect and recirculate leachate.

Operation is designed to prevent bad odors and attraction of unwanted insects and animals.

The Treatment Plant has a process capacity of 50 tons of organic waste per year, producing up to **7 tons of organic compost** that are used to restore the vegetation around the port area.

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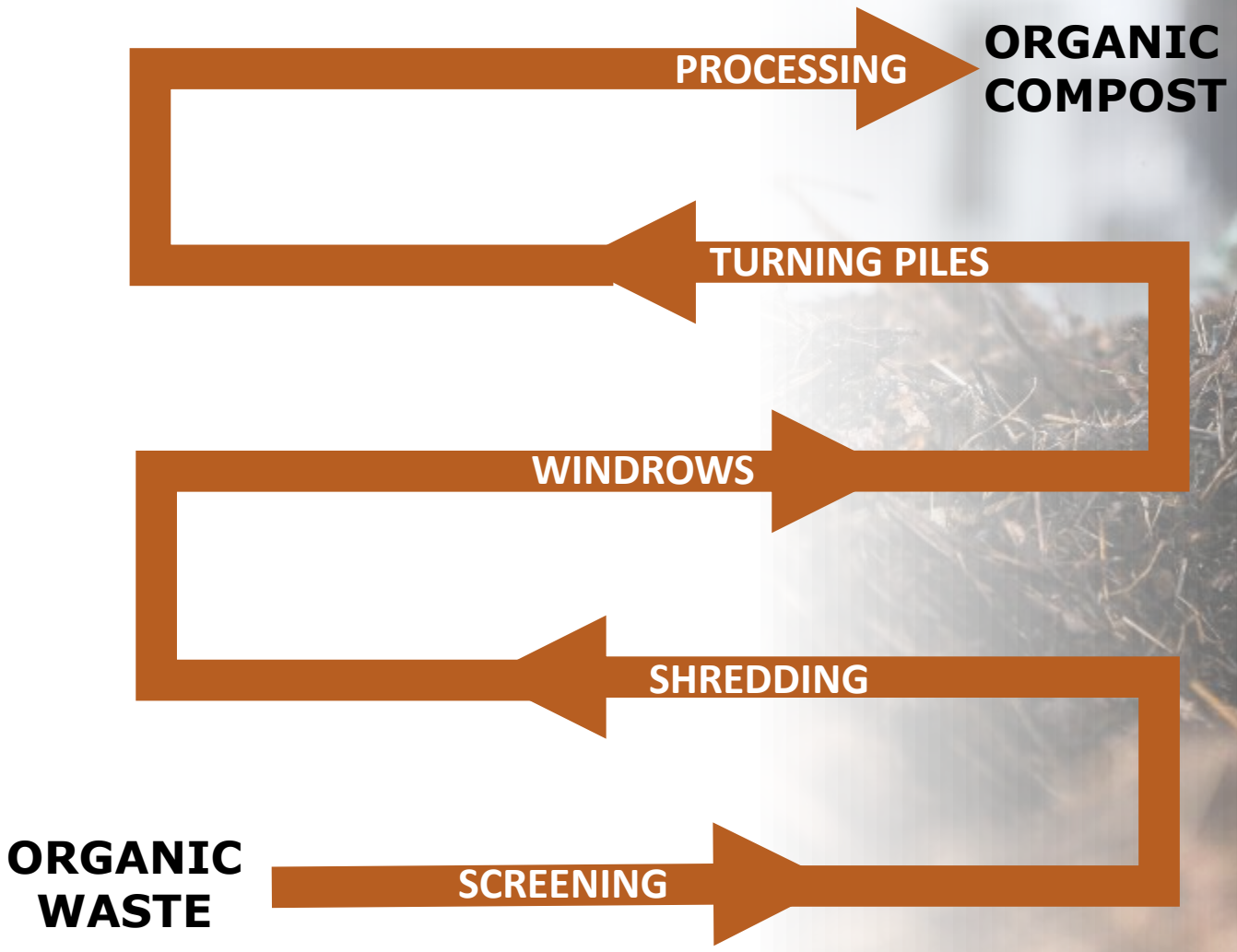
THE COMPOSTING PROCESS



Aerating or turning windrow composting: the organic waste, after screening and shredding, is disposed into rows of long piles (windrows) and manually turned to promote aeration and temperature control. The biodegradation step (processing) takes from 60 to 120 days when the physical parameters are monitored and controlled to guarantee the formation of an organic compost.

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Using waste to restore coastal vegetation

All the organic compost produced is used at the Natural Reserve Caruara's seedling nursery and in restoration projects.

The demand for organic compost is over 250 tons per year, which shows great **opportunity for expansion**.

Seedling nursery dedicated to restinga with annual production of **200.000 seedlings** of **88 species**

Restoration of over **1.200 ha**

Caruara's Private Natural Heritage Reserve

40 km² of protected area dedicated to restore coastal ecosystem.

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SUPPORTING RESTORATION OF ONE OF THE MOST THREATENED BIOMES

The Atlantic Forest is the 5th most threatened biome in the world. Today, the remaining fragments cover about 15% of the original area.

Restinga, which is coastal vegetation associated with the biome Atlantic Forest, is one of the most fragmented and threatened ecosystems in the country.

Caruara is the **largest private reserve** dedicated to the protection of *restinga* ecosystem in Brazil**.**

Recovering restinga contributes to the national goal to restore 12 million hectares of forests by 2030, aligned with the UN Decade on Ecosystem Restoration. Contributing, therefore, to a national and global challenge.

Composting creates a nutrient rich soil amendment that supports the seedlings development and restauration activities.

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FEASIBILITY STUDY
THE PILOT PROJECT RESULTS

To proceed with the project, a **scientific research project** was structured aiming to test the **composting methodology**, **assess necessary infrastructure**, calculate **resources** and inputs to operations and to **evaluate the quality of the organic compost produced**.

The pilot project was in place from August 2019 until December 2020, composting all the organic waste generated by the port administration's direct activities*.

The **pilot was proved efficient** and after the trial period it was started the environmental licensing process to obtain the permits necessary to start treating organic waste from other port terminals, to **amplify project's capacity and enhance Port's waste management**.

*Port administration and Multicargo Terminal operations (dry bulk)

HIGH QUALITY ORGANIC COMPOST

- ✓ Chemical analysis comparing the compost produced at the composting pilot plant and a conventional one, shows similar **macro and micro nutrients availability**.
- ✓ Local soil lab analysis demonstrates that the produced organic compost supplies most of the nutritional demands, therefore **reducing the need for chemical fertilizers**.
- ✓ The organic compost produced **reduces the need for irrigation** since it promotes better water retention.
- ✓ Biometric parameters follow up attested **good plant development**.

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Since August 2019...

- 19 tons of organic waste recycled
- Savings in organic compost aquisition and waste treatment and transportation
- Production of 1.5 tons of organic compost
- Reduction of Green House Gases Emissions from logistics and landfill disposal

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CONCLUSIONS

As a large port-industry Complex, waste management is one of the main challenges to face, ranked 8 in ESPO Top 10 environmental priorities of European ports for 2020. Improve waste management by fomenting better disposal ways contributes to enhance environmental and economic results, since it promotes a more suitable and efficient manner of taking the wastes' potential value.

Composting is an initiative that materializes our commitment to saving natural resources, preserving environmental quality and biodiversity, in addition to reducing GHG emissions, contributing to UN's SDGs.

Project demonstrates the Port Administration leadership in facilitating sustainable waste management that can result into tenants cost savings opportunities and increase port's ESG overall performance.

The project and its initial results shows great potential to be replicated by other ports worldwide. At Port of Açu we will continue our work to amplify the organic waste processing facility capacity to attend the whole port's operations as well as seek for new and innovative ways to deal with the waste generated at port.

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