

Conversion of urban wasteland into fertile grassland through regenerative agro-agriculture in Sestao

This initiative to recover wasteland and degraded space in the municipality of Sestao has been promoted by the Town Council and the public company Sestao Berri.

The test plot, which was in a highly degraded state, is located next to the Sestao Blast Furnace and the former Arcelor Mittal facilities. The aim of the intervention was to test the effectiveness of innovative and low-cost soil reclamation, composting and seeding techniques, and regenerative livestock principles for grassland management. To this end, the different solutions implemented have been analysed in terms of their capacity to convert wasteland into productive grassland with good soil quality, and their potential to maximise climatic ecosystem services such as carbon sequestration and improved permeability.

The intervention also tested urban grassland management solutions such as regenerative grazing, which produces significantly less emissions than conventional park maintenance and guarantees better soil quality.



Location of the plot to be recovered next to the Sestao Blast Furnace (Basque Cultural Heritage).

Phases of the work to RENATURALISE THE OPPORTUNITY SPACE

PHASE 1: Site preparation

Clearing and levelling work on a vacant plot of land of **14,580 m²**. The surface was almost devoid of soil, aside from sparse material that has settled over the years on an old concrete slab. Work was carried out to adapt the texture and relief of the plot, re-profiling the land, adapting the slopes to improve drainage, and providing 30 cm of fill material (nutrient free) of suitable grain size.



Appearance of the plot before the intervention.



Appearance of the plot after clearing and levelling the land.

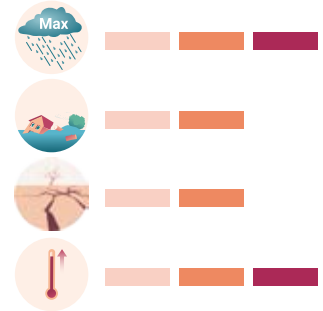
PHASE 2: Conditioning of the physical and chemical properties of the soil

Work was performed to amend the organic nature of the soil using compost from the organic fraction of MSW treated at the Artigas landfill to improve soil quality and develop fertile grassland. Mycorrhizal treatment was also applied.



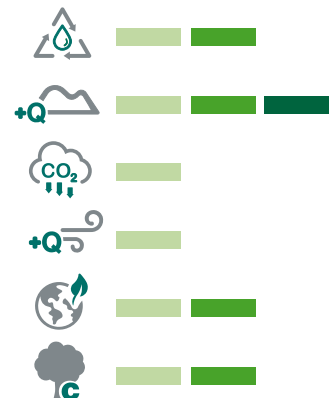
Compost heaps before and after application.

CLIMATE THREATS



CO-BENEFITS

Environmental



Social



Economic



SDG



PHASE 3:

Vegetation conditioning and weed control

Seeds were sown to recover the native grasslands and develop biodiversity. The plot was divided into 8 tesserae, differentiated by the amount of compost used, whether mycorrhizae was applied or not, and whether conventional commercial grassland or native honey meadow were sowed, using seeds of **40 types of flowers** and **4 types of grasses** at a **proportion of 60% and 30%**, respectively. The overall aim is to provide the lowest possible cost and maximum ecosystem services.



Evolution of grassland growth after planting.



PHASE 4:

Grazing of the plot using regenerative livestock to maintain urban parks

A flock of **11 sheep** was used for **14 days** who effectively grazed the plot (to the extent equivalent to conventional urban park maintenance) while fertilising it through their droppings and urine.



Appearance of the plot after sheep grazing.

“ Through this intervention, a degraded wasteland has been converted into native grassland that will become part of the museum facilities related to the Sestao Blast Furnace, part of our cultural heritage, in a municipality with a high population density and very few green spaces.”

Managing Director of Sestao Berri Public Company.



Agents involved

- Sestao City Council/Sestao Berri - Project developers
- Soil microbiology consulting company
- Garbiker (waste manager) - Compost supplier
- Herder
- Neiker - Laboratory Services



Economic data

Cost of the intervention:

€ 55,794.15

Funding:

€ 50,214.74

(Local Eco-innovation, 2021)



Lessons learnt

- It is important to use a suitable dosage of mature compost, as it has been proven that high doses of compost do not result in higher grassland productivity.
- The plots need to be provided with shade and water to ensure the welfare of the animals.
- The grassland should be consolidated before livestock are introduced.
- The soil quality declaration must be taken into account if there are contaminated or potentially contaminated plots, and a soil investigation may be required to ensure the safe keeping of livestock.



Barriers encountered

- The impossibility of applying compost from sewage sludge from the Galindo treatment plant (as foreseen in the design phase) due to the possible presence of pollutants and administrative issues related to transferring the sludge to a non-accredited entity.
- Difficulty in finding sheep flocks close to the pilot site.
- The concrete slab (cracked) hampers water infiltration.



Reduction of environmental impacts

- Annual cost of fertilising and mowing 1 m² of lawn: **€ 0.5 with machinery VS € 0.03 with sheep.**
- CO₂ emissions per hectare: **1,200 Kg CO₂ equivalent with machinery VS - 70 Kg CO₂ equivalent with sheep.**



Success factors

A pioneering project that uses sheep to maintain urban green space.

The sheep **effectively remove invasive species** and weeds on the plot.

Mutual benefit generated by **regenerative grazing** for the herders and **maintenance for the plots.**

Positive impact on citizen perception of urban environments by using sheep.