

SARDINIA 2025

20th INTERNATIONAL SYMPOSIUM ON WASTE MANAGEMENT,
RESOURCE RECOVERY AND SUSTAINABLE LANDFILLING
13-17 OCTOBER 2025 / FORTE VILLAGE / S.M. DI PULA (IT)



Workshop: Efficiency of WM policies in Universities

15th October 2025



Nearly Zero Waste - n0w –

Improving waste reduction and separate collection at the
University of Pisa



Prof.ssa Giulia Romano

Commissione
per lo Sviluppo
Sostenibile
di Ateneo
Università di Pisa

University of Pisa – NOW starting point

The University of Pisa is one of the oldest Italian universities.

In 2023, it counted nearly 50,000 enrolled students, including PhD candidates, master's students, and those enrolled in medical specialization programs. The teaching staff consists of around 1,600 professors, while the administrative and technical staff includes about 1,570 people.

Altogether, more than **53,000 individuals** are regularly involved in university life to varying degrees

For some time now, the University has been promoting a culture of environmental sustainability, embedding its principles directly into its statute and adopting a strategic plan for their implementation. **In 2019, it established a University Committee for Sustainable Development (CoSA)**, which includes various figures: faculty members (with a political guidance role), students, and administrative staff

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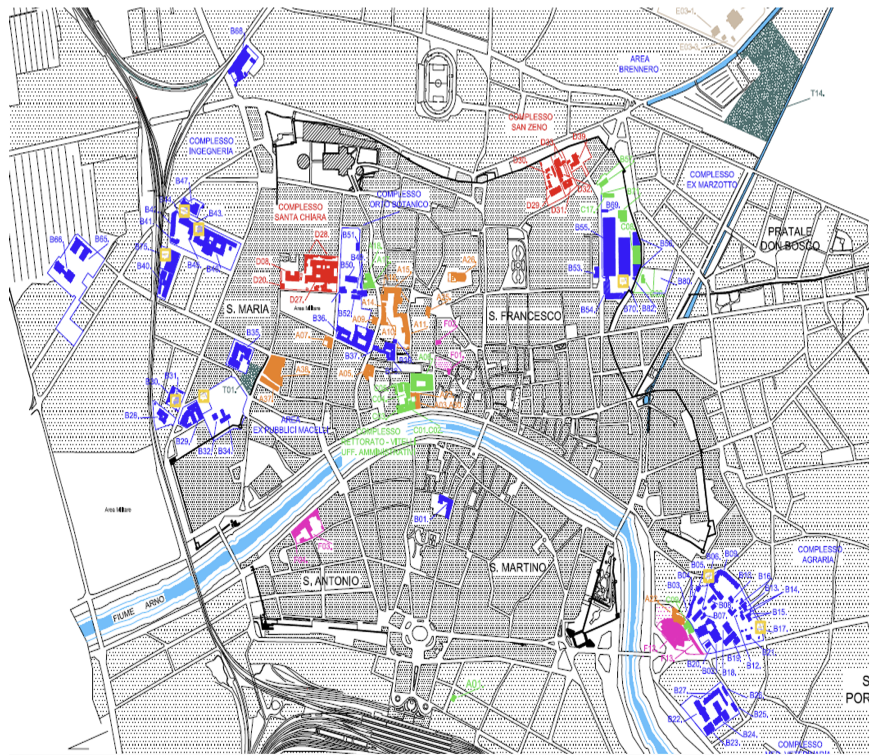
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University of Pisa – N0w starting point

The university area is located mainly within the urban area of the Municipality of Pisa.

The University consists of areas that include several adjacent buildings, as well as others scattered throughout the city centre, for a total of **approximately 150 buildings covering around 300,000 square metres**.



University of Pisa – NOW starting point

The organization of internal waste collection provided for the separation of only three types of waste:

1. **Paper;**
2. **Multi-material;**
3. **Non-recyclable.**

The material is collected in various types of containers, not always coordinated across the different buildings and uses.

The waste utility (GEOFOR) has supplied the University with cardboard containers to separately collect waste. However, there are many different types of containers, ranging from regular bins to containers of various sizes, whose disposal rules are not always clear and do not allow for proper separation of municipal waste



University of Pisa – NOW starting point

Waste collection at the university sites is currently managed by two companies responsible for **cleaning services**. Each of the two providers operates over half of the University's total area.

The University of Pisa has decided to launch a project for the sustainable management of waste. The aim is:

- to **increase separate waste collection**, both qualitatively and quantitatively, within the University — with effects also extending to the entire city of Pisa —
- to **reduce the amount of waste produced**, and
- to **encourage the adoption of virtuous behaviours** and more responsible consumption habits.

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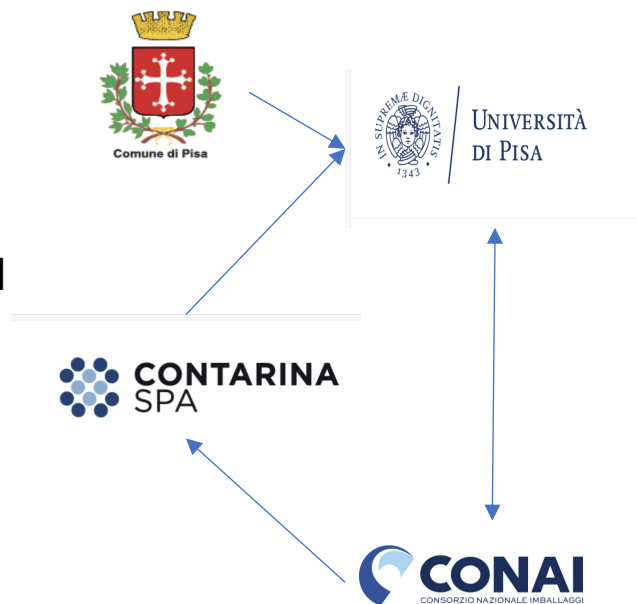
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University of Pisa – NOW starting point

CONAI supported the project by entrusting **Contarina** Spa — a company with extensive experience in various local contexts in designing integrated waste management systems — with the task of drafting it. The Municipality of Pisa joined and supported the project too.

The aim is to establish within the university area a waste collection model that is **effective, efficient, and sustainable both environmentally and economically**, becoming a “**pilot project**” to other universities and for many other local entities: hospitals, the airport, museums, and other cultural centres.



University of Pisa – NOw starting point

There were no available assessments of how much the University's production of municipal waste affects, in terms of quantity and quality, the separate waste collection results of the Municipality of Pisa.

Only the “Ex Marzotto” area — which hosts the Departments of Mathematics, Physics, and Computer Science — is equipped with roll-off containers where bags of separated waste are deposited, and their weight is recorded by GEOFOR.

In **2022** the separate collection rate was **45%**.

In **2023**, a sample-based waste composition analysis, conducted on over 150 kg of the “**multipack**” fraction (plastic and aluminium) revealed that only 23% of the waste was compliant, while **77% consisted of non-target materials**.

Moreover, **around the 90% of unsorted waste was recyclable (more than 60% paper)**



University of Pisa – NOW starting point

It was carried out an experimental assessment over two consecutive weeks in **two defined contexts**, including the waste generated by the cafés located within the departments.

Based on the data collected, the current separate waste collection rate ranges **from 55% to 65%**, which corresponds to the figures reported by the Municipality of Pisa.

The total annual TARI (waste tax) costs paid to the Municipality of Pisa for the years 2021, 2022, and 2023	2021: € 502.369,97	
	2022: € 539.582,04	+7,4%
	2023: € 561.923,99	+4,1%

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University of Pisa – The n0w Model

n0w
[Nearly Zero Waste]

The new model took inspiration by the integrated waste management model of a city, adapted to a different territorial context — with specific features and smaller-scale needs, yet equally complex, like a “**city within the city**”

Unipi was inspired by Paolo Contò approach (Source: «La gestione responsabile dei rifiuti»)



University of Pisa – The n0w Model



The key elements on which the “Model” is based are the following:

- ✓ integrated communication;
- ✓ prevention;
- ✓ training;
- ✓ separation through appropriate equipment;
- ✓ efficient and controlled collection and transport;
- ✓ monitoring;
- ✓ the information system.

N0w – Integrated communication

The organization of internal waste sorting was based on the **new color scheme** for the different waste fractions, in compliance with UNI Standard.

“Let the colors guide you” is the slogan used to promote environmental awareness

✓ Two launch videos and other communication materials such as boxes and postcards and a visual installation with artistic photos, actively engaged the students and university staff

✓ Dedicated website pages



<https://www.youtube.com/watch?v=2ukGCgBCD9o>

YouTube IT Cerca

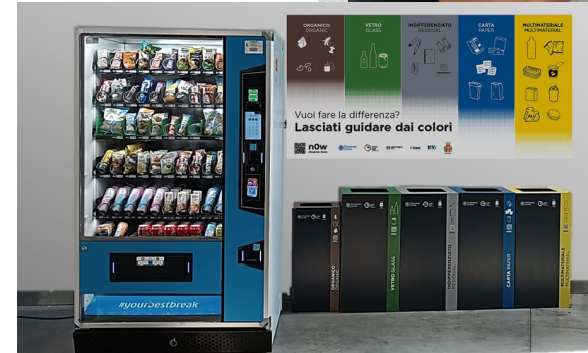
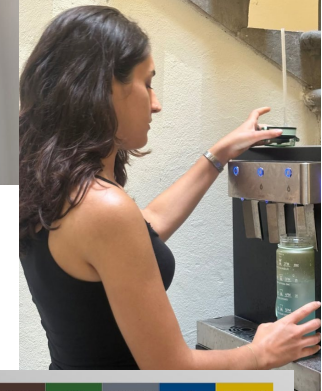


N0w – Prevention

In July 2025, the installation of new vending machines and water dispensers was completed, already resulting in a reduction in single-use plastic waste:

- No bottled water in vending machines
- No single-use plastic cups for coffee and hot beverages

Plastic cups and stirrers in the vending machines have been replaced with compostable products, and users can now choose to use their own mug or cup, paying only for the beverage.



N0w – Training

The training sessions were addressed in person or online to all members of the University community
Specifically, the in-person sessions were devoted to:

- ✓ Students
- ✓ Administrative personnel
- ✓ Teaching and Research Personnel
- ✓ All cleaning personnel

Available online on youtube



N0w – Separation and equipment -

✓ In offices and faculty rooms, only **paper bins** were provided – **no more non-recyclable waste bins inside offices**

✓ In the **handwashing area of the restrooms, bins dedicated exclusively to paper are provided**. In both women's and unisex restrooms, stainless steel pedal bins for sanitary pads.

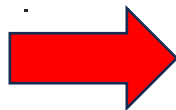
✓ Placement of a **complete waste-sorting station** equipped with containers for separate collection, which can be set up inside the room if it is an open space, or otherwise in the corridor outside the office.

The waste-sorting station includes **five containers** for

1. **Paper**
2. **Multi-material recyclables**
3. **Biowaste**
4. **Glass**
5. **Non-recyclable waste**



N0w – Separation and equipment - inside



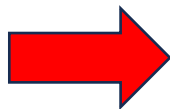
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N0w – Separation and equipment - outside



N0w – collection and transport

- Collaboration with Pisa Municipality and local waste utility was developed to review waste disposal sites and collection methods at major university sites (reducing the number of containers, increasing collection rounds, and introducing bins for specific waste categories such as small WEEE).
- Locked containers and placement of urban waste containers in controlled-access areas



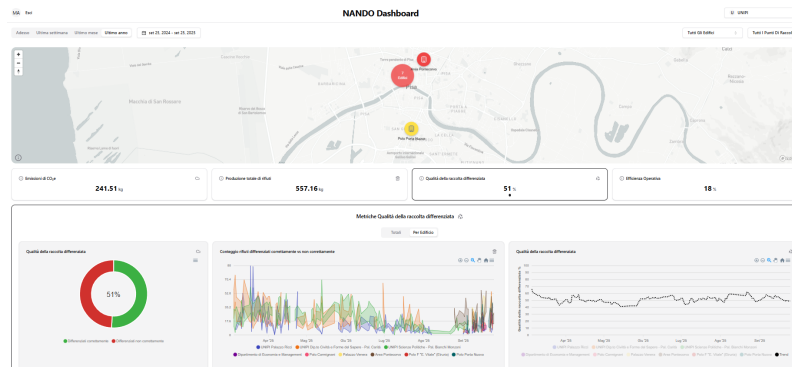
N0w – monitoring and information system

Nando is an application that allows to monitor the bins through periodic photos. These images are analyzed by artificial intelligence to provide insights on waste quantity and quality. **We currently monitor 109 bins: our goal is to increase this number to around 350 by 2026.**



Ultima foto Con Contaminanti
ott 07, 2025 - 18:00

[Reimposta Zoom](#)



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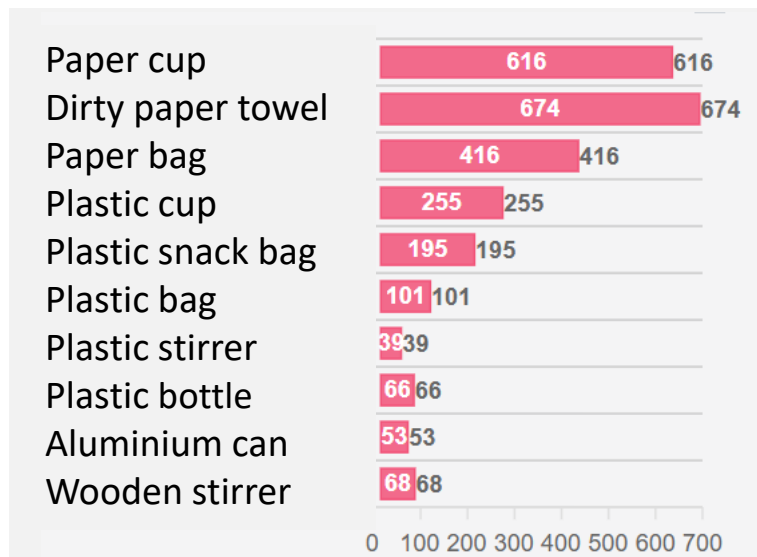


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N0w – monitoring and information system

NANDO provides data also on the most frequent **waste-sorting errors**; based on this information, **targeted awareness campaigns** are currently ongoing.

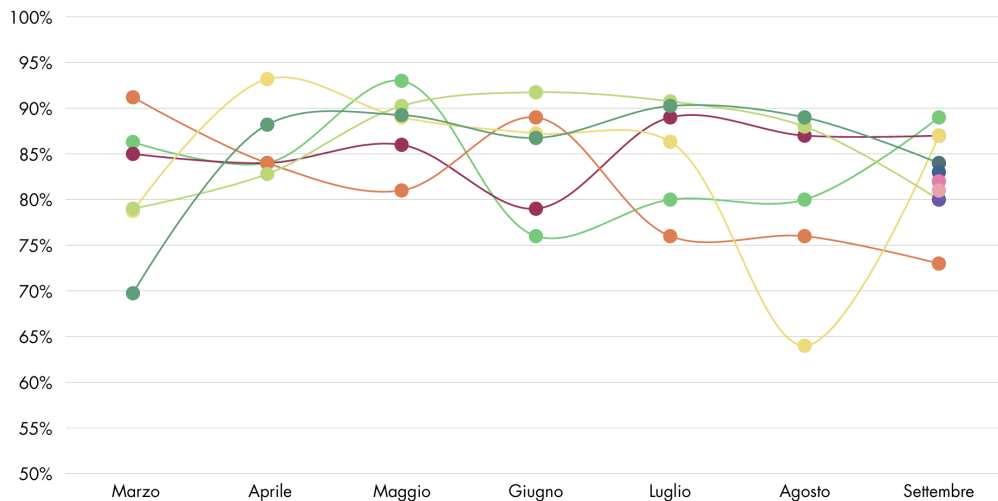


*This image shows the number of times each of these recyclable items was thrown into the **non-recyclable bin***

University of Pisa – information system

% Separate collection - 2025

Last available data
show a range 73-89%



Mese	Polo Piagge	Polo F "Etruria" Emilio Vitale	Palazzo Vitelli	Dipartimento Civiltà e forme del sapere	Palazzo Ricci	Scienze Politiche - Pal. Bianchi Monzoni	Dip. Economia & Management	Polo Carmignani	Polo Venera	Area Pontecorvo	Polo F "E. Vitale"	Polo Portanuova
Marzo	86,30%	85,00%	91,20%	78,80%	79,00%	69,80%						
Aprile	84,00%	84,00%	84,00%	93,20%	82,80%	88,20%						
Maggio	93,00%	86,00%	81,00%	89,00%	90,30%	89,30%						
Giugno	76,00%	79,00%	89,00%	87,30%	91,80%	86,80%						
Luglio	80,00%	89,00%	76,00%	86,30%	90,80%	90,30%						
Agosto	80,00%	87,00%	76,00%	64,00%	88,00%	89,00%						
Settembre	89,00%	87,00%	73,00%	87,00%	80,00%	84,00%	84,00%	83,00%	80,00%	82,00%	82,00%	81,00%

Separate waste collection – Data about quality

2023

~ 20% on Multi-Material (Plastic and Metal)



2025



set 24, 2025 - 23:36

[Reimposta Zoom](#)



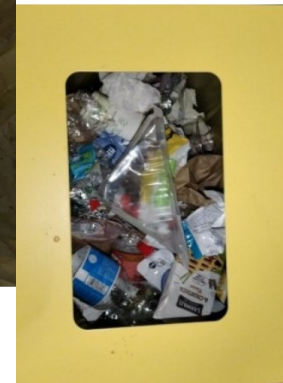
ott 09, 2025 - 12:50

[Reimposta Zoom](#)

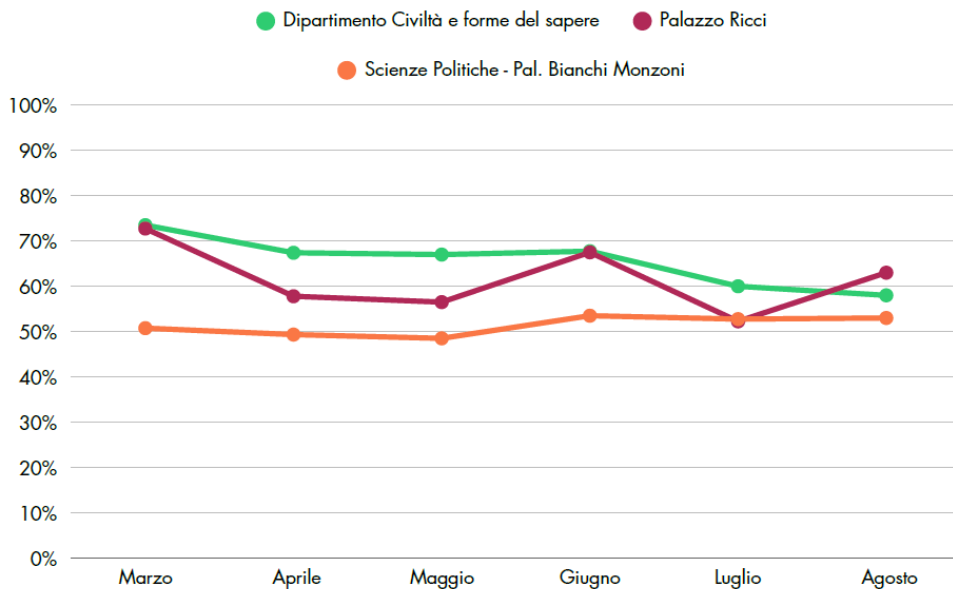


ott 08, 2025 - 20:00

[Reimposta Zoom](#)



Andamento temporale



60%

Qualità media della
raccolta differenziata

★ Data Insight

Il valore è calcolato come rapporto tra il numero di oggetti correttamente differenziati e il totale degli oggetti analizzati.

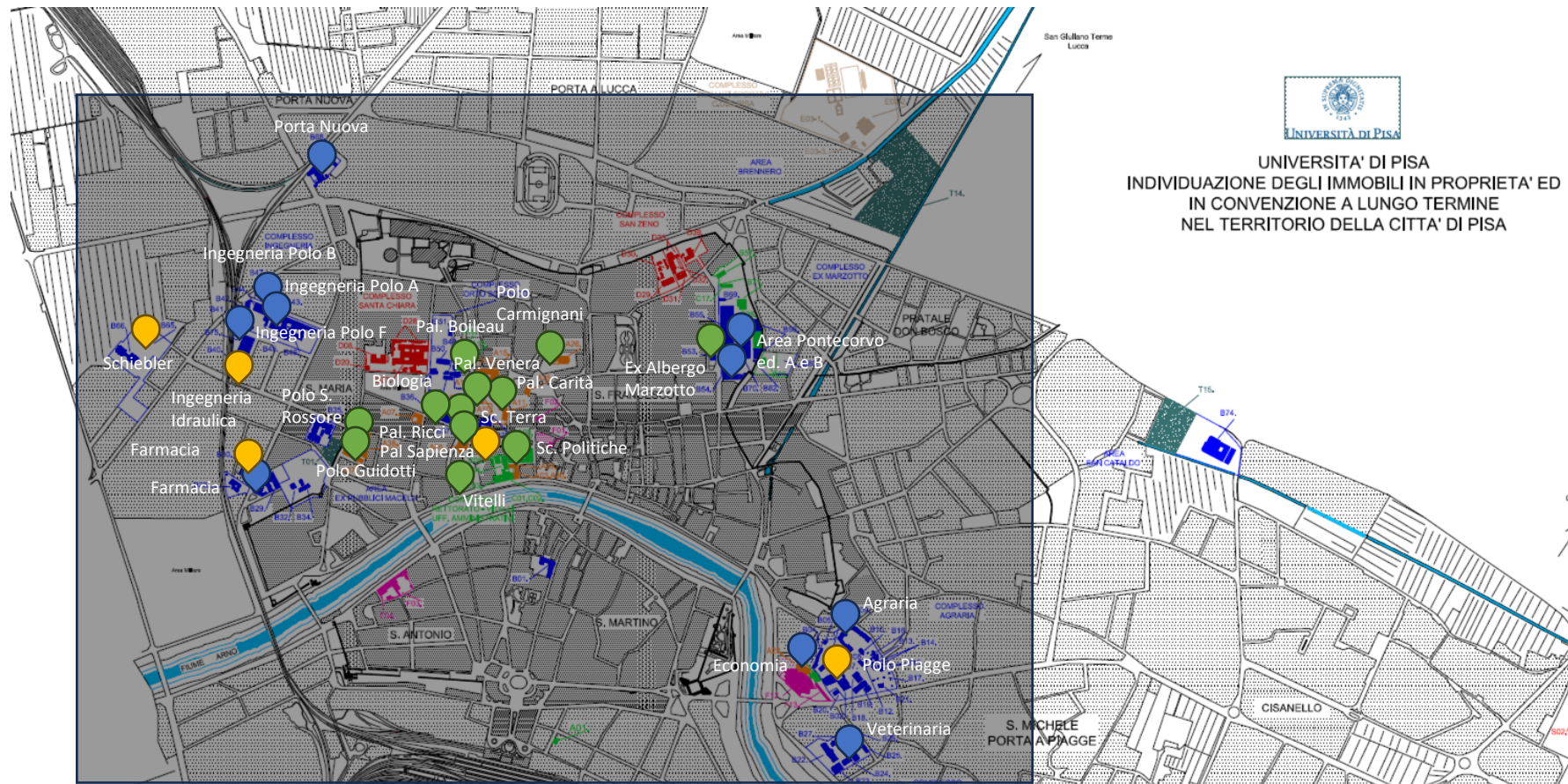
L'unità di misura utilizzata è il numero assoluto di oggetti, convertito in percentuale.

Next steps

- Use of **new tools to engage** the university community, such as quizzes or contests on proper waste sorting between buildings and departments
- Further monitoring results using a **larger sample of bins**
- Further waste separation increase in **outdoor area** bins and university bars
- A **new human resource** to support monitoring activities
- Strengthen **collaboration with university canteens** managed by a regional company (DSU) — reiterating requests to reduce the use of single use items (both plastic and non-plastic) in canteens and for take-away
- Promoting the dissemination of the n0w principles and tools (eg with hospitals).

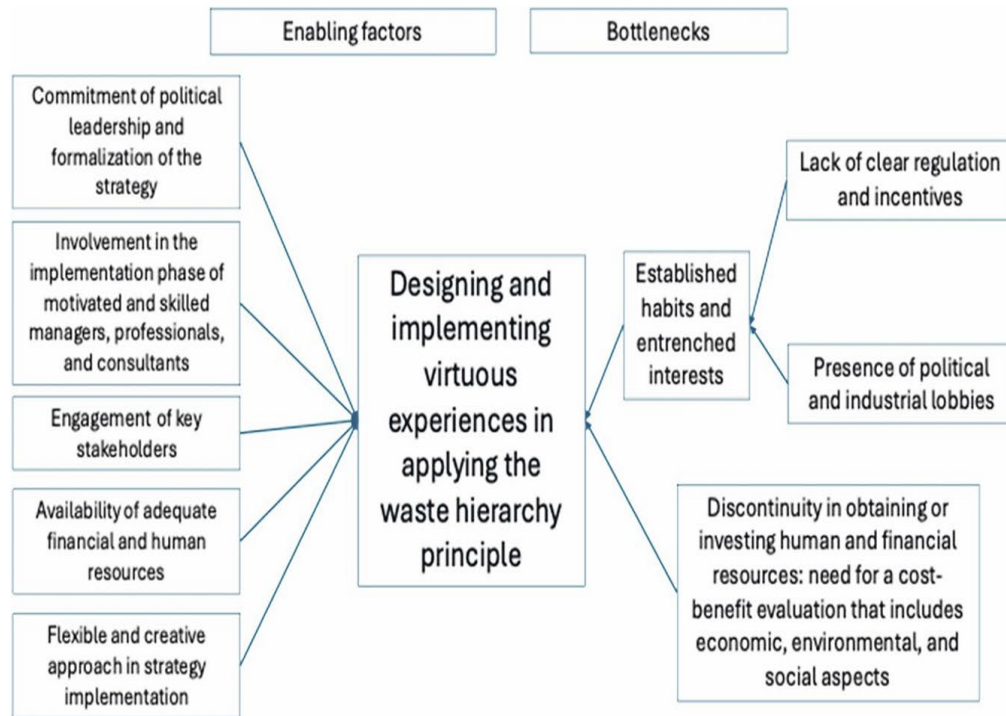


Future monitoring activity with app NANDO



n0w: Critical issues for enabling factors and bottlenecks

- ✓ High commitment of political leadership and formalization of the strategy
- ✓ Involvement of motivated consultant but **lack of motivated and skilled internal managers**
- ✓ Engagement of key stakeholders but **delay in the development of some phases**
- ✓ Financial resources from Unipi CONAI and Pisa Municipality but **few skilled HR**
- ✓ High flexibility in timing



- ✓ **Pisa doesn't have a PAYT**
- ✓ Committed and skilled municipal technical staff: high motivational activity
- ✓ **Problems with externalization of critical services: difficulties in relationships with DSU (university canteens), cleaning companies, and vending machine providers**
- ✓ **Lack of resources due to budget restrictions**
- ✓ Integrated reporting and strong relationship with the Pisa municipality

Thank you for your attention

Prof.ssa Giulia Romano

Water and Waste Representative of the Sustainability
Commission of the University of Pisa

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