

Cicli di produzione del suolo

Rigenerare i paesaggi di scarto: le filiere del rifiuto organico e dei materiali da demolizione



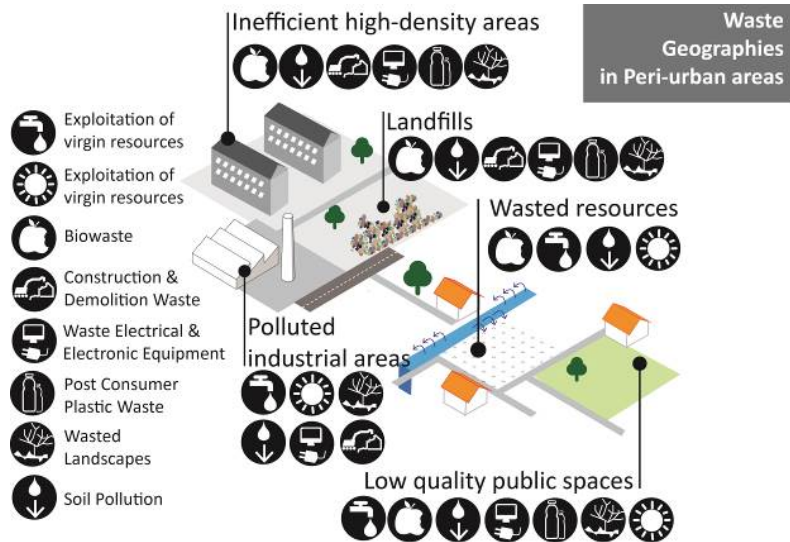
Proff. Michelangelo Russo, Libera Amenta, Anna Attademo

REPAiR - REsource Management in Peri-urban AREas

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688920



LA RICERCA REPAIR



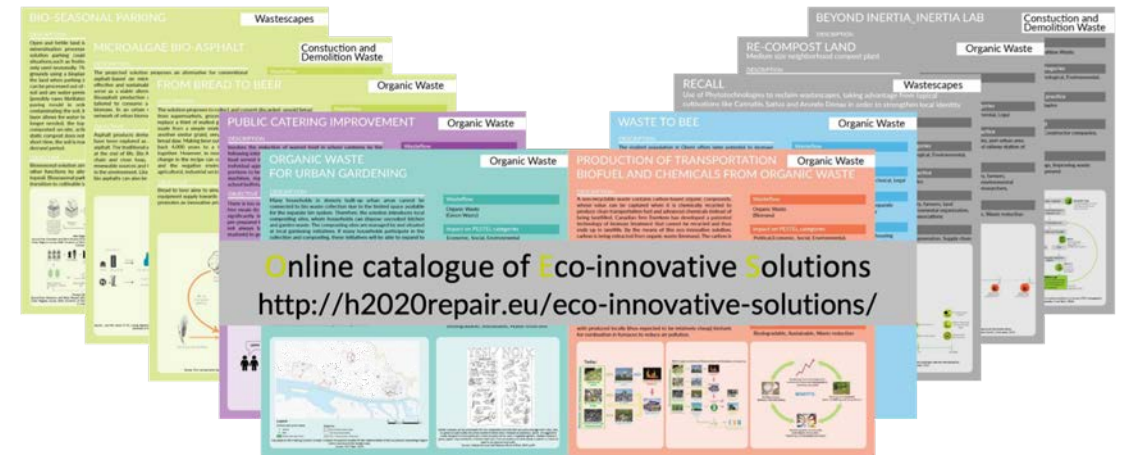
6 Peri Urban Living Lab

7 FLUSSI DI RIFIUTO

+WASTESCAPES

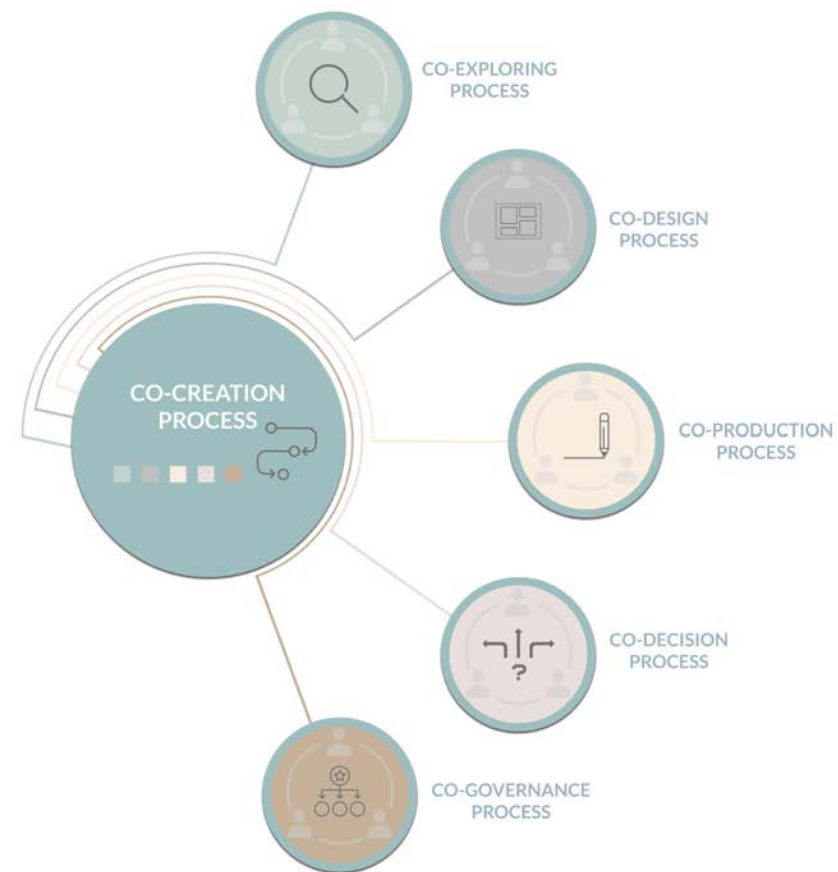
OLTRE 100 SOLUZIONI

Around 100 Eco-innovative Solutions



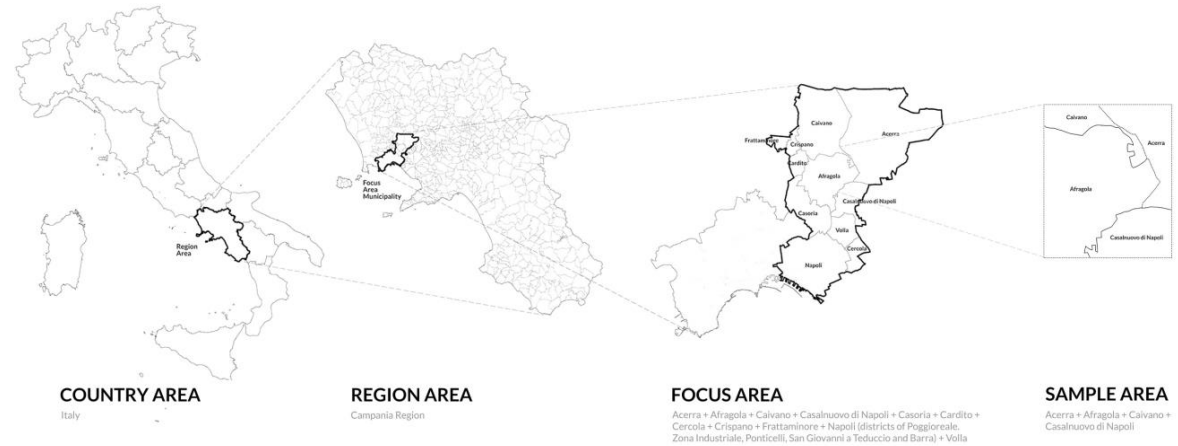
OBIETTIVI CHIAVE E RISULTATI

Processo di Co-creazione

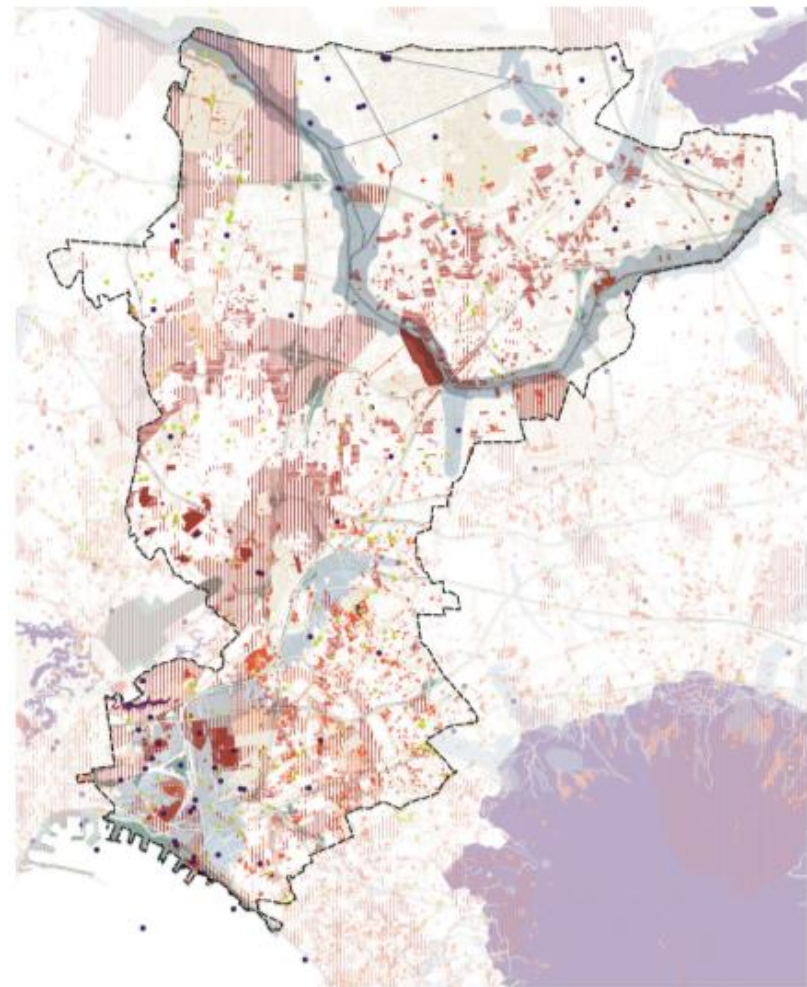


CASO STUDIO

11 Comuni dell'area metropolitana di Napoli (Ambito Territoriale Ottimale 1-3 della Regione Campania)



WASTESCAPES MAPPING



CODE	LEGEND	CODE	LEGEND
nfh8.4.	● Degraded land (contaminated and potential contaminated land)	nfh13.6.	■ Degraded water (polluted basins and linked areas)
nfp6.6.	■ Landslide hazard	nfp7.4.	■ Hydraulic hazard
nfh31.	■ Settlement in crisis	nfh.11.6.	■ Plot division structure: High fragmented rural fields
nfh31.1	■ Abandoned industries	nfp7.	■ Peri-urban areas (Territories in Between)
nfh31.2	■ Suffering residences		
nfh31.3	■ Area without current destination		
nfh32.6.	■ Drosscape: underused area alongside the infrastructure		
nfh3.5.	--- Abandoned infrastructures		
nfw1.13.	● Operational Infrastructure of waste (all)		



ENABLING CONTEXTS

TASK 3.1 SPATIAL ANALYSIS
SCALE SAMPLE

PILOT NAPLES

NSH3. Priority areas



CODE	LEGEND
nsh6.	■ Public owned areas and plots
nsw2.	■ Wastescapes (all)



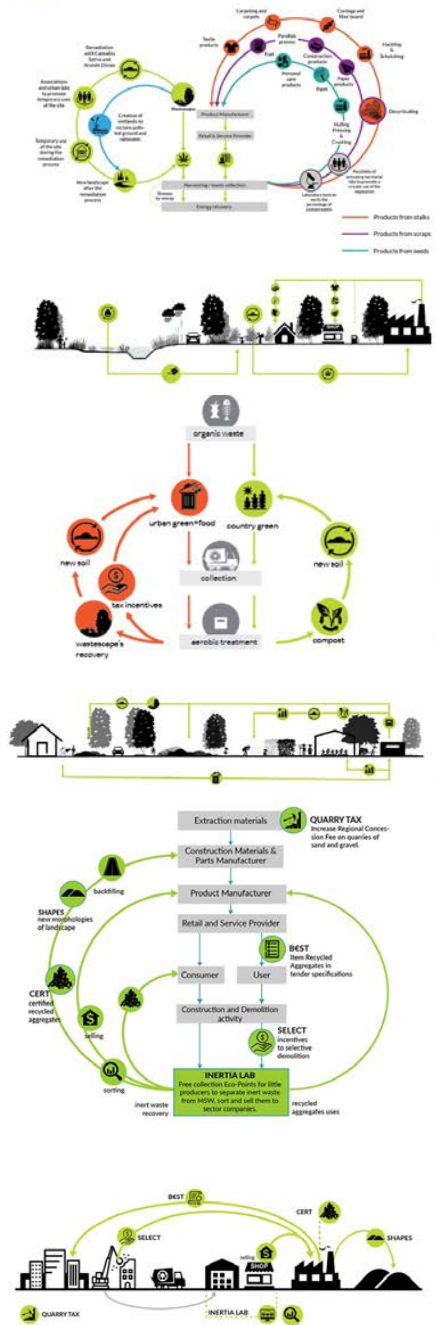
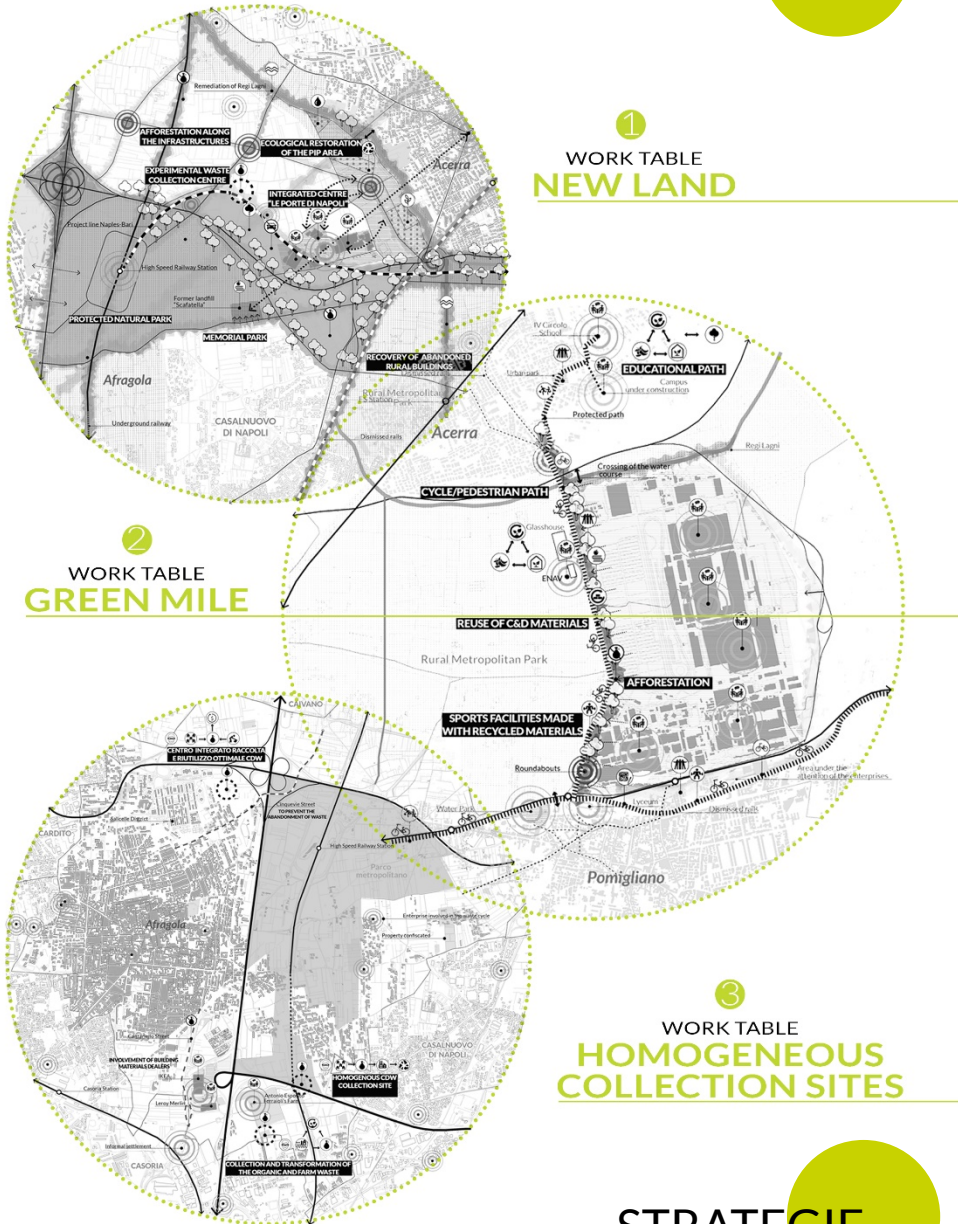
Enabling conditions

1. Wastescapes
2. Public Ownership
3. Accessibility of areas
4. Transformability of areas
5. Relation to the waste-specific geography

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1. Infrastrutture verdi 2. Nuovi suoli

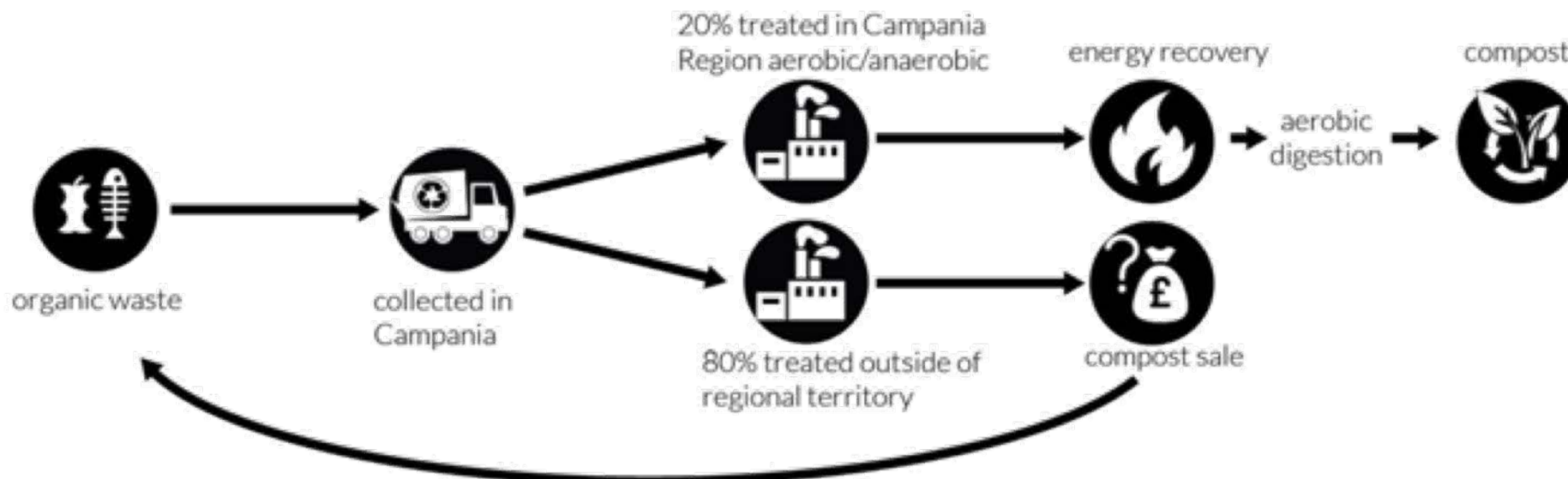
On Organic Waste flow

OW flow

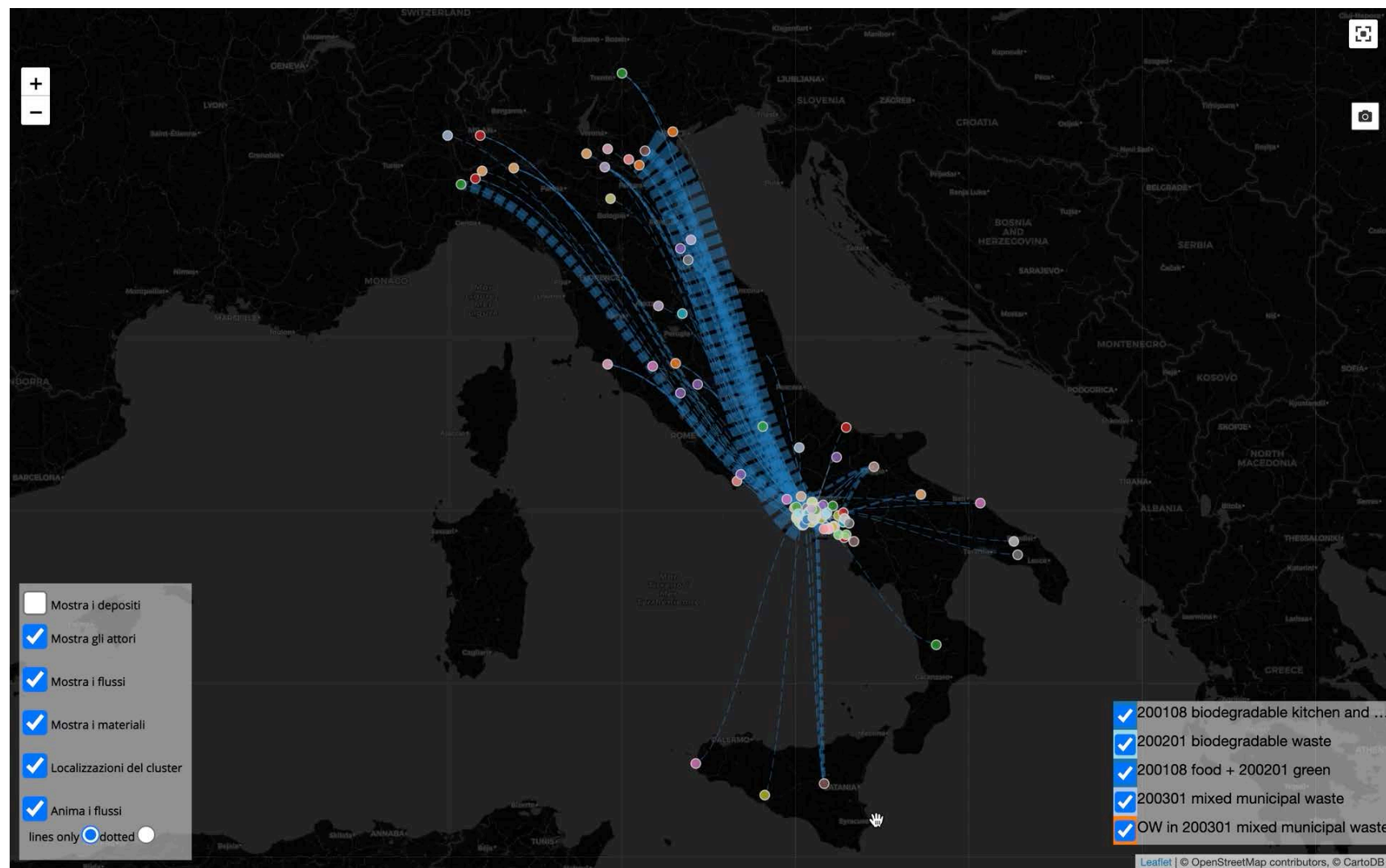
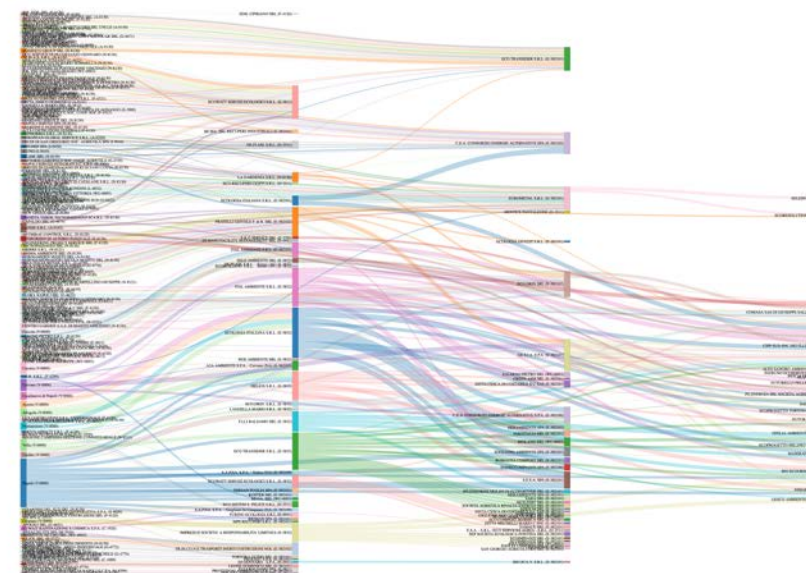
Tot: 708.000 t

67.000 t trattate

*Dati ISPRA 2017



Linear scheme of current situation Source: Francesca Garzilli, UNINA Team, 2018



REPAiR GDSE, MAN focus area Sankey Diagram and Map, UNINA Team

OW flow

Re-Compost Land. Short supply chain of Organic Waste

Flow

Organic Waste.

Category of outcome

Economic, Social, Environmental, Legal.

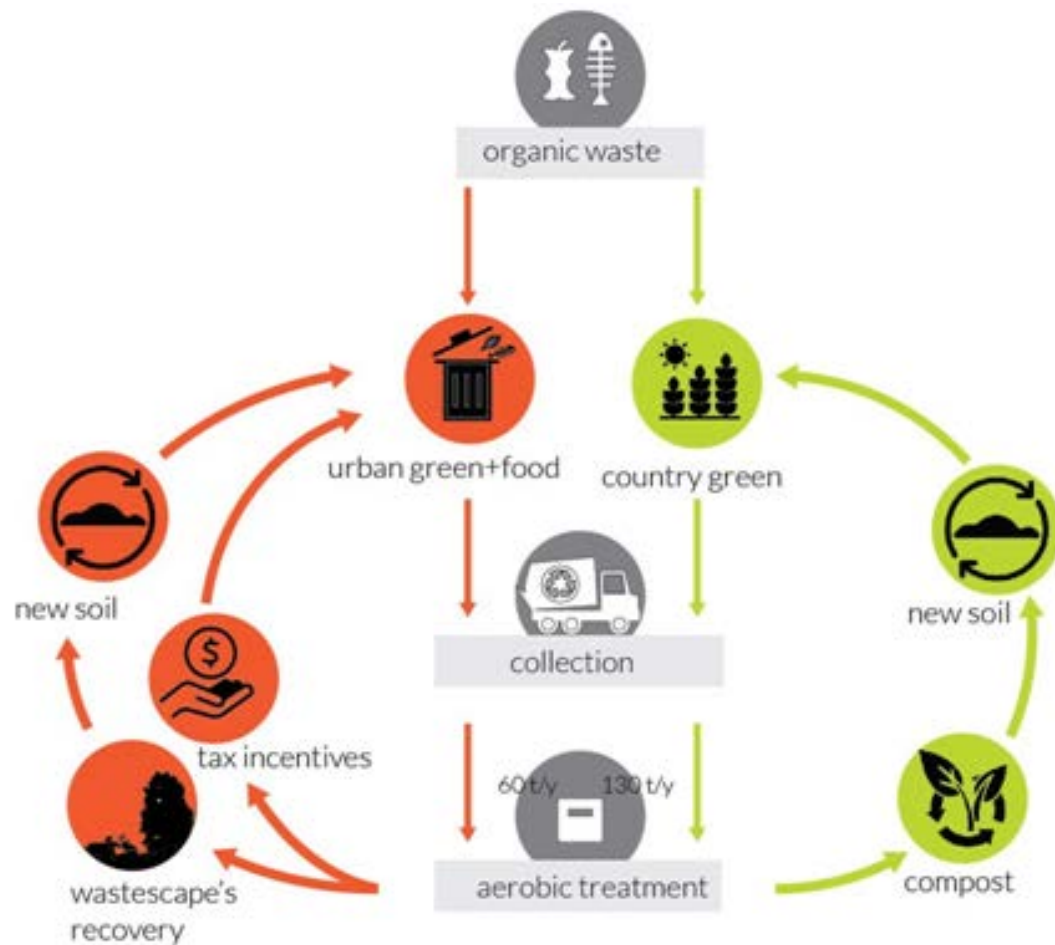
Location of the good practice

Metropolitan Area of Naples, peri-urban area surrounding the high-speed railway station of Napoli-Afragola (TAV).

Actors to be involved

Campania Region Authority (CRA), ATO (Optimal Territorial Area), Coldiretti, sectoral association, Metropolitan city of Naples, startup.

OW flow



Organic Waste. Francesca Garzilli, UNINA Team, 2018

Potential impacts

The short supply chain activates closed territorial loops based on the principles of circular economy. They are oriented towards both short and long-term results. The treatment of the OW, and the identification of buffer areas (mainly along the roads) are the first steps to re-design the terrains, and to re-think at the process in order to give new quality at the marginal areas.

Sample Area (ISPRA, 2015)

tonnes of organic waste: 45,967 t/y

number of inhabitants: 290,006

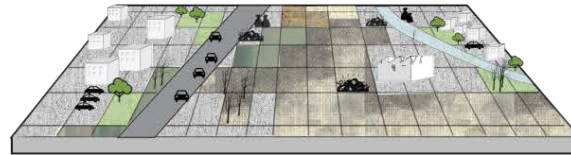
surface of mapped wastescapes: 19,294,477 m²



OW flow

- 2.1 Medium size neighborhood compost plant.
- 2.2 Creation of a New Waste Eco-District.
- 2.3 Production of safe and high-quality compost to regenerate agricultural soils in the surrounding of neighborhood compost plants.
- 2.4 Transformation of wastescapes in peri-urban farms thanks to the short supply chain.
- 2.5 Allocate part of the treated compost to shape new landscape morphologies (linked to EIS 3.5).
- 2.6 Tax Incentives to change food waste behavior of households and companies.

OW flow



Existing Situation



Localization/Dimensioning
Single plant 30 thousand t/y



Localization/Dimensioning
Several plants 5-10 thousand t/y
shape: plant as land mark



Localization/Dimensioning
several plants 5-10 thousand t/y
shape: hidden plant

	numbers of inhabitants	organic waste produced (t/y)	surfaces of wastescapes (m ²)	surfaces of public areas (m ²)
Acerra	59 573	14 254,76	4 057 867	1 309 716
Afragola	65 057	7 349,08	7 188 712	2 625 807
Caivano	37 879	3 202,08	1 032 884	936 520
Casalnuovo	49 855	9 001,82	1 443 737	599 995
Casoria	77 642	12 159,21	4 485 372	832 695
TOT.	290 006	45 967	19 294 477	6 304 734

ISPRA 2015; REPAiR team

Proposal for localization and dimension of plants treatment within enabling context

PRO	CONTRO
- pre-treatment more manageable	- NIMBY syndrome
-economically more suitable	-visual and environmental impact
-Bio Methan production: incentives	-compost not saleable

PRO	CONTRO
- lower environmental and visual impact	- lack of specific regulation
-wide citizens acceptance	- pre-treatment lower manageable (depends on waste management of the municipality)
-reduction of transports	- currently economically lower sustainable
-reduction of CO2 and leachate	
- best compost	

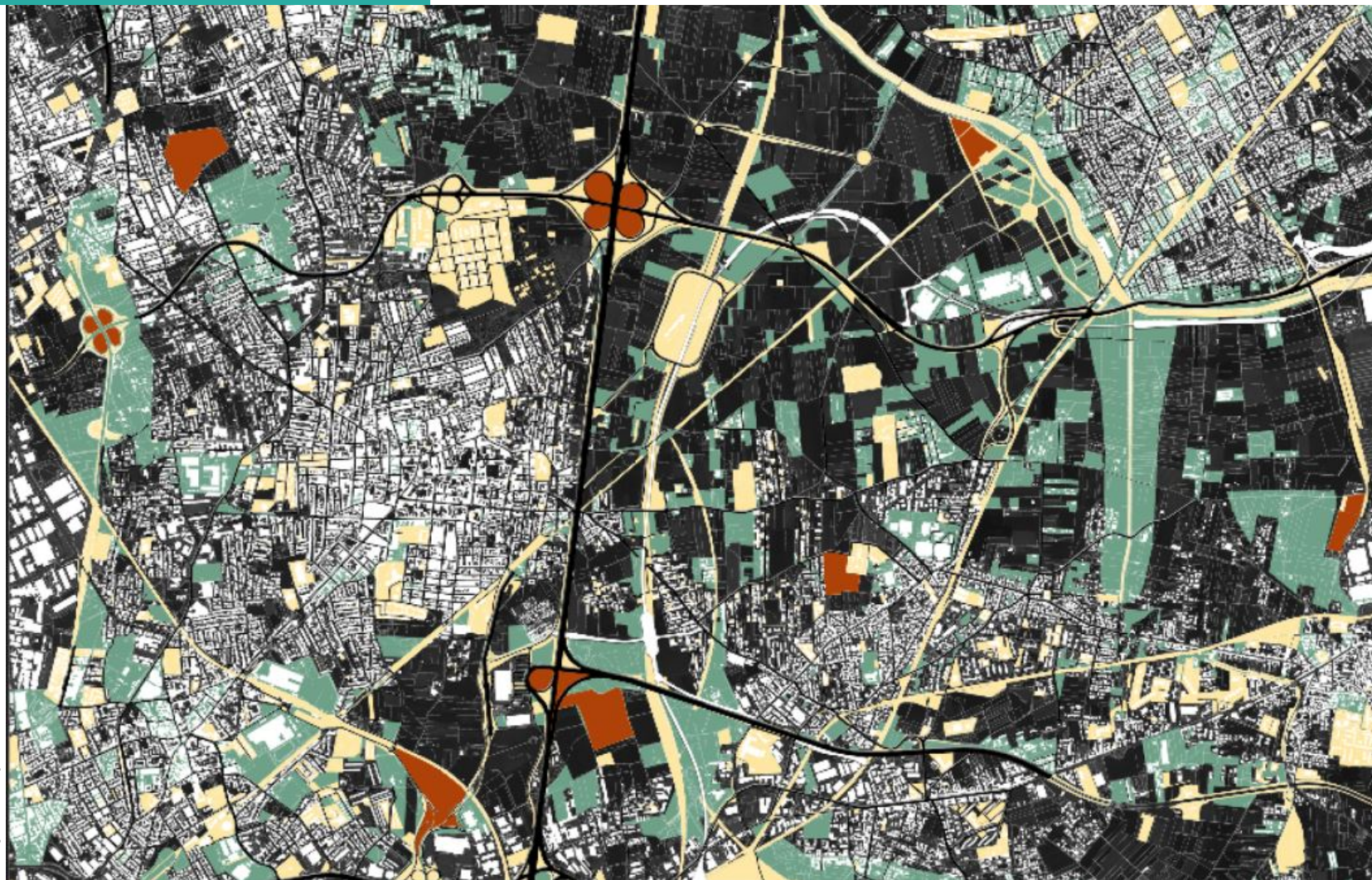
PRO	CONTRO
- lower environmental and visual impact	- lack of specific regulation
-wide citizens acceptance	- pre-treatment lower manageable (depends on waste management of the municipality)
-reduction of transports	- currently economically lower sustainable
-reduction of CO2 and leachate	
- best compost	

Graphic: by Francesca Garzilli, UNINA Team, 2019

OW flow

Possible localization for plants treatment within enabling context

Graphic: by Francesca Garzilli, UNINA Team, 2018



Legend



Acerra
200 000 m²



Afragola-Acerra
130 000 m²



Afragola
180 000 m²



Caivano
104 000 m²



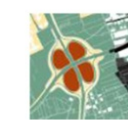
Casalnuovo
52 000 m²



Casalnuovo
48 000 m²

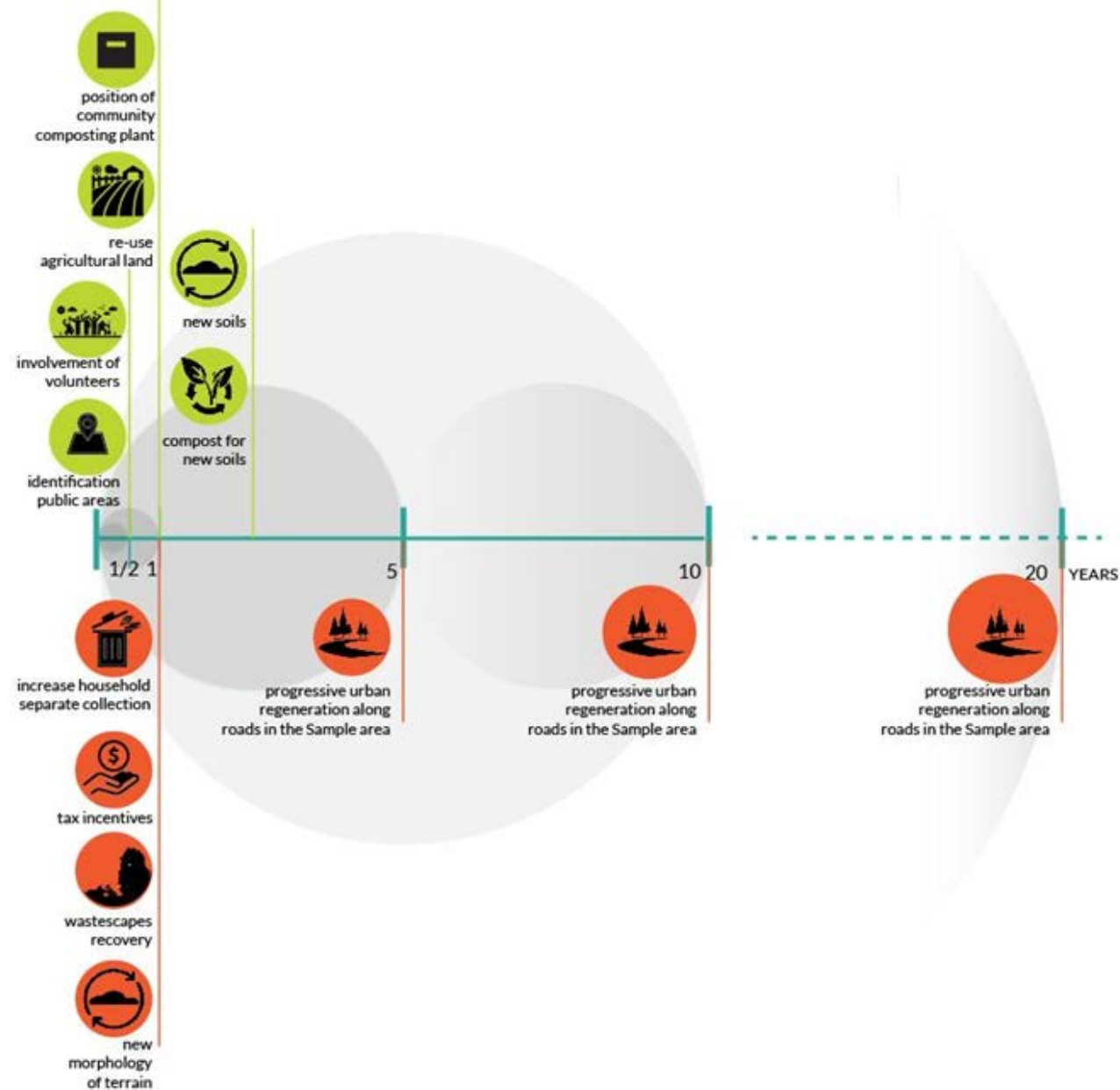


Casoria
124 000 m²



Casoria
36 000 m²

OW flow



Organic Waste. Francesca Garzilli, UNINA Team, 2018

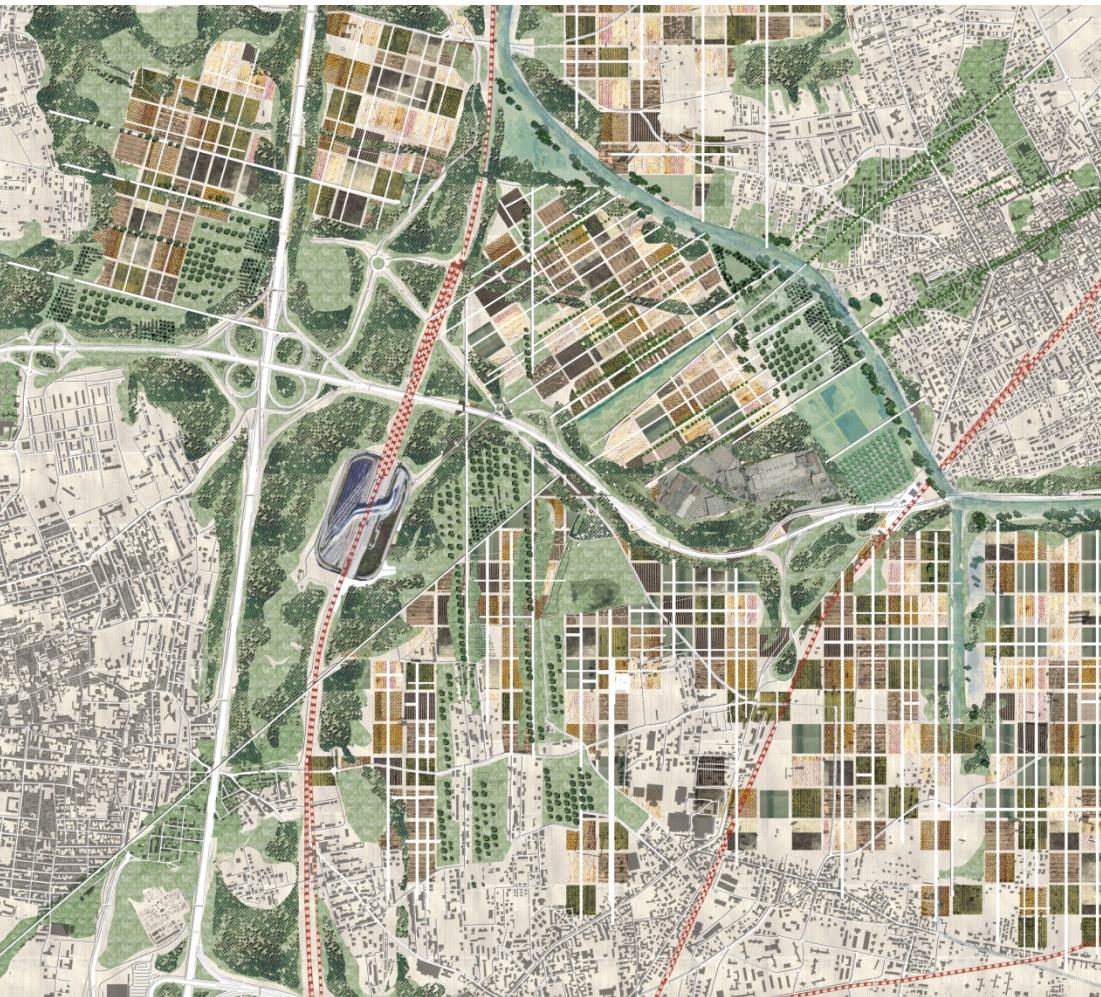
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OW flow

Treatment Plant / New Productive Landscape



Graphic: by Francesca Garzilli, UNINA Team, 2019



Graphic by Luca Esposito, Unina Team 2019

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On Construction & Demolition Waste flow

On Construction & Demolition Waste flow

1. Beyond INERTia. Circular supply chain for CDW
2. CIRO+. Integrated Center for Optimal Reuse of durable goods

CDW flow

status quo

CDW flow

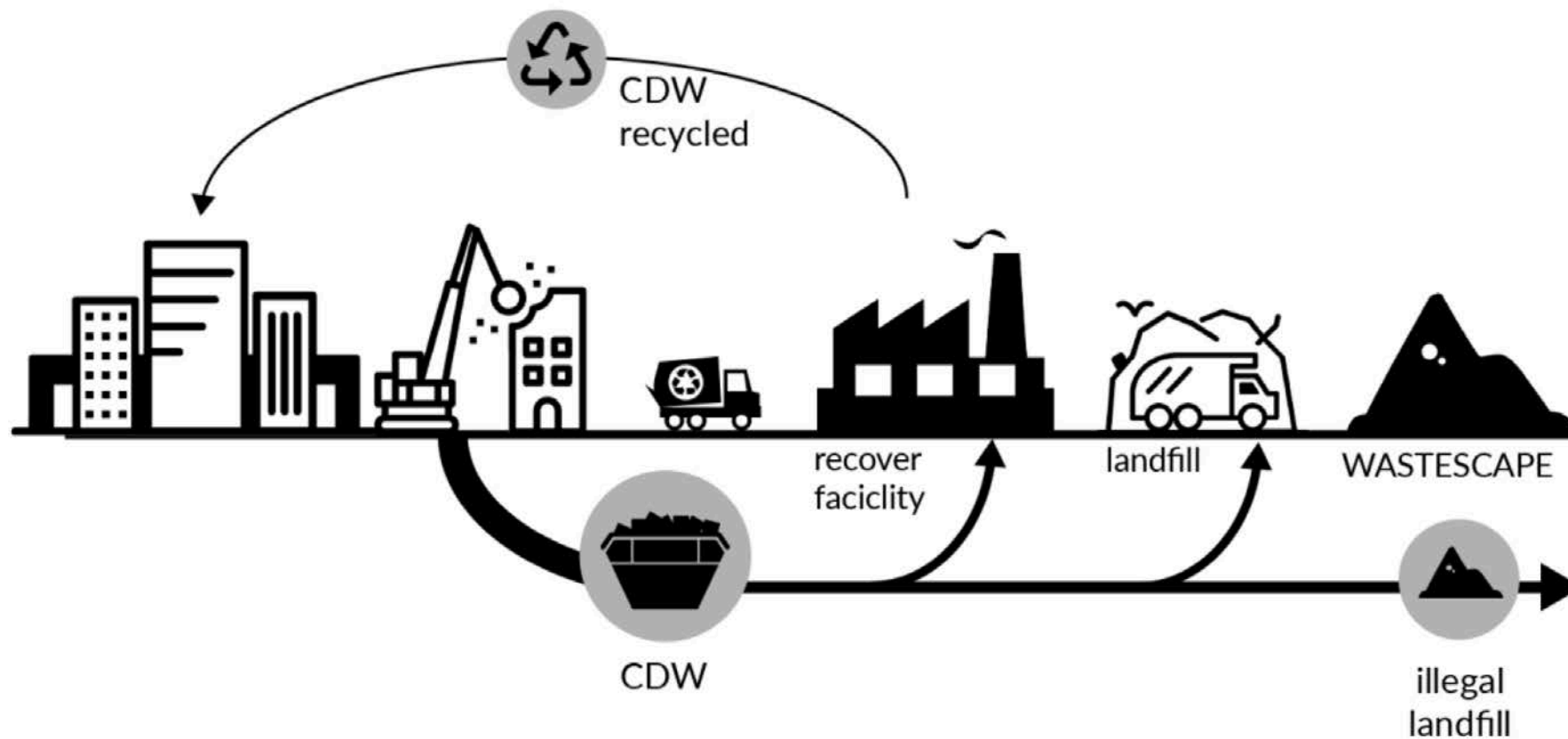


Fig. 4.3.2 Current Situation of CDW in Campania Region.

Source: UNINA Team, 2018

CDW flow

Beyond INERTia. Circular supply chain for CDW

Flow

Wastescapes, Construction and Demolition Waste.

Category of outcome

Economic, Technologic, Environmental, Legal.

Location of the good practice

Metropolitan Area of Naples, peri-urban area surrounding the high speed railway station of Napoli- Afragola (TAV).

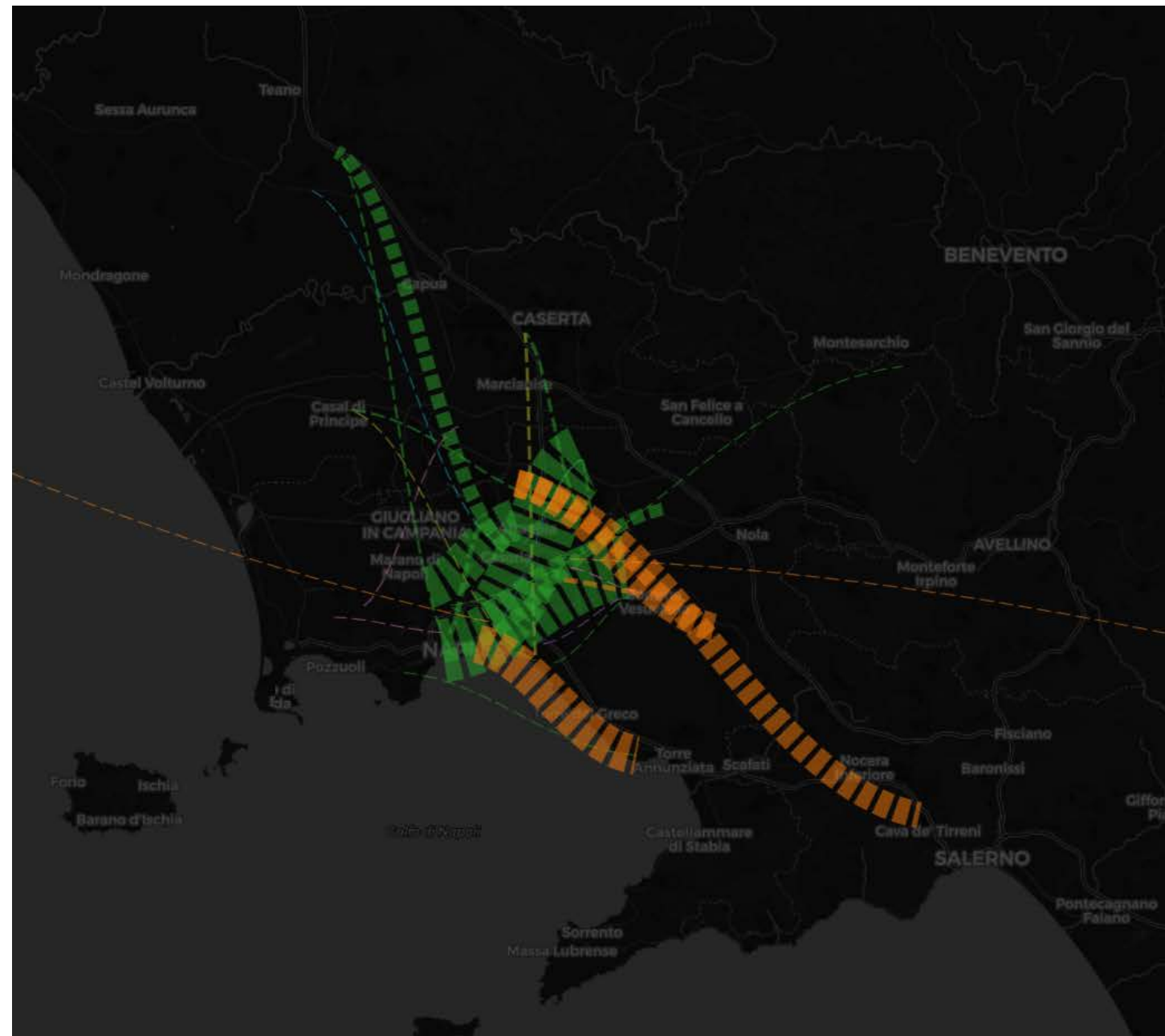
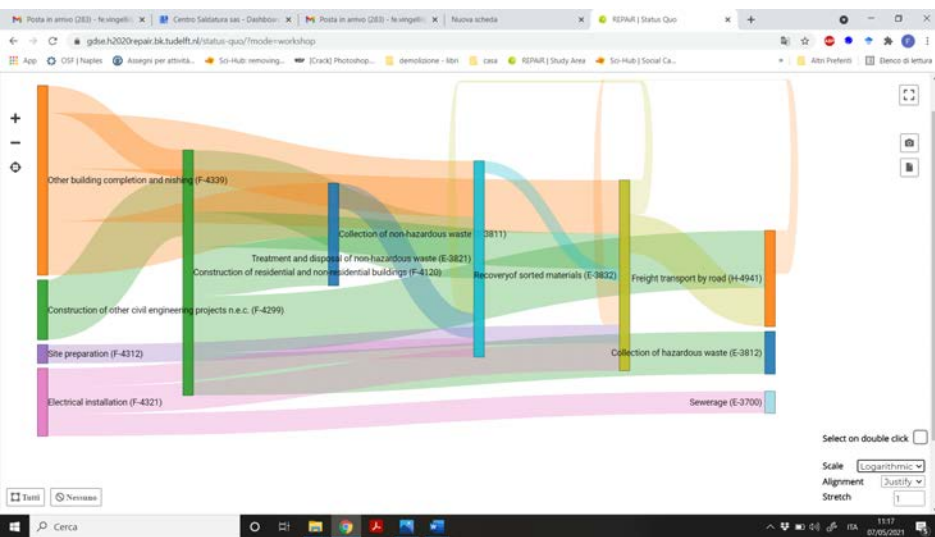
Actors to be involved

Campania Region, ATO (Optimal Territorial Area), sectoral associations, Neapolitan Association of Building Contractors (ACEN), Metropolitan city of Naples, startups.

CDW flow

Beyond INERTia. Circular supply chain for CDW

- enabling selective demolition by improving CDW separation, and meliorating the flow quality;
- avoiding illegal dumping;
- recovering inert waste from mixed rubble from MSW;
- implementing regional actions like the “regional mark of Environmental Sustainability” for recycled aggregates;
- providing inert waste for local uses and facilitating a short supply chain.



REPAIR GDSE, MAN focus area Sankey Diagram and Map, UNINA Team

Enabling contexts



Fig. 4.3.4 Work- table Homogeneous Ecological Centers. Possible sites where to apply the solution
Recover of parcel n.99 at Sheet 5 of Afragola Cadastre Terrain for the proposed integrated
collection center for building materials recover.
Source: UNINA Team, 2018



Fig. 4.3.5 Work- table Homogeneous Ecological Centers. Possible sites where to apply the solution.
Recover of parcel adjacent to Naples-Bari highline for building materials recover.
Source: UNINA Team, 2018.

Beyond INERTia. Circular supply chain for CDW

1. INERTIA LAB. Free collection Eco-Points for CDW from MSW, disposed by little producers. The Laboratory will provide to: separate inert waste from MSW, sort and sell them to sector companies.
2. QUARRY TAX. Increase Regional Concession Fee on quarries of sand and gravel.
3. SELECT. Incentives to companies that make Selective demolition.
4. CERT. Activation of “Regional Sustainability Certification” for Recycled Aggregates from Inert Waste.
5. B€ST. Putting the item and price of “Recycled Aggregates” in tender specifications.
6. SHAPES. Using recycled aggregates in backfilling operations for new morphologies of terrains along roads and around recycling areas. *linked to EIS 2.5.

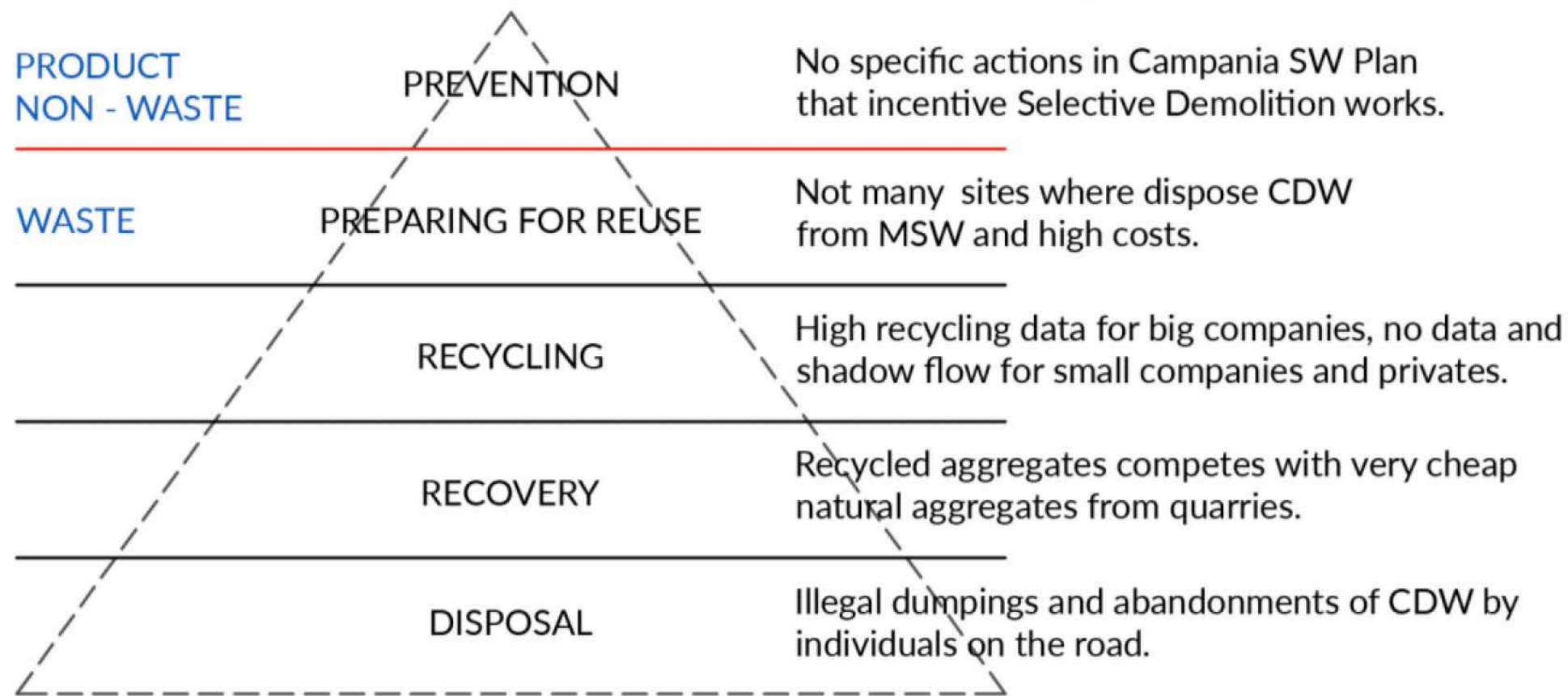


Fig. 4.3.6 Backwards Hierarchy of CD Waste Current Situation in Italy and relative main critical issues in Campania Region.

Source: UNINA Team, 2018.

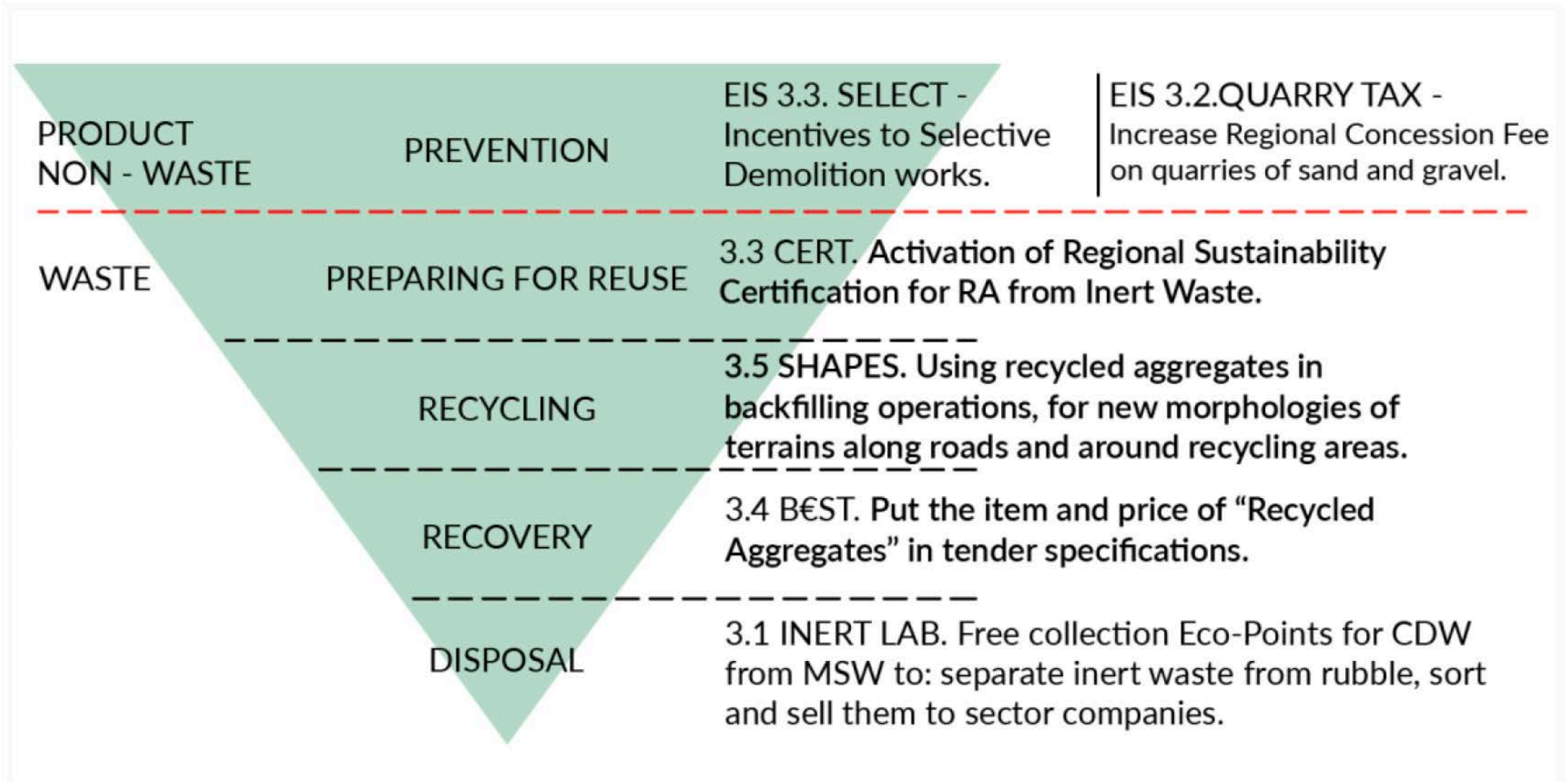


Fig. 4.3.8 EISs of Beyond Inertia Strategy in Waste Hierarchy according to the Waste Framework Directive (2008/98/EC).

Source: UNINA Team, 2018.

Potential impacts

The Strategy acts on weak points of CDW supply chain, activating practices to operationalize circular economy and to create conditions for wastescapes prevention and remediation.

- Environmental: land use/resource depletion
- Economic: labour productivity and resources productivity
- Socio-economic: total employment, knowledge-intensive jobs

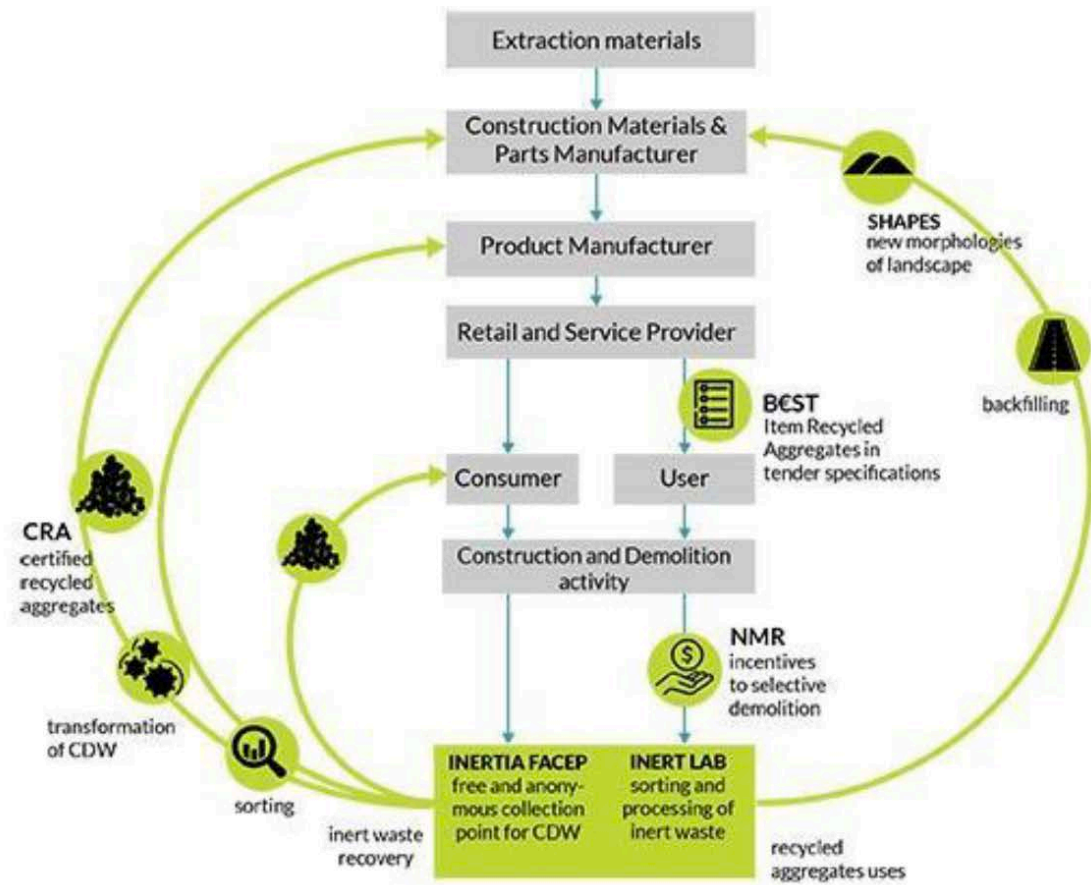


Fig. 4.3.9 Circular process scheme of Beyond Inertia Strategy and EISs.

Based on the graphic of Ellen MacArthur Foundation <https://www.ellenmacarthurfoundation.org/>

Source: UNINA Team, 2018

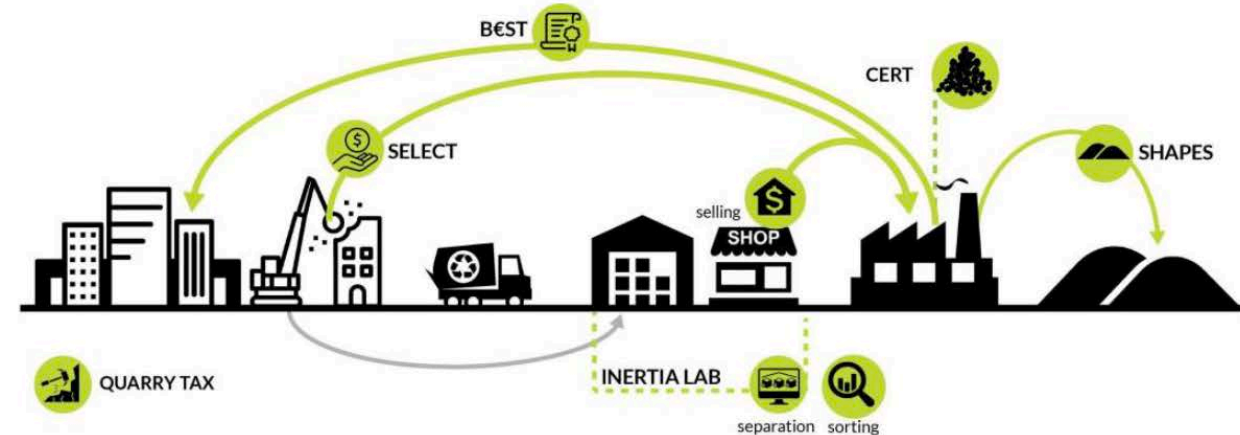


Fig. 4.3.10 Systemic section of Beyond Inertia Eco Innovative Solutions

Source: UNINA Team, 2018

CDW flow

CIRO+. Integrated Center for Optimal Reuse of durable goods

Flow

Wastescapes, CDW.

Category of outcome

Political, Technological, Social, Legal.

Location of the good practice

Wastescapes in the Focus Area.

Specific objective

Avoid abandonments of durable goods on the road by individuals, and creating a new circular supply chain for the refurbishment and upcycle of durable goods.

Actors to be involved

Campania Municipalities with more than 25000 Inhabitants, ASIA, Confartigianato Napoli, Naples Fab Lab network, Fab City Global Initiative, Design Students.

Enabling contexts

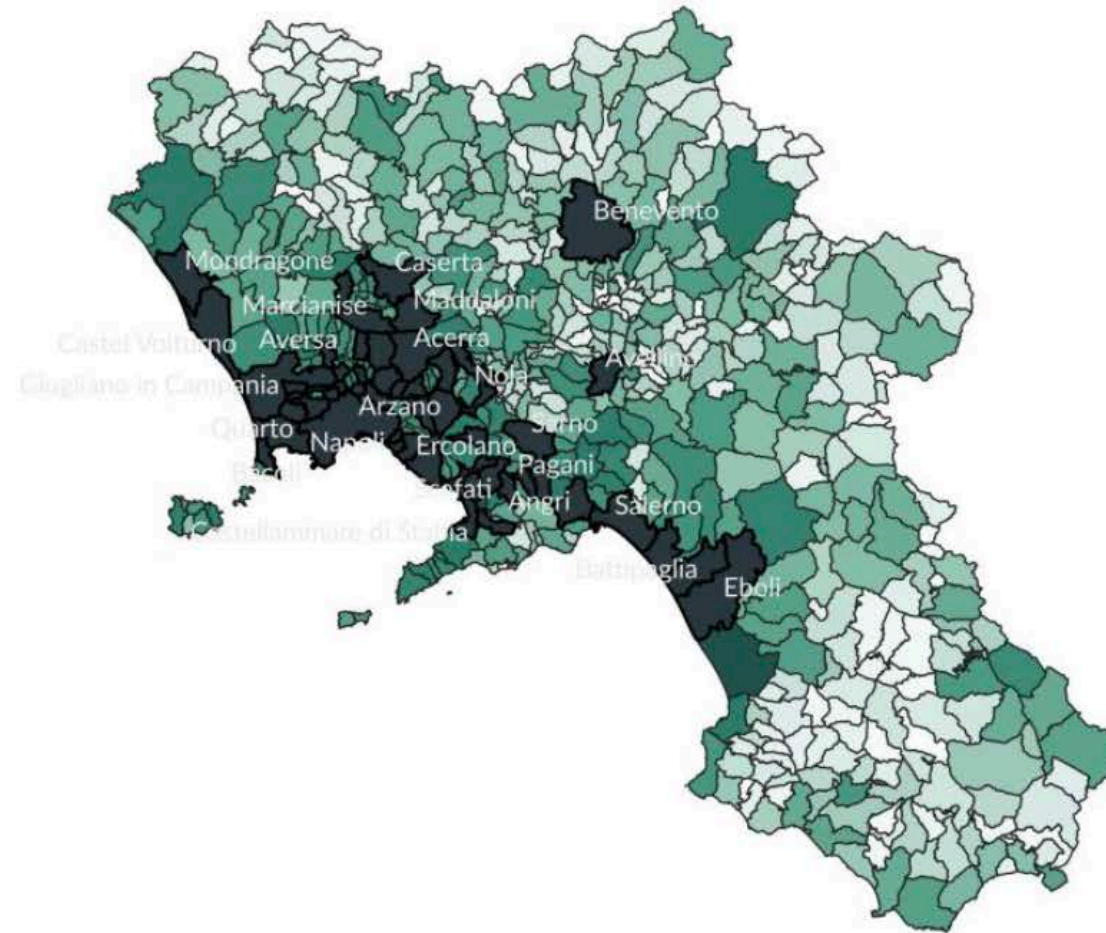


Fig. 4.3.2 In dark green: Municipalities with more than 25000 inhabitants in CR.

Source: UNINA Team, 2018

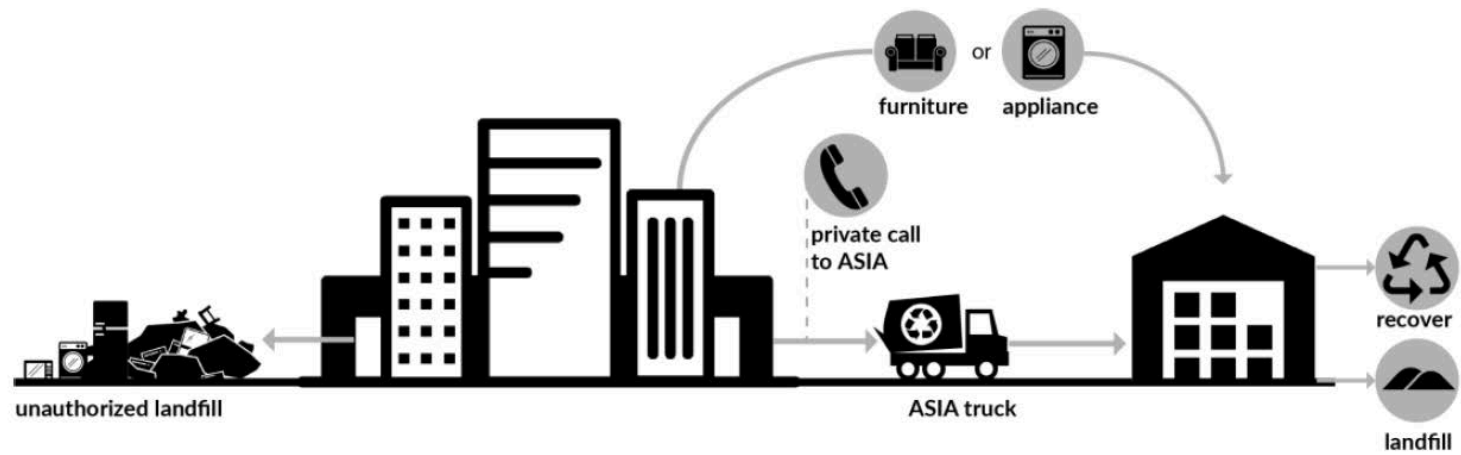


Fig. 4.3.1 Current Situation of wastescapes generation in Naples focus area.

Source: UNINA Team, 2018.

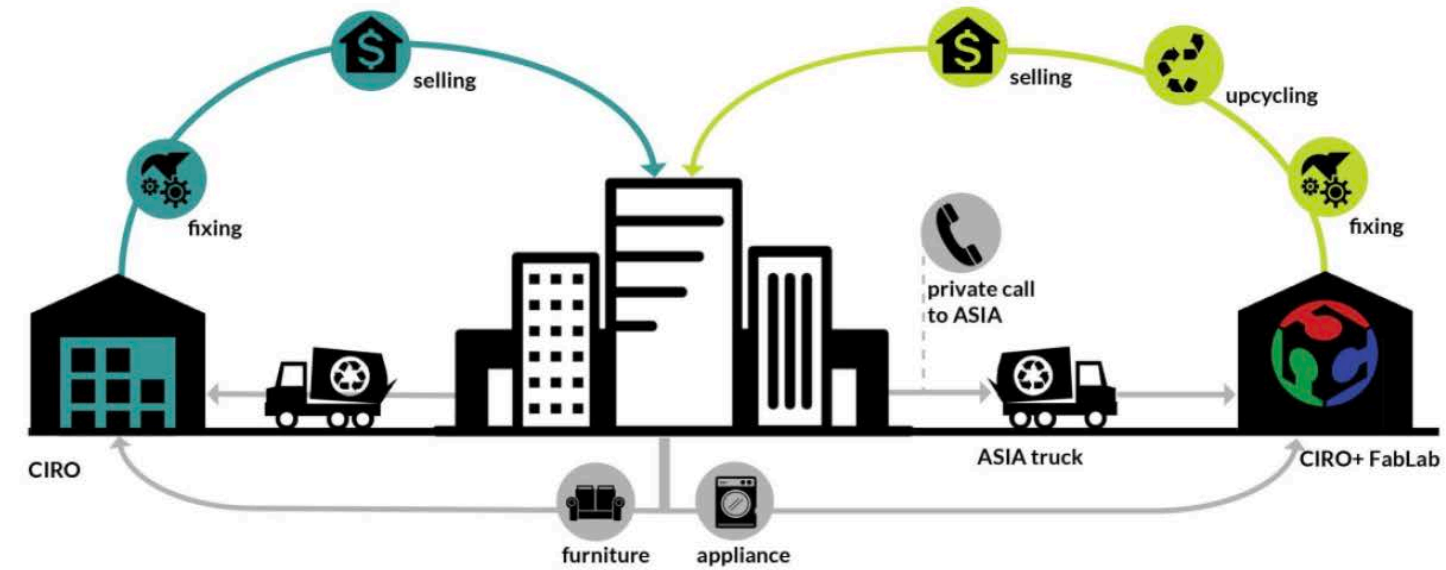


Fig. 4.3.3 Systemic section of CIRO Fab Lab. Eco-Innovative Solution

Source: UNINA Team, 2018.

On Wastescapes

Wastescapes

RECALL: REmediation by Cultivating Areas in Living Landscapes through phytotechnologies

Flow:

Wastescapes

Category of outcome:

Economic, Environmental, Technological and Legal

Location of the good practice:

Metropolitan Area of Naples (MAN). Within the work-table New Land, the considered area is located between the High Speed Railway Station (TAV) and the PIP (Plans for production settlements) zone involving Regi Lagni canal, in Acerra (Fig. 4.1.1). The work-table Green Mile, includes the area related to the cycle/pedestrian path along the provincial road axis Pomigliano-Acerra (2,5 Km) and its adjacent spaces (Fig. 4.1.2).



Enabling contexts



Name	Code	Address	Municipality	Prov.	Property	Typology of site	Contaminated matrix	Pollutants	Process 2016	Activity	Area	coord.X	coord.Y
Pellini S.r.l.	3001A304	Via Tappia, 35	Acerra	NA	Private	Waste treatment plant			Waste treatment plant	Waste treatment plant	0	44986	4532208
Zito Recupero Plastica s.a.s.	3001A320	Via Volturro, 61	Acerra	NA	Private	Waste treatment plant			Agreed Characterisation Plan	Waste treatment plant	4754	445042	4533174
Ecotrasporti	3001A349	Via Volturro 61	Acerra	NA	Private	Productive activity				Productive activity	0	445051	4533180
Regi Lagri	1506A001	Regi Lagri	Regional Site	-----	Public	Surface water	Soil/Surface and groundwater	Dioxin and Furans, Metals, PCB, IPA, Hydrocarbons, Pesticides, Carcinogens chlorinated aliphatic	Implemented Characterisation Plan	Other	0	0	0
Sonmarco Salvatore	3001A313	Conso Italia, 91	Acerra	NA	Private	Productive activity				Productive activity	0	446459	4531619
Ex F.lli Costa	3001A336	Loc. Marchese	Acerra	NA	Private	Dismissed activity				Productive activity	0	446148	4531566
P.V.C. Agip- ENI n.IT59353	3001A328	Via Bonaventuro Contrada Arvedi Sottobello	Acerra	NA	Private	Fuel service station				Fuel service station	0	446038	4530930
Terraciano Sabato	3001A345	Acerra	NA	Private	Productive activity					Productive activity	0	446579	4530500
Leonardo SpA (Ex Alenia Aeronautica SpA)	3057A511	Viale dell'Aeronautica	Pomigliano d'Arco	NA	Private	Productive activity	Soil/ Groundwater	Metals, Carcinogens chlorinated aliphatic, chlorinated aliphatic	Implemented Risk Analysis, Monitoring	Productive activity	392520	448573	4529594

Fig. 4.1.1 Work- table New Land. Possible sites where to apply the solution

Source: UNINA Team, 2018



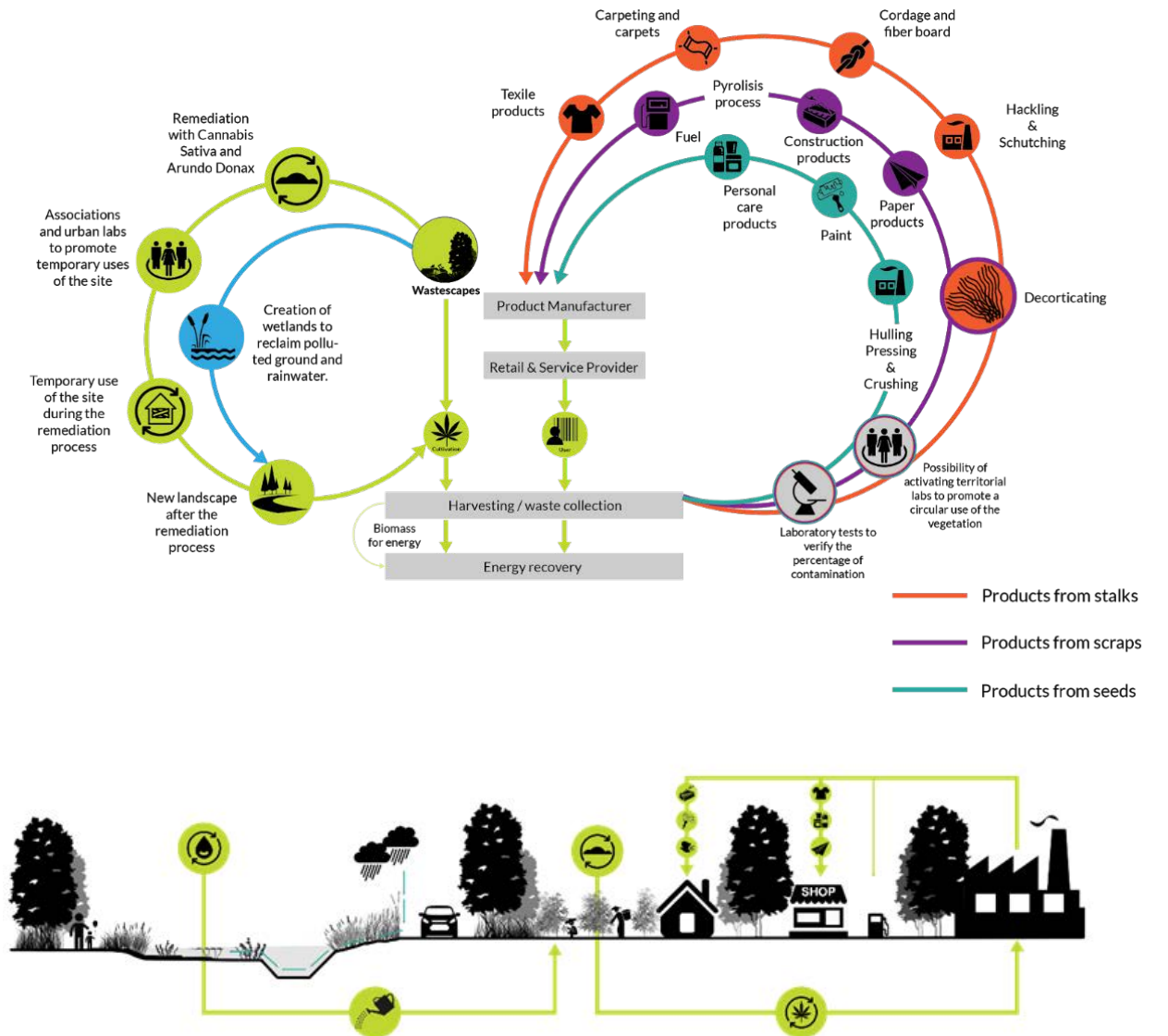
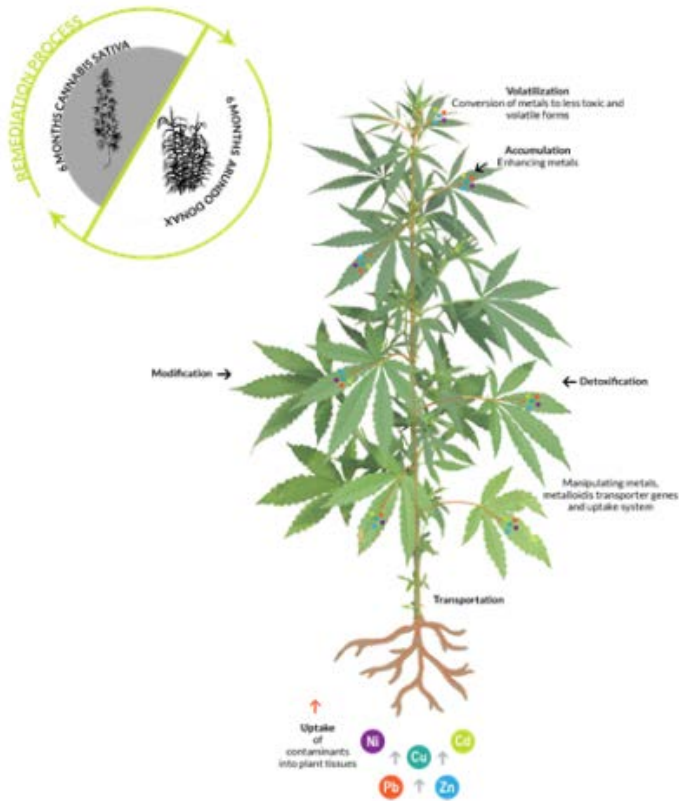
Name	Code	Address	Municipality	Prov.	Property	Typology of site	Contaminated matrix	Pollutants	Process 2016	Activity	Area	coord.X	coord.Y
Scim	3001A337	Strada Provinciale Pomigliano-Acerra	Acerra	NA	Private	Productive activity				Productive activity	0	447721	4531307
Compans Seconos	3001A509	Via Palermo	Acerra	NA	Private	Productive activity				Productive activity	0	447641	4530918
Come sa Srl	3057A522	Via Platina	Pomigliano d'Arco	NA	Private	Productive activity				Productive activity	7242	447435	4529834
Pomigliano Ambiente (Compostaggio parti)	3057A532	SP Acerra - Pomigliano	Pomigliano d'Arco	NA	Private	Waste treatment plant				Waste treatment plant	17378	448274	4530106
Pomigliano Ambiente	3057A531	SP Acerra - Pomigliano	Pomigliano d'Arco	NA	Private	Waste treatment plant				Waste treatment plant	12187	448182	4529785
Leonardo SpA (Ex Alenia Aeronautica SpA)	3057A511	Viale dell'Aeronautica	Pomigliano d'Arco	NA	Private	Productive activity	Soil/ Groundwater	Metals, Carcinogens chlorinated aliphatic, chlorinated Aliphatic	Implemented Risk Analysis, Monitoring	Productive activity	392520	448573	4529594
Fiat Auto SpA complex Special group Fiat	3001A338	Via Ex Aeroporto Acerra Pomigliano	Acerra	NA	Private	Productive activity				Productive activity	0	448887	4531204
Fiat Auto SpA	3057A503	Via Ex Aeroporto, ASI Area	Pomigliano d'Arco	NA	Private	Productive activity	Groundwater	Carcinogens chlorinated Aliphatic	Implemented Characterisation Plan	Productive activity	2101216	449005	4530887
Aulo SpA	3057A543	Asi Area	Pomigliano d'Arco	NA	Private	Plant with a major accident hazard	Soil/ Groundwater	Metals, Hydrocarbons, Chlorinated Aliphatic	Implemented Characterisation Plan	Productive activity	102400	449262	4529618
Favice SpA - Plant T.A.R.	3057A573	Viale Impero c/o Anio Plant S.p.A.	Pomigliano d'Arco	NA	Private	Waste treatment plant	Soil	Metals	Implemented Characterisation Plan	Waste treatment plant	80	449300	4529418
Consorzio Il Bolo	3057A546	Asi Pomigliano d'Arco Via Strada Comunale del Convento	Pomigliano d'Arco	NA	Private	Productive activity	Groundwater	Metals	Implemented Characterisation Plan	Productive activity	130800	449484	4529824
Se.L.C.A. Srl	3058A510	Via Kennedy	Castello di Stabia	NA	Private	Productive activity				Productive activity	19888	449878	4529888
Romana Chimici S.p.A.	3088A506	Via Kennedy	Castello di Stabia	NA	Private	Plant with a major accident hazard	Groundwater	Chlorinated Aliphatic	Implemented Characterisation Plan	Productive activity	8831	449820	4529670
De Vita Transfer S.p.A.	3057A524	Viale Impero	Pomigliano d'Arco	NA	Private	Waste treatment plant				Waste treatment plant	3587	449308	4528660
P.V.C. Agip n.55348 di Romano Ardena s.n.c	3058A520	Strada O.S. 7 Bis	Castello di Stabia	NA	Private	Fuel service station			Implemented Characterisation Plan	Fuel service station	1200	449801	4529432
Ex Inve	3057A523	Viale Impero	Pomigliano d'Arco	NA	Private	Dismissed activity				Productive activity	15651	449443	4529540
P.V.C. Q8 n.7694	3057A544	Via Mauro Leone 133	Pomigliano d'Arco	NA	Private	Fuel service station	Soil/ Groundwater	Metals and chlorinated Aliphatic	Implemented Characterisation Plan	Fuel service station	1200	449427	4529364
P.V.C. IP Doc Mercurio S.r.l	3057A546	Via Roma Ex S.S.7 (exve 40.945)	Pomigliano d'Arco	NA	Private	Productive activity				Productive activity	70	448967	4529250
Tutano Luigi & C. Sas	3057A529	Via Roma	Pomigliano d'Arco	NA	Private	Productive activity				Productive activity	647	448822	4529144
P.V.C. Q8 n.7129	3057A553	Via Roma 111	Pomigliano d'Arco	NA	Private	Fuel service station	Groundwater	Metals, Hydrocarbons, Ethers, chlorinated Aliphatic	Implemented Risk Analysis, Monitoring	Fuel service station	800	448213	4529084
Ex Mondo	3057A521	Via Principe di Piemonte	Pomigliano d'Arco	NA	Private	Dismissed activity				Productive activity	5492	447840	4529063

Fig. 4.1.2 Work- table Green Mile. Possible sites where to apply the solution

Source: UNINA Team, 2018

Potential impacts:

Restoration of traditional agricultural crops and consequent improvement of the identity of the area; improvement of the employment situation of the local community; possibility of activating territorial labs to promote a circular use of the crop and water involved in the remediation process.





Graphic by Luca Esposito, Unina Team 2019

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Grazie

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