REPAiR

REsource Management in Peri-urban AReas: Going Beyond Urban Metabolism

D5.4 Handbook: how to run a PULL

Version 2

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Acronyms and Abbreviations

CA	Consortium Agreement
CE	Circular Economy
CFS	Certificate on the Financial Statement
DMP	Data Management Plan
DoA	Description of Action
EB	Executive Board
EC	European Commission
ECA	European Court of Auditors
ECAS	European Commission Authentication Service
EIS	Eco-Innovative Solution
EU	European Union
FSIGN	Project Financial Signatory
GA	Grant Agreement
GDSE	Geo-design Decision Support Environment
GF	Guarantee Fund
LL	Living Labs
LEAR	Legal Entity Appointed Representative
LSIGN	Project Legal Signatory
OLAF	European Anti-Fraud Office
PaCo	Participant Contact
PM	Person Month
PO	Project Officer
PULL	Peri-Urban Living Lab
SC	Steering Committee
SP	SharePoint
UB	User Board
UoR	Use of Resources
WP	Work Package

Table of Contents

Publishable Summary

The document contains the methodology of Peri-Urban Living Labs (PULLs), that has been tested in REPAiR pilot cases in the first 18 months of the project.

The aim of the document is to transfer this methodology to follow up-cases and great care is given to the integration with GDSE technologies and other work packages processes and goals.

In order to define the ultimate aim of PULLs, which is the co-creation of Eco Innovative Solutions (EIS) and Strategies, the document summarize EIS definition as a reference for the whole research project.

In particular, the methodology consists of five phases: Co-Exploring, Co-Design, Co-Production, Co-Decision, Co-Governance. In the perspective of a Handbook, each phase is investigated with regards to aims, expected outputs, required management and participatory activities (with links to useful materials), desktop research, use of the GDSE and key lessons learned from the pilot cases. This last part is further investigated in a final comparison among pilot cases, stressing out their place-specificities that have had an impact on respective Living Labs.

1. Introduction

This Deliverable D5.4 “Handbook: how to run a PULL” explains the methodology that guides follow-up cases to run REPAiR Peri-Urban Living Labs (PULLs). It is delivered in the form of guidelines, which are useful to plan, organise and run the PULLs, with specific attention to place-specificity, general context, data, models, and availability of stakeholders inputs.

REPAiR develops, implements and runs PULLs in six European Peri-Urban Areas, utilising the six-question-based methodology of the Geodesign framework (Steinitz, 2012), and integrating, amongst others, material flow analysis, material and territorial resources management, territorial models, and the behaviours of communities.

The general aim of the PULLs is to envision a sustainable development of a region by facilitating the transition towards a more circular economy. REPAiR PULLs constitute both physical and virtual environments, and are located in specific territories with their own policy and governance setting. The participants of the PULLs constitute Public-Private-People-Partnerships (PPPP) (Innovation Alcotra, 2013, p.9). PULLs enable to answer to the following Geodesign questions (Steinitz, 2012):

- How should the study area be described?
- How does the study area operate?
- Is the current study area working well?
- How might the study area be modified?
- What differences might the change cause?
- How should the study area be changed?

Learning from other examples of Living Labs (Ståhlbröst and Holst, 2012; Steen and Bueren, 2017, and so on), REPAiR PULLs combine areas of expertise from diverse fields of knowledge (e.g., landscape architecture, design, industrial ecology, spatial planning, civil engineering, urban planning, ...) and technically diversified competences represented by people, leaders, politics, students, and other relevant local stakeholders’ knowledge), in order to understand the current criticalities as well as to envision future development possibilities in an integrative way. In the PULLs, design professionals, information technologists and scientists give contributions, and support the decision-making process.

REPAiR PULLs include all the activities carried out within the participatory meetings among the local REPAiR partners and the whole consortium, as well as the desktop work that the involved researchers carry out (e.g. mapping exercises). Furthermore, all the relevant stakeholders are involved in the PULL meetings and workshops.

Teaching activities, seminars and dissemination events are an integral part of the PULLs. Moreover, digital interrelations among the partners are part of the activities of the PULLs.

A PULL has five iterative phases:

- co-exploration;
- co-design;
- co-production;
- co-decision, and
- co-governance.

These phases have different aims and therefore different methods are applied to achieve these aims. The five phases and methods are explained in detail in chapter 3. Before that, the general aim of the PULLs, the definition of Eco-Innovative Solutions, their connection to the peri-urban context, their capability to configure potential solutions to the answer of urban regeneration, and the relation of the PULLs to the other WPs, are illustrated to make the handbook understandable as a stand-alone document.

2. REPAiR Peri-urban Living Labs

2.1. Aims of the PULLs

The ultimate goal of REPAiR PULLs is the development of place-based Eco-Innovative Solutions (EIS), and Eco-Innovative Strategies for a better management of material resources and Wastescapes in peri-urban areas, in order to move towards a more Circular Economy, and to activate processes of urban regeneration. The PULLs, as territorial laboratories of co-design, are focused on specific areas assumed as study cases, a significant part of peri-urban zones, for spatial and socio-economic conditions.

To achieve the main goal, the following steps are required:

- **Identification and visual representation of peri-urban territories** in order to define focus areas, samples and their boundaries, for each case study (In cooperation with WP3);
- **Identification of the main objectives and challenges to be explored by the involvement of a network of identified key stakeholders** (e.g. governmental institutions, companies and organisations; in cooperation with WP6/WP8);
- **Definition of the objectives for developing Eco-Innovative Solutions (EIS),** based on the challenges for improving waste cycles and implementing a circular economy; from the viewpoint of WP7 it includes the test of transferability of EIS co-created (see the next step) in the pilot areas, towards the follow-up PULLs - Knowledge transfer event in follow-ups);
- **Co-creation of Eco-Innovative Solutions** developing a catalogue of solutions, and focusing on co-creation processes open to possible implementations via future projects and investments;

- **Provide structure to the co-creation process**, in order to establish clear steps and phases necessary for the duration of the project and beyond;
- **Definition of strategies**, assembling the EIS with reference to the features of the enabling contexts, in order to trigger future local development processes (related to strategic planning, future investments, and so forth).

2.2. Empowerment of stakeholders in the PULLs

The empowerment of participants (local stakeholder and inhabitants) is ensured by promoting the exchange of common and active knowledge in the PULLs about:

- the territorial characteristics of peri-urban regions, (Cooperation with WP6);
- the main issues related to local waste management and Circular Economy;
- the spatial/economic/social/environmental effects of waste cycles and of the generation of Wastescapes, and challenges for implementing circular economy strategies (Cooperation with WP3).

This empowerment enables firstly the definition of operative research contexts, and secondly the current mindset and behavioural change towards a more circular waste management and urban metabolism.

2.3. Relations with other WPs

One of the most important tasks of PULLs is combining work made by the different REPAiR WPs. Since the submission of the project proposal towards the European Commission, and as it is showed in the Grant Agreement (EC, 2016: 142) the interaction among all the WPs is a key point for the project.

The desktop research carried-out in WP3, WP4 and WP6 is integrated with the activities of WP5. PULLs eventually become a unique environment to update research results, and for decision-making testing. This is why the PULLs are characterised by continuous and iterative cycles of activities. One good example is the continuous collective update of the map and legend of Wastescapes, as an enhancement of WP3 spatial analysis (See Co-exploring phase), or the delimitation of key flows considered in function of data-availability.

In the following list, WPs are briefly put in connection with relevant PULL activities.

- WP1 Management: Organise meetings, develop stakeholder contacts, communication;
- WP2 GDSE: Present the status quo, test EIS and strategies;
- WP3 Material flow/Spatial analysis: understanding flows, spatial representations, social issues;
- WP4 Impact/evaluation: evaluating current condition/impact of solutions;

- WP6 Decision models: developing decision models based on WP5 solutions;
- WP7 Knowledge transfer: Sharing knowledge from one PULL to another, sharing experiences and EIS (especially the ones elaborated in the pilot areas);
- WP8 Dissemination: disseminating results from PULLs activities.

Throughout the Handbook, WPs connection are highlighted.

2.4. Definition of Eco-Innovative Strategies and Eco-Innovative Solutions

While the concept of **Innovation**, is firmly established in the economic policy initiatives (EC, 2018 a,b), the concept of **Eco-Innovation** is still in a developmental phase. One of the main distinctions is that Eco-Innovation in addition considers the social and institutional dimensions that are related to the environment. In this sense, changes in socio-cultural rules and institutional structures are guaranteed through a win-win strategy. Thus Eco-Innovation is able to direct strategies to achieve sustainable development and to implement the innovation within an economic framework (OECD 2009; EC 2011; EC 2018 a, b).

According to the 2011 Eco-innovation Action Plan, "Eco-innovation refers to all forms of innovation – technological and non-technological – that create business opportunities and benefit the environment by preventing or reducing their impact, or by optimising the use of resources. Eco-innovation is closely linked to the way we use our natural resources, to how we produce and consume and also to the concepts of eco-efficiency and eco-industries. It encourages a shift among manufacturing firms from “end-of-pipe” solutions to “closed-loop” approaches that minimise material and energy flows by changing products and production methods – bringing a competitive advantage across many businesses and sectors" (EC 2011) (Figure 1).

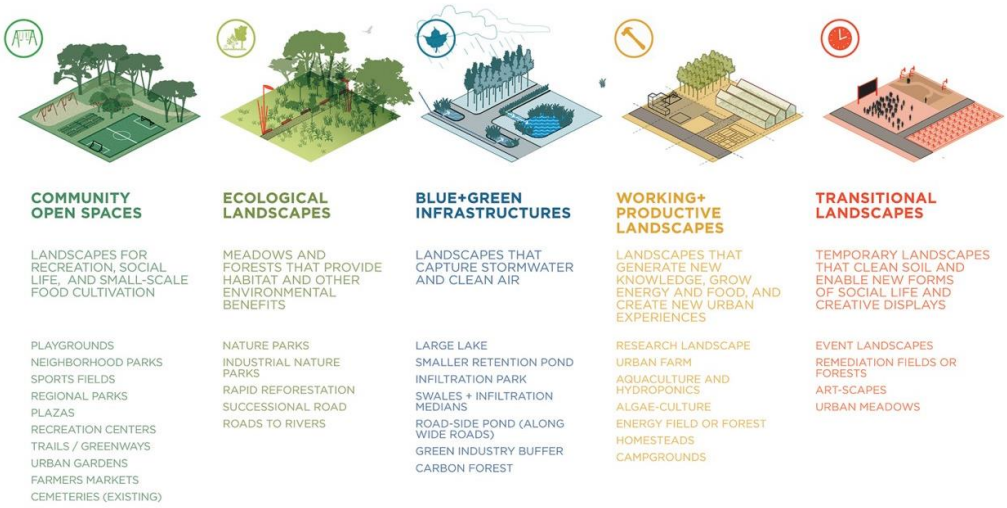

Figure 1: Detroit Strategic Framework Plan is a comprehensive, action-oriented roadmap for decision-making to improve the quality of life and business in Detroit. Retrieved at: http://www.stoss.net/projects/29/detroit-future-city/, last accessed: 27/06/2018

Horizon 2020 REPAiR call "WASTE-6a-2015" stated that "[Eco-innovative solutions are] "Demonstration, at an appropriate pilot scale, and market replication, of integrated eco-innovative cost- and energy-efficient TECHNOLOGIES, PROCESSES and/or SERVICES for waste prevention, treatment, enhanced collection, recycling and recovery of high-grade valuable materials from waste."
Within REPAiR, we have the goal to develop Solutions and integrate them into Strategies. An **Eco-Innovative Strategy** is an alternative course of action aimed at addressing both the objectives and challenges identified within a PULL and develop a more Circular Economy in peri-urban areas.

The Strategy can be composed of a systemic integration of two or more elementary actions, namely **Eco-Innovative Solutions** (EIS). According to the REPAiR Grant Agreement 688920, the "Eco-innovative solutions developed will improve the capacity of urban environments to deal with future resource management challenges, while triggering positive transformations in spatial qualities, sustainability and urban metabolism. These shifts will together enhance quality of life" (EC 2016: 157).

Eco-Innovative Solutions (EIS) will encompass decisions on the following aspects:

- development and implementation of new **materials, technologies** or **processes** in connection with the development of sustainable economic activities, or adding new activities in value chains with the modification of the status of the current waste management systems, and the resource flows, also capable of producing effects on the production of space, either urbanized or environmental;
- modification of existing **policies** and **governance**, or new policy/governance developments;
- definition of **spatial and environmental design** proposals.

These solutions will potentially lead to the modification of existing flows, development of new material flows and processes and/or change the physical design of areas, and will generate change in stakeholders' behaviour, and inhabitants in the case study areas.

Eco-Innovative Solutions (EIS) are creative and smart ideas aimed to innovate and improve a specific and fixed process in relation of the management of waste as a resource and Wastescapes. (Figure 2)

More specifically, EIS:

- **are elementary** responses to **case-specific** problems, in a contextual approach towards innovation, where the real innovation is the process to achieve the result**;**
- **depend on local/regional/national policies/resources** (managerial, economic/financial, administrative capacity, etc.);
- **are the result of a co-creation process implemented in the PULL environments**; depending on multiple stakeholders' needs, as well as including proposal for solutions from experts and all the other individuals involved in the PULLs;
- **cross the multiple scales, the different dimensions and grain** of the peri-urban territories investigated;
- **assure the reciprocities between the natural and the built environment** (EC 2016: 153). EIS are not just changes in current technologies, but also **process innovations** (Dente, Coletti 2011) "contributing to the EU's ambition of a paradigm shift towards Circular Economy and a near-zero waste society" (EC 2016: 153); and
- **are based on the key environmental principle "Reduce-Reuse-Recycle".**

Furthermore, through EIS, a new level of creativity is reached, to face the crisis of waste management and resource scarcity in a backdrop of circular economy, as well as the problems related to regeneration processes of Wastescapes.

In order to facilitate entry and testing in the GDSE, EIS must be classified according to the PESTEL framework following the dimensions that they can take, as:

- Political/organisational (P),
- Economic (E),
- Social (S),
- Technical (T),
- Environmental (E),
- and Legal (L).

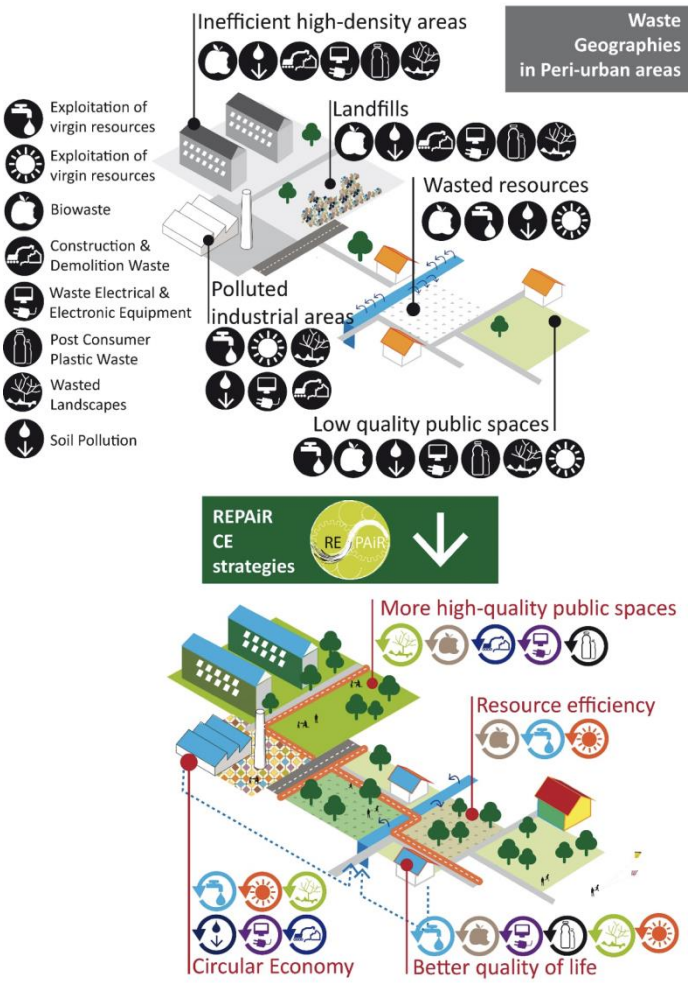

Figure 2: Eco-innovative solutions for Wastescapes in Peri-urban areas.

For more insights on the definition of Eco-Innovative Solutions and Strategies, see also the REPAiR Deliverable D5.1 (REPAiR 2017b).

3. The five phases of the PULLs

The Co-creation process developed within the REPAiR PULLs comprises the following five iterative phases (Figure 3), which were already elucidated in the Deliverable 5.1 (REPAiR 2017 b, Section 3.1, page 29):

1. Co-Exploring;
2. Co-Design;
3. Co-Production;
4. Co-Decision;
5. Co-Governance.

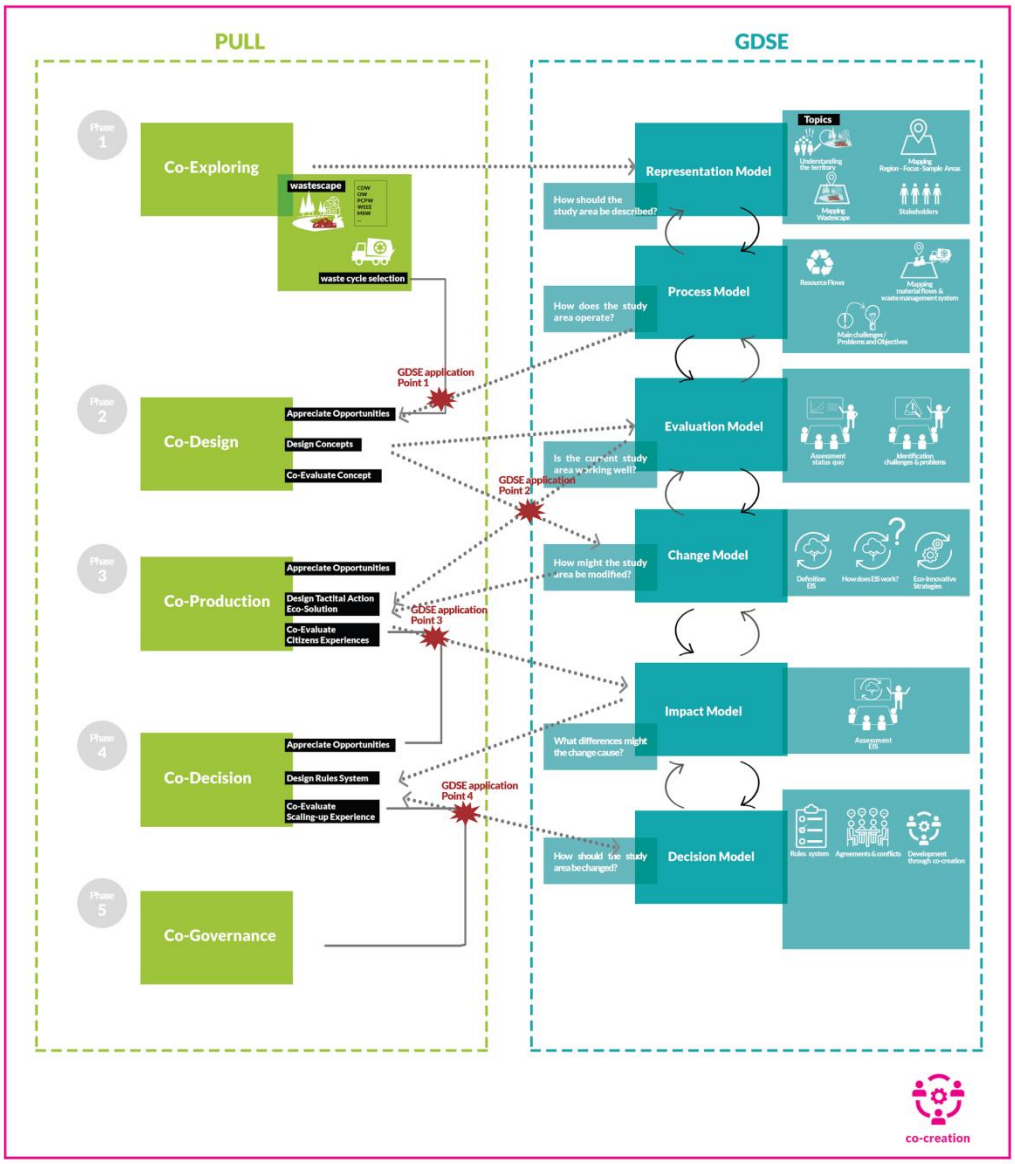

Figure 3: Relation between PULLs methodology and GDSE process. Source: Unina Team

The following chapters present each phase in detail following the same structure:

1. Aim of the phase, expected outputs and results;
2. Required management activities to organise and document the PULL activities;
3. Desktop research and related methods;
4. Participatory activities and related methods;
5. The relation between desktop research and participatory activities;
6. The use of the GDSE (application point) during the specific phase;
7. Examples and key lessons learned from the pilot cases.

Wherever possible, hyperlinks are provided, which refer to all the materials produced so far in the two pilot PULLs. Most of the files are modifiable, to be adapted to the needs of the follow-up cases, using commonly available graphic design software.

Table 1 provides an overview of how the five phases address the six Geodesign questions and are linked with the four GDSE application points. Moreover, table 1 links each phase to a number of topics for organising and planning the work of each specific phase.

For a better understanding, Deliverable D6.4 provides detailed descriptions of the specific work carried on in each pilot case, based on local specificities and related choices.

Table 1: Phases of Pulls (Source: TU Delft/UninaTeam)

PULL PHASES	GEODESIGN QUESTIONS	GEODESIGN PHASES	TOPICS
1 Co-Exploring	How should the study area be described?	**Representation Model**	Common understanding of the territory
			Definition and mapping of Region - Focus, and Sample Areas
			Definition and mapping of Wastescapes
			Definition of stakeholders and experts
	How does the study area operate?	**Process Model**	Selection of key resource flows
			Definition and mapping of material flows and waste management system
			Thematisations of the main challenges / problems and objectives
GDSE Application point 1			
2 Co-Design	Is the current study area working well?	**Evaluation Model**	Assessment of the status quo
			Identification of specific challenges and problems

		How might the study area be modified?	**Change Model**	Definition of EIS
				How does EIS work?
GDSE Application point 2				
3	**Co-Production**	How might the study area be modified?	**Change Model**	EIS and Eco-Innovative strategies
GDSE Application point 3				
4	**Co-Decision**	What differences might the change cause?	**Impact Model**	Assessment of EIS EIS transferability
		How should the study area be changed?	**Decision Model**	Designing rules system
				Establishing and documenting the agreements and conflicts between different interests and groups of decision makers
				How to trigger future local development and influence decision making process through co-creation?
GDSE Application point 4				
5	**Co-Governance**	How should the study area be changed?	**Decision Model**	Delivering decision making models
				Handbook release

3.1. PHASE 1 Co-exploring

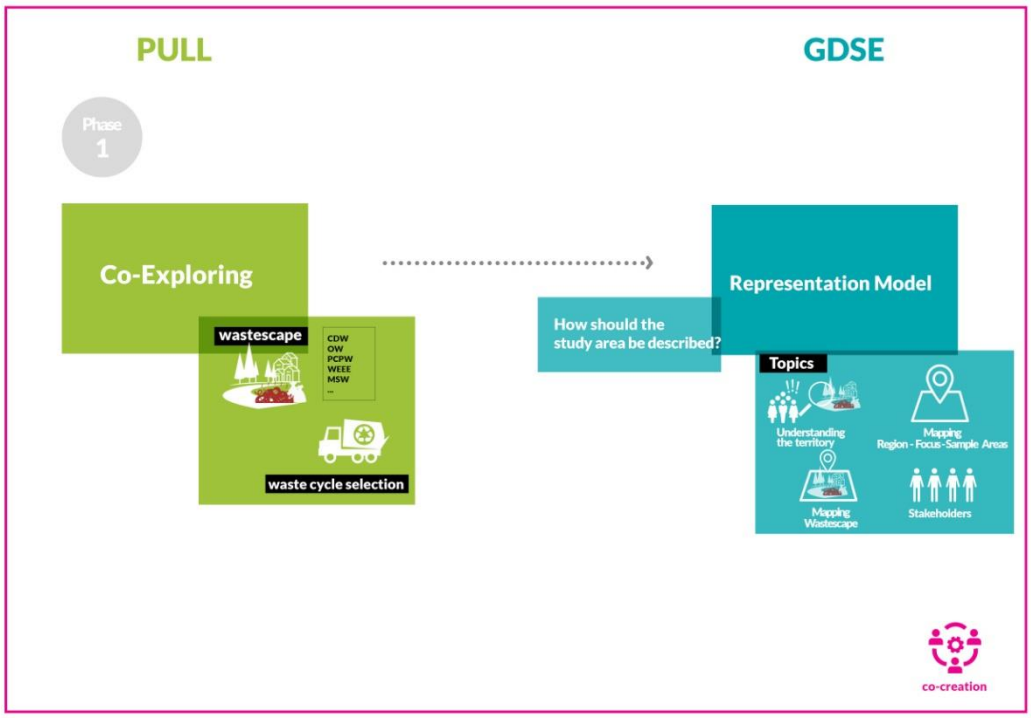

Figure 4: Relation between PULLs Co-Exploring phase and GDSE Representation model. Source:Unina Team, 2018

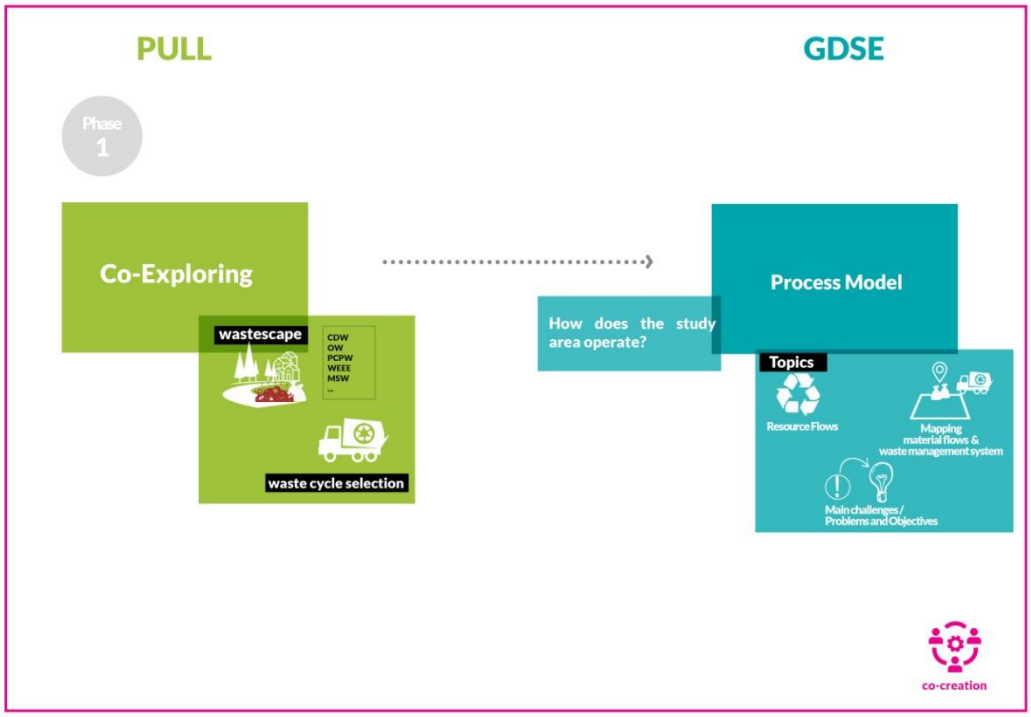

Figure 5: Relation between PULLs Co-Exploring phase and GDSE Process model. Source:Unina Team, 2018

3.1.1. Aim of the co-exploring phase and expected outputs and results

The Co-exploring phase (Phase 1) is composed by the following sub-phases (REPAiR, 2017: 39-43):

- The definition of the State of the Art of the area. Derived primarily from spatial analysis conducted by WP3, this is the summary collection of information related to understanding the study area.
- The Stakeholders' Makeup. Identifying the stakeholders directly related to the waste flows being studied, and utilizing snowball identification to enhance the set of potentially interested additional stakeholders.
- the Flows of the Selected Waste(s). Central to the GDSE are the specific waste flows as understood by the MFA which is able to represent and grasp the spatial and volumetric realities of the study area focus. From here, a first catalogue of potential solutions are developed.
- the Evaluation. This part is split into two main sections: first evaluation of the first solutions in context of the MFA and from there development of an LCA analysis, and then evaluating of the LCA with updates made to the solution catalogue. The addition of the LCA allows for a period of refinement (potentially over multiple meetings) that lead to a final solution catalogue.

In sum, the Phase 1 mainly deals with:

1. the definition and understanding of the study area;
2. the identification of the key stakeholders;
3. the identification of the stakeholders' needs as well as of their key challenges, problems and objectives.

To do so, this phase answers to the two following questions of the Geodesign framework that respectively illustrate the Representation (Figure 4) and the Process Model (Figure 5):

- *How should the study area be described?*
- *How does the study area operate?*

Expected outputs include:

- Spatial flow-related data
- An integrated socio-spatial mapping and understanding of the area
- Definition of Region, Focus Area, and enabling contexts
- Understanding of the resource management related governance system
- A selection of key resources flows
- List of needed stakeholders
- AS-MFA
- Co-development of problem and objective trees
- First catalogue of solutions
- LCA of flow status quo
- Categorization of relevant stakeholders
- A list of prioritised objectives
- Final catalogue of solutions with prioritisation ranking

3.1.2. Required management activities to organise and document the PULL activities

The main activities of the PULLs are:

- PULL meetings;
- PULL workshops.

PULL leaders, with the support of the core group of the team, should organise the PULL workshops starting 2 months prior to the event. Specifically, they must:

- identify one or more specific locations for meeting up in relation with the Focus Area (2 months in advance);
- identify and invite via e-mail or through personal phone calls the key stakeholders (2 months in advance);
- organise the agenda of the meeting/workshop and share it with the participants (preliminary agenda 2 months in advance, send out reminders and detailed agenda 1 week in advance);
- organise workshop materials and print them (a week in advance);
- document the PULL workshops through photos, recordings, minutes and notes, and successively report it in a short and concise report; reporting of the activities carried out in the PULL workshops must be ready within 2 weeks from the date of the workshop, in order to inform stakeholders about the results of the PULL workshops.

3.1.3. Desktop research and related methods

Representation and Process Models for the case study areas are based on a common understanding of the territory. The methodology to define them is articulated in the following steps (also illustrated in the Deliverable 3.3):

A. Definition of stakeholders and experts;
B. Spatial Analysis (Step 1, and Step 2);
C. Material Flow Analysis;
D. Social analysis.

A. Definition of stakeholders and experts

As referenced in the REPAiR project, we use the terms “actor” and “stakeholder” to refer to two distinct groups who have an interest in the project. Generally speaking, an “actor” in anyone who completes an action that affects the result. But the decision-making could be undertaken by a person or group or persons that were not involved in the development process. Therefore, “stakeholders” are those people who have an interest or stake in the project for do not participate in the decision process (REPAiR, 2017c: 34).

The PULL activities involve a mix of stakeholders. The PULL team identifies them following their interests in the project issues (REPAiR 2017b: 45, and WP6 Task 6.1), and answering to the following questions:

- who are the stakeholders involved in the waste and resource management in the area?
- who are the stakeholders linked to the focus areas?
- who are experts on project issues operating on a regional/national/international level?

Further stakeholders can be added later on in the PULL network in order to include (REPAiR 2017a) stakeholders and experts from several fields, and public and private stakeholders. Nevertheless, the choice of stakeholders can be determined from the specific challenges defined in the focus area" (see REPAiR 2017b for more on this matter).

To understand the differences between countries and regions/focus areas a social, socio-economic and demographic analysis is crucial: "Social patterns, and socio-economic and demographic conditions influence the agents' way of thinking (perceptions and interpretations, i.e. concepts), their possibilities, and their way of addressing (i.e. praxes) environmental challenges" (REPAiR 2018a: 9).

B. Spatial Analysis

The spatial analysis aims to unfold the physical complexity of the selected case study areas. It embraces the reading of ecosystems, geographical/topographical formations. It makes use of all available information produced by all available techniques, of a cross-reading of raw data of different nature and an editing to make the underlying logics of the territory legible. The spatial analysis is expressed mainly through maps. Maps are a tool to select, compare, combine, analyse and describe tendencies and the latent capacities of the built environment and its relation to urban metabolism.

Basically, Spatial Analysis includes the following actions, further explained in the following Steps 1 and 2:

a. mapping of boundaries: Region, Large Urban Zone, municipalities and metropolitan city (if present), and of neighbourhoods (census units); (see WP3)
b. identification of Focus Area;
c. definition of the spatial, demographic, economic and environmental criteria and characters of peri-urban areas and mapping them in the Region and in the Focus Area;
d. classification method to map Wastescapes;
e. identification of a smaller scale, namely a 'Sample Area', in which to activate the interaction with the local stakeholders;

f. collection of territorial data (all the data are ordered into informative layers, according to different scales and topics);
g. identification of 'Enabling Context' that is provided to rationalise the links between spatial analysis and Eco-Innovative Solutions, prioritising the interventions in some areas.

Step 1: Definition and mapping of Region, Focus Area, Sample Areas and Enabling Contexts

"Each case-study area definition is unique, in terms of the local context, the subject matter and coverage (thematic and spatial)" (REPAiR 2017b: 38).

Within each PULL the following spatial boundaries must be preliminary identified (in workshops with stakeholders): Region, Focus Area and Sample Areas, Enabling Contexts.

Region

Following the Deliverable D3.1 Chapter 1, Section 1.4, "As Region we understand the administrative region (more than one municipality) of relevance, which means it is on the one hand a relevant governance body for waste management and spatial planning. [...]" (REPAiR 2017d: 9).

Focus Area

The following aspects determine the Focus area:

1. A representative sample of the Region, containing:

a. A mix of urban, rural and peri-urban areas, with a dominant share of peri-urban areas;

b. Wastescapes (in both the meaning of Drosscape and Operational Landscape of Waste, see section 2.1.3);

c. Large infrastructure networks where there is an active interaction between the city and its surroundings;

d. Productive areas and logistic platforms.
2. A problematic "paradigmatic" area; i.e. having the value of a model for investigating the problems and challenges and starting to experiment to develop solutions.
3. Defined based on administrative borders, socio-economic and land cover data as well as on qualitative assessments, where the kind of relationships and movements contributes to identify density gradients of population and uses.

Sample Areas

"The selection and definition of sample areas is based on the cross reading of socio-spatial dimensions, through constant dialogue with local stakeholders within WP5, and on a multi-scale visualisation of the built environment" (REPAiR 2018a: 24).

Enabling Contexts

Enabling contexts are specific locations within the focus area that are more suitable for developing the eco-innovative solutions and strategies.

The systemic juxtaposition of spatial, social and MFA analysis allows to indicate the system of areas (enabling context) in which the experimentations can be more easily applied and where the general process of regeneration can be tested and implemented as of prime importance (REPAiR 2018a: 26).

Consequently, 'The notion of Enabling contexts is applied to rationalise the links between spatial analysis and eco-innovative solutions' (REPAiR 2018a: 8). Hence, 'Enabling contexts' are relevant areas where exploring the development of place-specific Eco-Innovative Solutions (REPAiR 2018a: 184). For further methodological indications, refer to the D3.1 Internal Guidelines (Handbook) (REPAiR 2017d), the D 3.3. (REPAiR 2018a), and moreover, see the Deliverable D5.1 (REPAiR 2017b.

Step 2: Definition and mapping of Wastescapes, an iterative process

As stated in the Deliverable 3.3 (REPAiR 2018a: 13), REPAiR defines 5+1 categories of Wastescapes, following the criteria of decreasing natural values. The 6 categories of Wastescapes listed below are identified as innovative resources to be reintegrated in the metabolic dynamics of the peri-urban areas, to improve the quality of life. Some of these categories could be described and mapped at the scale of the entire focus area; others only at a local scale, thanks to the interactions with local stakeholders within the PULL workshops, following an iterative process. These 5+1 categories are grouped in DROSSCAPES (Berger, 2006) and OPERATIONAL INFRASTRUCTURE OF WASTE (Brenner, 2014).

DROSSCAPES are:

1. Degraded land (W1)
2. Degraded water and connected areas (W2)
3. Declining fields (W3)
4. Settlements and buildings in crisis (W4)
5. "Dross" of facilities and infrastructures (W5)
6. OPERATIONAL INFRASTRUCTURE OF WASTE (W6)

As an example, we propose below the Wastescape map (Figure 6) of the case study of Naples (REPAiR 2018a).

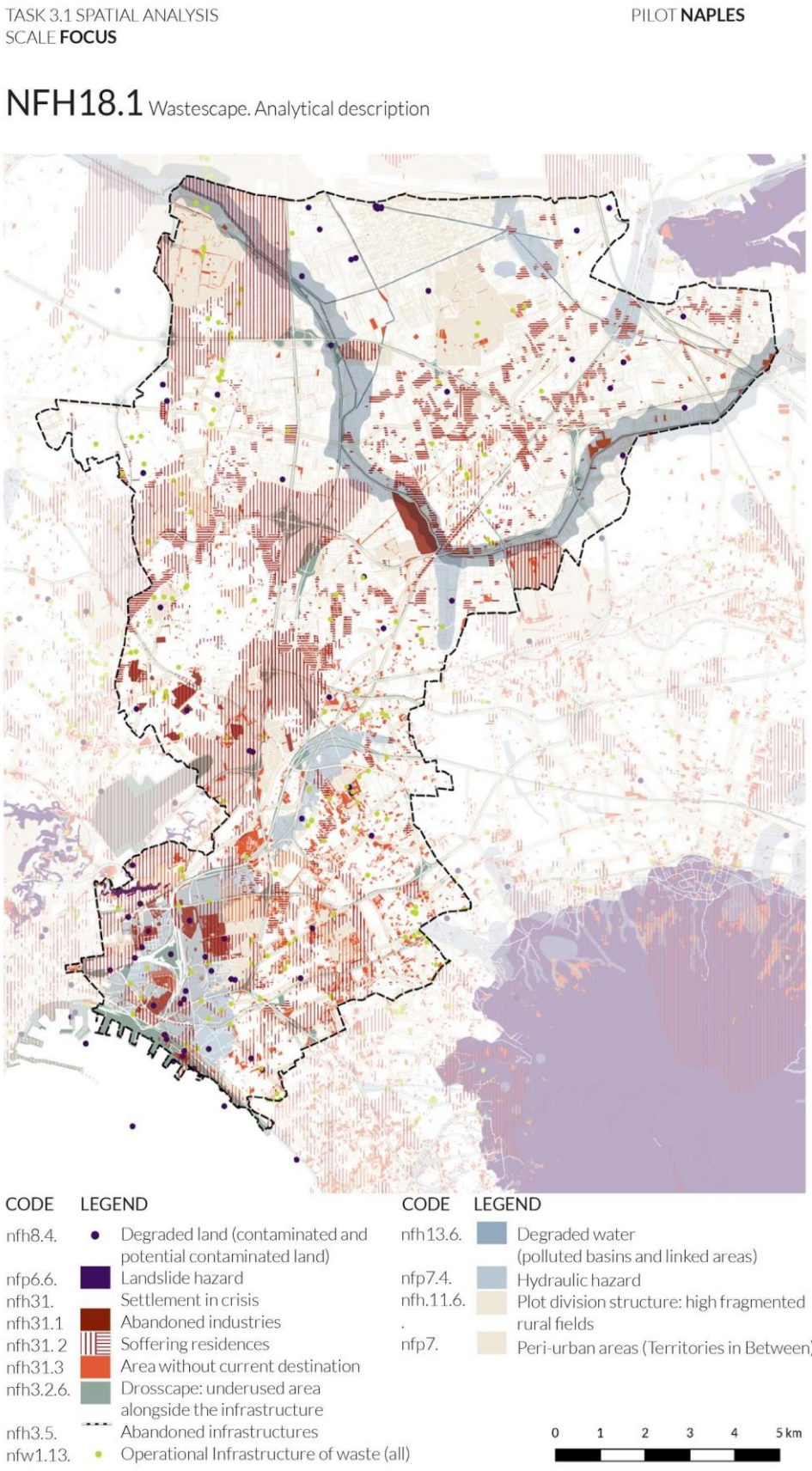

Figure 6: Example of Wastescapes analytical description by Unina Team. Source: REPAiR 2018a.

C. Material Flow Analysis

The activity based spatial material flow analysis (AS-MFA) is in detail described in the deliverable D3.1 (REPAiR 2017d) and D3.3 (REPAiR 2018a).
Three results of the of the AS-MFA are specifically crucial input for the PULL workshops:

1. the determination of the material scope;
2. defining the case specific supply chain;
3. quantification and mapping of waste and material flows.

Nr. 1 is a result of iterations between Desktop Research, dealing with aspects of data availability, and decision needs and priorities formulated by stakeholders in the PULL meetings.

Nr. 2 is direct consequence of Nr. 1 and informs the participants of the PULL, which activities and actors within the Region and Focus Area are involved in the current value chains of the material scope and allows the participants in the PULL meetings to think about and discuss about EIS at the systemic level (Figure 7).

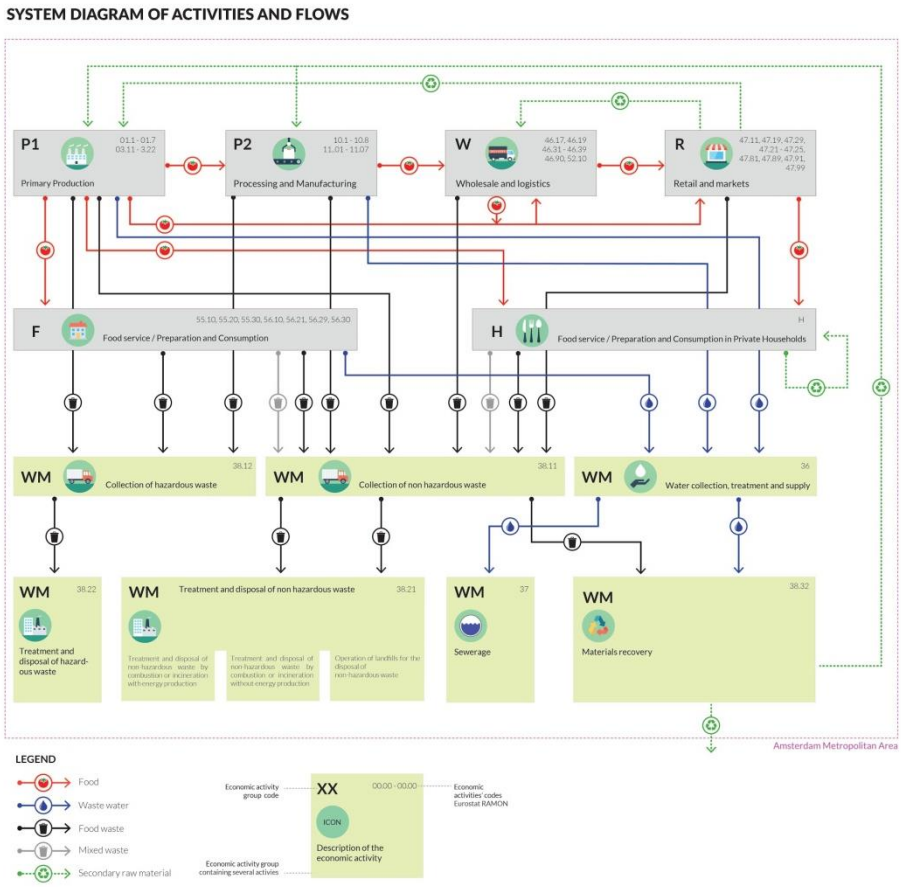

Figure 7: The system diagram depicting activity groups and related flows. Source: TU Delft team.

Nr. 3 adds the necessary spatial and quantified information on actors to the value chains in order to start exploring the possibility for the participants in the workshop to develop EIS which are space as well as actor(s) specific.

D. Social Analysis

As it was described above (Chapter 3.1.3., A), in order 'to understand the differences between countries, regions and focus areas a social, socio-economic and demographic analysis is crucial: "Social patterns, and socio-economic and demographic conditions influence the agents' way of thinking (perceptions and interpretations, i.e. concepts), their possibilities, and their way of addressing (i.e. praxes) environmental challenges" (REPAiR 2018a: 9). The different agents' understandings and behaviours as related to ecological sustainability in general, and waste and resource management in particular, are embedded into certain, collectively accepted, respected and followed social values, norms, rules, conventions, customs and attitudes. Accordingly, these social patterns influence the agents' way of thinking (perceptions and interpretations, i.e. concepts) and way of doing things (i.e. praxes) about environmental challenges. It is important to note that 'agent' in this research refers to both involved stakeholders (decision-makers, experts, experience-holders, managers, beneficiaries etc.) and any member of the general population therefore, the aforementioned hypothesis is assumed to be true with regard to expert and lay knowledge-holders as well.

The different (complex, socio-geographical) pattern of societies determine the development trajectory of them, including the development of and capability for econ-innovation. It means that environmental attitude, environmental awareness can be derived from this patterns and influence the pro-environmental behaviour, not only on policy level, but on household and corporate levels, that further influences the co-creation of an EIS. Namely, environmental awareness or waste-sensitivity of an agent can make easier the co-creation of an EIS. Therefore, co-exploration of the complex social patterns is essential in transfer the PULL methods adequately as well.

The above mentioned social and socio-cultural differences are especially crucial once EIS are travelling from one PULL to another. Once EIS are co-created and listed (in pilot areas), these EIS a selection of transferrable EIS are 'exported' to the follow-up PULLs via EIS card, EIS posters and knowledge transfer events (KT).

In order to select the most suitable potential EIS (from the pilot list) for a given follow-up case, socio-cultural/complex social patterns should be recognised. To do so, process-modells (prepared in WP3) should be read and understood by PULL organisers both from pilot and follow-up cases before the decision is made relating to which EIS should be transferred as a potential EIS to discuss for adoption.

3.1.4. Participatory activities and related methods

Thematisations of the main challenges/problems and related objectives are one of the

main participatory activities carried out within the PULLs.

The selection of Region, Focus Area, Sample Areas, and Enabling Contexts, as well as the outcomes of the MFA influence the identification of:

- local challenges/problems;
- objectives to overcome the current condition.

In Phase 1, to develop a common understanding of the local problems, challenges and objectives and in order to build trust and confidence among the local research teams, the project partners, and the stakeholders, a series of events and seminars should be organised. This is also with the aim to focus on, and to share with the wide public, a preliminary and broad reflection on the topic of Circular Economy in specific local contexts and within local teams to improve the management of waste and of Wastescapes.

All PULLs participants collaborate in the definition of these thematisations. Firstly, they develop the aforementioned mapping exercise of the territories (especially with reference to Wastescapes). Secondly, they work on the thematisations that are useful to develop Problems/Solutions schemes, with the overall goal to define challenges/problems, verify and rank identified objectives.

For each of the waste flow categories, the participants should be asked to rank the verified CE objectives accordingly. The results of this objective ranking generate prioritization of objectives, highlighting the actual priorities for stakeholders. From this outcome, challenges can later be reformulated, in an iterative cycle, and then transformed into objectives.

The effort in this phase should go towards the construction of a common knowledge on theoretical and technical issues, as a basis to empower participants.

Managing knowledge disparity among participants supports stakeholders' proposals, their creative process of design, eventually avoiding the rise of conflicts or, at worse, helping to facilitate solving conflicts arising among actors. If conflicts arise, the PULL-case team has to discuss about them and take action in order to prevent similar conflicts from taking place in the future.

The development of common knowledge should cover the following questions, which should be reiterated in different types of events:

- What are the general challenges and related objectives?
- In which physical, social, technical, and organisational contexts is the co-creation process occuring for developing Eco-Innovative Solutions?
- Who are the target stakeholders and user-groups that need to be involved in this process? How should they be involved?

- What kind of bottlenecks or opportunities can be foreseen for the case study area, considering the existing conditions?

The events can be organised in different moments of time, according to specific local needs and interests, in the shape of:

- **Local Kick-Off Meetings** in order to build trust and create momentum, local research teams should organise initial small events with interested stakeholders, in which current overall goals and specific local ideas are presented. For all partners, these seminars are moments for dissemination to a wider audience.
- **Common Ground Seminars**. This type of (interactive) seminars enables constructing a common understanding of Circular Economy principles and visions towards a better quality of life in the peri-urban areas of the case studies. The main themes, and issues related to the study areas are identified.
- **Specific knowledge Seminars.** Local research teams can organise one or more specific seminars, inviting external experts, to deepen the knowledge about waste flows and resource management. For academic partners, these seminars form a moment of knowledge transfer among each other and among students.

3.1.5. The relation between desktop research and participatory activities

All the results of the desktop research should be discussed, refined and critically questioned in workshops with the stakeholders.

Examples are changes in the list of stakeholders, refinement of the wastescape mapping through local knowledge, or the selection of the focus area and key flows. The use of system diagrams included in solutions sheets, previously designed by the research teams, could help to guide the discussion within the PULLs, guiding the participants to define and design Eco-Innovative Solutions.

3.1.6. The use of the GDSE (application point) during the specific phase

Although not used in the pilot cases yet, it is anticipated here that the follow-up cases can use the GDSE in dedicated workshops in this phase. The programmed GDSE application can be directly reached and used by the following link: https://gdse.h2020repair.bk.tudelft.nl.

The capabilities of the GDSE can be used to show and discuss interactively the status quo (representation and process models), and thereby help to construct a common knowledge among local research teams. Moreover, the GDSE can support small groups of the stakeholders to jointly start developing Eco-Innovative Solutions as well as Strategies.

The GDSE helps to interactively answer questions, such as which are the key actors in a specific value chain, where are they located? What are the amounts of relevant flows

between them, which infrastructures and spaces are they occupying and having an impact on? The GDSE allows to select Activity groups as well as spatial units for selection.

The GDSE also allows to overlay the AS-MFA information with the spatial and social analyses. At application point #1, all functions of the GDSE's "Study Area" section will be available ("Base Data", "Stakeholders"). The step "Flows" in the "Status Quo" section will display detailed data of the AS-MFA concerning the flows and stocks in the status quo. The GDSE's step "Solutions" (in the "Change" section) will also already be available at application point #1 (REPAiR 2017e). The step "Evaluation" (status quo) containing the LCA's results is not available at application point #1.

3.1.7. Key lessons learned from the pilot cases

A. Defining the focus area: As the first line is always the most difficult to draw, the pilot cases have experienced that defining the focus area is an iterative process. In defining the process, the research teams started with the definitions from the research proposal. Henceforth, the areas were discussed with the partners, who had ideas for refining the areas based on specific challenges in (parts of) the areas. The teams also went on excursions to the areas, to experience the larger area and to get more knowledge about initiatives going on. After a series of discussions on this topic, the focus areas were defined. Writing and drawing the argumentation for the focus area definition was crucial, as every time new people joined the meetings, discussions that already were decided on started again.

B. Defining key resources flows, enabling contexts and governance system of the area: The key resource flows to be studied were refined in the first months of the research, based on the aims defined in the project proposal, and on workshops with the partners and user board members. Based on data availability and opportunities to develop innovative solutions, the material flows to focus on were scrutinised and decisions were taken. The WP3 deliverables 3.1, 3.2 and 3.3 and WP6 deliverables 6.1 and 6.3 delivered input for this.

C. Involving stakeholders and experts: After defining the focus area and the key resource flows, the research teams started involving stakeholders and experts. Stakeholders and experts interested/involved in specific parts of the focus area or in specific resource flows were contacted. Longlists were made of the different types of stakeholders, from citizen groups to specialists in i.e. wastescapes, food waste, circular construction, waste treatment, data collection on resource flows or governance and policy issues. Subsequently, contact persons within companies were found and approached. Personally contacting and involving stakeholders took much time, but also led to better involvement of the stakeholders.

D. Identification of problems, and objectives: There were two similar, but different methodologies utilized by the Amsterdam and Naples teams in the pursuit of these

elements. To begin with it, both, WP3 and WP6 defined an initial list of objectives in the focus areas.

In Amsterdam, based on these definitions, a first set of simple challenges were defined on the basis of results from interviews and surveys. The challenges were discussed with stakeholders and experts in several rounds of round-table discussions and PULL-workshops. By asking stakeholders to prioritise the experienced challenges, objectives were developed. In the workshops, participants were asked to draw spatial (wastescape) challenges on maps of the focus areas. Challenge trees were used to define challenges, formulate objectives and directions for solutions. Working in small groups during the workshops (3-5 participants), each guided by at least 1 member of the research team, was necessary to stimulate the participants to draw and write, not only discuss.

In Naples, the problem/objective tree methodology (originally from USAID) was utilized to understand the various problems facing the focus area. These were then verified, and flipped into objectives before undergoing another round of verification. These two passages were undertaken to make sure the initial outputs from stakeholder interviews were accurate, and to provide a verifiable baseline for the MFA and LCA's to come later.

In the following table it is possible to find a detailed description of the PULL Phase 1, with the explanation of the related methodologies and methods utilised. Moreover, hyperlinks are provided, where possible, as a basis material to start from.

PULL Phase		Geodesign Questions	Geodesign Phases	Topics
1	Co-Exploring	How should the study area be described?	Representation Model	Common understanding of the territory
				Definition and mapping of Region - Focus, and Sample Areas
				Definition and mapping of Wastescapes
				Definition of stakeholders and experts
		How does the study area operate?	Process Model	Selection of key resource flows
				Definition and mapping of material flows and waste management system

				Thematisations of the main challenges / problems and objectives

Time frame: from 2 to 6 months

Methodologies:

- Learning by doing (Kolb, 1984)
- PULL meetings and workshops (see this deliverable)
- Integrated spatial, social and material flow analyses (REPAiR, 2018)
- MFA data, steps and considerations (link to the materials)

Methods:

- Surveys and Interviews (REPAiR, 2017a)
- Problem and Objective Trees (link to materials)
- Delphi method (Linstone,Turoff, 1975) (Okoli, Pawlowski, 2004) (Landeta,2006)
- Round table and discussion
- Digital slideshow Presentations
- Mapping Wastescapes (REPAiR, 2018)
- Identifying enabling contexts
- GDSE step 'Study Area'
- System diagrams/Solutions Sheets (link to the materials)

Recommended activities:

- Gathering relevant and available data for the Spatial, Material Flow and Social analyses
- Sharing visions (internal meetings among partners)
- Sharing visions with external experts (external meetings)
- Building trust and confidence among the different stakeholders
- Creating hype (dissemination activities)
- Promoting the participation of citizens and associations expanding the scale beyond the intermediate scale of the focus area to deepen the study in smaller 'sample' areas
- Discussing the preliminary maps of Wastescapes and 'sample' area with local stakeholders
- Discussing the preliminary identification of 'sample' areas with local stakeholders

Cooperation with: WP1, WP3, WP6, WP7, WP8

3.2. PHASE 2 Co-design

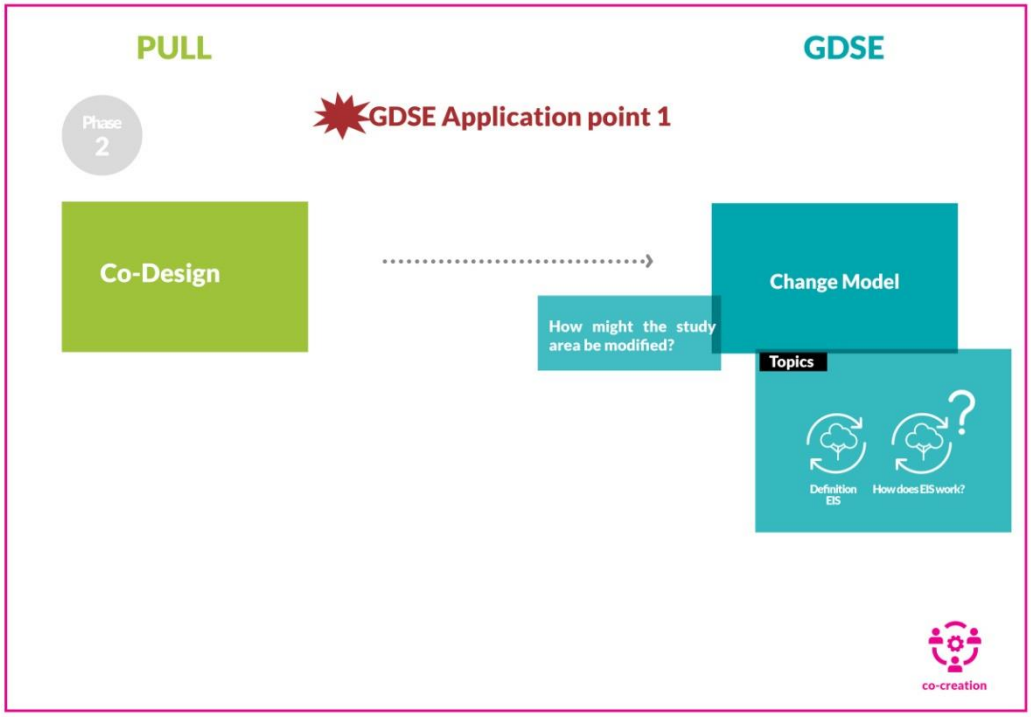

Figure 8: Relation between PULLs Co-Design phase and GDSE Change model. Source:Unina Team, 2018

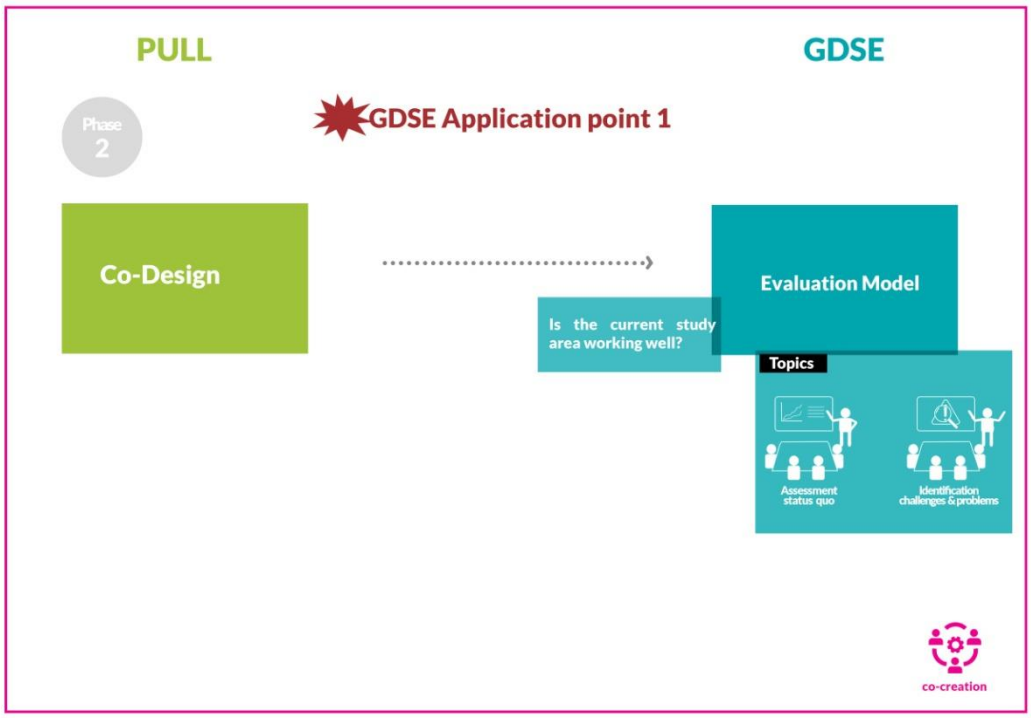

Figure 9: Relation between PULLs Co-Design phase and GDSE Evaluation model. Source:Unina Team, 2018

3.2.1. Aim of the phase, expected outputs and results

Phase 2 mainly deals with the following Geodesign questions, that correspond to the Evaluation Models (Figure 9) and Change Models (Figure 8):

- *Is the current study area working well?*
- *How might the study area be modified?*

The 'Co-design' phase focuses on the analysis and co-evaluation of the sustainability of the current urban metabolism, through the appreciation of opportunities, and through the definition of potential Eco-Innovative Solutions for change models. Therefore, this phase should lead to the development of both Eco-Innovative Solutions (EIS) and Strategies (REPAiR 2017b: 48), to respond to specific local needs, to be tested, assessed and co-developed using the GDSE.

Different local stakeholders help to identify the basic needs that the solution/strategy must have to create innovation.

This process comprises:

- defining the target-user group for the development of the solutions and their important characteristics;
- defining the needs that motivate the users to choose a specific innovation.

These results are achieved by inquiring different stakeholders and user groups about study area characteristics and values, using their competences, everyday practices and visions of the future.

Once the collected data has been co-evaluated in order to generate study area needs, they can be translated into *concepts*. Co-designed concepts must already contain details that let users understand the basic objective of the innovation, but not propose premature solutions.

Phase 2 ends with users expressing their thoughts towards the concepts developed together, aimed at defining any unexplored needs and refining them, in an iterative way, being adaptive to future needs.

The co-design and concept will end with delivering the **First Catalogue of Solutions**. The catalogue presents solutions to the challenges and objectives that were defined in previous phases and PULL workshops (see application point #1 and #2) and by internal research of the case study team members.

3.2.2. Required management activities to organise and document the PULL activities

The main activities of a PULL are:

- PULL workshops;

- Round-table discussions and workshops within the research team and with partners.

PULL leaders, with the support of the research team, should organise the PULL workshops starting 2 months prior to the event. Specifically, they must:

- identify one or more specific locations where to meet, in relation with the Focus Area;
- identify and invite via mail or through personal phone calls the key stakeholders;
- organise the agenda of the meeting/workshop and share it with the participants;
- ask consortium members to prepare an EIS card/poster (2-3 slides with a description of a challenge and its solution) and translate it into the hosting language;
- organise workshop materials and print them;
- document the PULL workshops through recording and notes, and successively report it in a short and concise report;
- develop presentation on the topics of Eco-Innovation and Eco-Innovative Solutions and Strategies
- internally refine the co-design of the First Catalogue of Solutions (see Desktop research activities);
- develop presentation of the First Catalogue of Solutions again to stakeholders.

3.2.3. Desktop research and related methods

Within Desktop research, local teams should be aware of the concepts of:

- Eco-Innovation;
- Eco-Innovative Solutions and Strategies.

They have to develop their capacity to design Eco-Innovative Solutions and Strategies. For this purpose, local teams can carry on desktop research through:

- academic activities (workshops, courses and seminars with local and international students)
- academic research (literature review of published papers, EU documents, participation to national and international conferences, field-trip focused on good practices of EIS)
- REPAiR Consortium meetings, to discuss internally how to develop EIS, which are good examples, etc.

The goal of Desktop research here is to define examples of Eco-Innovative Solutions and Strategies, to show them in PULL workshops with the stakeholders in order to:

1. open the discussion around Eco-Innovative Solutions and Strategies;

2. guide the development of the First Catalogue of Eco-Innovative Solutions and Strategies;
3. refine the co-design of the First Catalogue of Solutions in order to check its feasibility and present it again to stakeholders.

Sustainability assessment of the existing situation (WP4): The current waste management system is analysed in WP4 based on the sustainability framework as developed in D4.4 Definitive framework for sustainability assessment (deliverable still in progress), where social, economic and environmental impacts, both local to global, are quantified and eventually visualised in the GDSE. During the PULL workshops, attendees can easily see the differences in impact for five areas of protection (prosperity, ecosystem health, natural resources, human well-being, human health). The same goes for the selected eco-innovative solutions and strategies.

3.2.4. Participatory activities and related methods

REPAiR aims to define, through a circular approach, Eco-Innovative Solutions (EIS) to improve the capacity of urban environments to deal with future resource management challenges, while triggering transformations in spatial qualities, sustainability and urban metabolism. These shifts will together enhance the quality of life, improving the cultural, environmental and economic values of the case-study areas.

In order to co-design EIS, different techniques can be used within the PULLs. The identification of a “First set of solutions” has the function of aligning the activities of PULLs with the requirements of the GDSE. It can propose a number of possible solutions for a selection of challenges in the study areas, in a framework that will eventually allow the GDSE testing.

The First set of solutions for cases can be identified and developed using different target groups:

- **PULL workshops**, with brainstorming roundtables that are one of the most important settings for co-developing EIS. They incorporate brainstorming, design, critique, and prioritisation within few condensed sessions; EIS - as examples from other case study areas - can be used via EIS card;
- **Teaching and training activities**, such as (elective) student courses, intensive design workshops, and design studios;
- **Consortium Meetings** and other REPAiR partners encounters
- **Field visit** preferably organised as a part of Consortium Meetings.

In order to run an effective PULL workshop, it is advisable to choose one or more facilitators who are comfortable with leading activities to generate ideas, guiding attendees through discussions, and using prioritisation techniques (to build consensus about possible design directions or value features). To guide the brainstorm sessions,

solution sheets and maps were used, which have predefined the minimum required information about upcoming ideas.

PULL is a good platform for transferring EIS (knowledge) into the region where a PULL takes place. PULLs are suitable for learning from each other to establish shared understandings and approaches within the network of participating stakeholders and researchers. Therefore, REPAiR uses co-design workshops to share other case study areas' knowledge (EIS) as well. For this purpose, the presentation of EIS cards (initiated by WP5 team, taken from the catalogue of EIS, if already established, and put in simple PPT format with 1 slide explaining the solution and its context, the 2nd slide with the material flows involved; could be translated in host region's language) should ideally take place on the PULL workshop 2.0. During this workshop, a wide range of possible EIS is elaborated for the host region. It is thus at this stage when inspiration from another region can be particularly helpful in identifying the potential solutions. In these events, guest stakeholders' participation is optional. Posters can be used as a possible EIS for the local stakeholders.

The First set of solutions should show a wide scope, ranging from detailed technical solutions to systemic approaches, and social and political initiatives.

In the period following the identification of The First set of solutions, it is important to embrace desktop research to deepen the solutions and remember the results, which can be further used as input for teaching activities.

Indeed, parallel to the solution developed by stakeholders and in order to test and develop methods of systemic regional design, spatial visions and strategies for the transition towards CE can be developed in university courses.

Field trips/study visits organised as part of consortium meetings are crucial for understanding the milieu where a potential EIS could emerge and be transferred elsewhere. Therefore, the forthcoming consortium meeting organisers are strongly encouraged to arrange such field trips as part of the meetings they host. An important step is also the feedback from the trip participants (guests) towards the host partner about the solutions observed during the trip, potentially with suggestions on optimisation or proposals for more eco-innovative solutions.

A summary of the results is presented on the REPAiR webpage:
http://h2020repair.eu/project-results/research-design-studio/

3.2.5. The relation between desktop research and participatory activities

Eco-Innovative Solutions and Strategies are developed within PULL workshops with the stakeholders, on the basis of presentations made by local research teams.

Under their lead, stakeholders should be encouraged to discuss, refine and critically question EIS examples.

With the same purpose, local research teams should revise the Eco-Innovative Solutions and Strategies, after working on them with the stakeholders.

The result of this design cycle is the First Catalogue of Solutions: a catalogue of examples, resulting from iterative cycles of Eco-Innovative Solutions and Strategies definition.

3.2.6. The use of the GDSE (application point) during the specific phase

Ideally, the GDSE can be used for two aspects during the PULL meetings:

1. Identifying, map out and visualize the key activities and actors in the value chains that should be included into the discussion and development of EIS.
2. Providing an overview of the sustainability evaluation of the existing situations and eco-innovative solutions including which activities and actors contribute most to sustainability impacts.

Both types of information are crucial for the further development of the EIS.

3.2.7. Key lessons learned from the pilot cases

A. Developing objectives: Initial objectives were already defined in the previous phase, but in this phase, the objectives are reviewed and prioritised. This step is done in WP6, in 6.3 for the pilot cases, and 6.4 for the follow-up cases. This is to ensure that a) critical elements have not been forgotten and b) the justification for prioritisation of objectives is both statistically valid and available for use in the later GDSE phases. For these reasons, and with the experience gained from the methods used in the earlier PULL's in both Naples and Amsterdam, the follow-up cases will be utilizing an objective prioritisation and verification methodology we are referring to as a "Soft Delphi" - more details are available in D6.3 (REPAiR 2017c: 29).

B. Developing eco-innovative solutions: Already in workshops, where the research team aimed at defining objectives to respond to challenges in the focus area, the first ideas for solutions were sketched as well. These ideas were used as input for desktop research, again forming input for a next workshop. Student work in the first year of REPAiR, focusing on the two pilot cases, also resulted in preliminary solutions that formed input for the design process. A typical cycle of developing eco-innovative solutions involves the following:

- desktop research, preparing input for a PULL workshop, collecting material developed in other work packages and in students work;
- preparing material according to a suitable format for co-creation: solution sheets, maps, overview of existing solutions;
- brainstorm session at PULL workshops, working with smaller groups that design and discuss solutions;
- reviewing the solutions with the local research team;

- report results of the PULL workshop to participants;
- focus group session with local partners, dividing work and refining solutions;
- repeating the cycle.

After a series of iterations, Eco-Innovative Solutions should be designed such that they can be visualized and evaluated using the GDSE.

One of the most striking lessons learned is that the type of stakeholders joining the PULL workshops has big influence on the type of solutions that are proposed and designed. Whereas citizens and local interest groups focus on accurate, concrete solutions, experts and companies tend to propose systemic solutions, working on the larger scale of policy measures and governance related solutions. This means that the management tasks of organising the PULL meetings are just as important in this phase of the process as in phase 1: to get solutions developed at the preferred abstraction and scale level, it is important to get the 'right' stakeholders and experts to join the meeting.

Another important lesson, is the importance of getting workshop participants to describe their solutions by drawing and writing using the solutions sheets, to make the desktop work of the local research team feasible. If participants have difficulties with drawing and writing while discussing, the local research team should facilitate the process and draw and write for the participants *in real time*.

Working with students is a welcoming addition to the work of the local research team. Through several courses and workshops in the two pilot cases, students were asked to develop eco-innovative solutions. However, although students can be steered in a specific direction, the solutions cannot be expected to be applicable right away. A third valuable lesson is to make time to review and refine solutions developed by students.

The following table shows a detailed description of the PULL Phase 2, with the explanation of the related methodologies and methods utilised. Moreover, hyperlinks are provided, where possible, as a basis material to start from.

A prior list of solutions can be found in D6.4 (REPAiR 2018b) for all case studies.

PULL Phase		Geodesign Questions	Geodesign Phases	Topics
2	Co-Design	Is the current study area working well?	Evaluation Model	Assessment of the status quo
				Identification of specific challenges and problems
		How might the study area be modified?	Change Model	Definition of EIS
				How does EIS work?

Time frame: from 2 to 4 months
Methodologies: ● PULL meetings and worhsops
Methods: ● Focus-group interviews as method for data-collection ● Brainstorming roundtables ● Student design studios (link to the materials) ● Co-design workshops with stakeholders ● International student workshops (link to the materials) ● Digital slideshow Presentation on Eco - Innovative Solution (including EIS taken from other case study areas) (link to the materials) ● GDSE step 'Status Quo'
Recommended activities: ● Promoting student engagement ● Empowerment of local communities
Cooperation with: WP2, WP3, WP4, WP6, WP7

3.3. PHASE 3 Co-Production

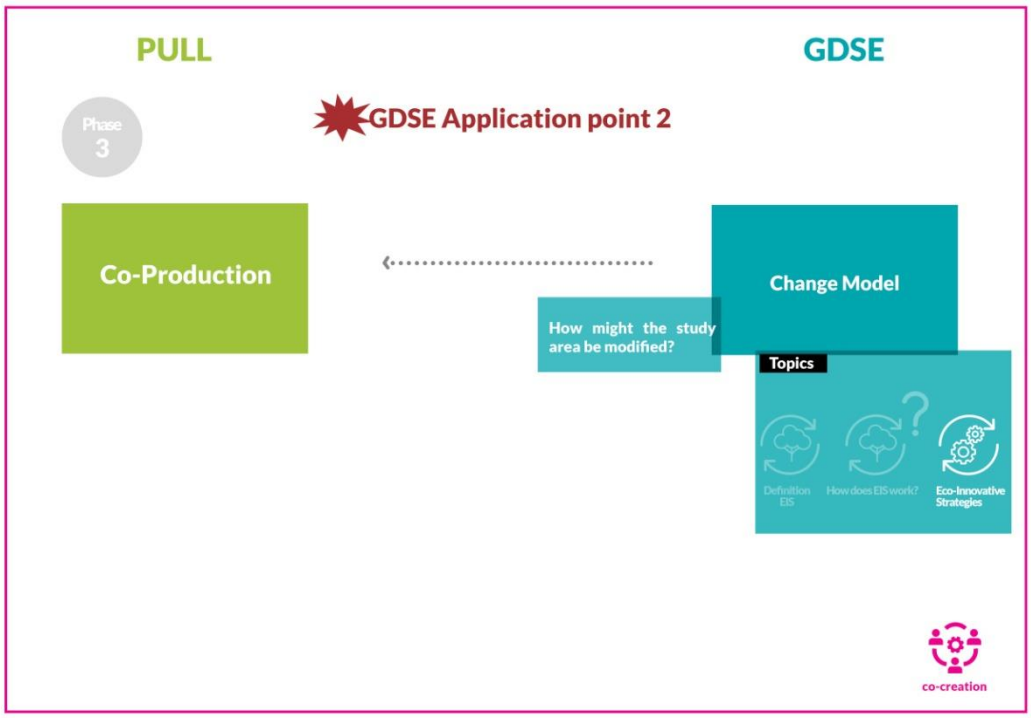

Figure 10: Relation between PULLs Co-Production phase and GDSE Change model. Source:Unina Team, 2018

3.3.1. Aim of the phase, expected outputs and results

Phase 3 mainly deals with the following Geodesign question, that corresponds to the Change Model (Figure 10):

- *How might the study area be modified?*

This phase focuses on co-production of Eco-innovative Solutions and Strategies, using the First Catalogue of Eco-Innovative Solutions, which has been made in previous phases and PULL workshops (see application points #1 and #2) and/or within internal research of the case study team members, refining and expanding its results.

The aim is to move from *concepts* (or first sets of solutions) to specific, operationalised, assessable solutions, with a focus on stakeholders' identified needs throughout the iterative process of GDSE.

The main objective is to look beyond first impressions and to spatialize solutions. Therefore, stakeholders involved in the PULLs are provided with the possibility to implement solutions at specific places and areas within the study area, eventually coming up with specific projects, using the GDSE.

The solutions need to be detailed enough for the stakeholders to envision how the final service/product will look and feel. This leads to the co-evaluation of stakeholders

experiences, that is centred on usability aspects, focused on the interaction between the user and the solutions.

3.3.2. Required management activities to organise and document the PULL activities

The main activities of the PULLs are:

- PULL workshops.

PULL leaders, with the support of the whole team, should organise the PULL workshops from 2 months prior to the event. Specifically, they must:

- identify one or more specific locations where to meet, in relation with the Focus Area;
- identify and invite via mail or through personal phone calls the key stakeholders;
- Inform the REPAiR members (especially WP7/WP8 members) about the events;
- organise the agenda of the meeting/workshop and share it within the participants (including a session for “knowledge transfer event” in relation with WP7);
- organise workshop materials and print them;
- set up the GDSE hardware and software; particularly, prepare input data (stakeholders, initial EIS, spatial layers, key flows and indicators), and the touch-computer so that it can be used during the workshops;
- document the PULL workshops through minutes, recording, photos and notes, and successively report it in a short and concise report;
- develop presentations on how to spatialize Eco-Innovative Solutions and Strategies;
- internally refine the co-production of Eco-Innovative Solutions and Strategies (see Desktop research activities);
- develop presentation of Eco-Innovative Solutions and Strategies again to stakeholders.

3.3.3. Desktop research and related methods

Within Desktop research, local teams should control and check proposed Eco-Innovative Solutions and Strategies feasibility, using knowledge coming from various and specific disciplines. The local research team should develop a catalogue of solutions to present the EIS specific for the case study. In order to get the most feasible Eco-Innovative Solutions and Strategies, local teams should organize:

- **Internal workshops**, with external experts on specific technical disciplines;
- **Teaching and training activities**, such as (elective) student courses, intensive design workshops, and design studios;
- **Consortium Meetings** and other REPAiR partners encounters

- **Knowledge transfer events** as part of workshops.

3.3.4. Participatory activities and related methods

In this phase there is the need to develop the EIS that were sketched in phase 2 towards detailed EIS that can be evaluated in the GDSE. There is a need to confront the generated eco-innovative solutions of phase 2 with the ranked objectives of phase 1 (for each waste flow category), by asking stakeholders to identify to what extent such solutions would help address which objectives. The purpose of this activity is to obtain an overview of which objective and which related solutions are considered important by different types of stakeholders, as well as where there is agreement and disagreement on challenges and solutions.

REPAiR uses the PESTEL[1] framework to illustrate Eco-Innovative Solutions (EIS); that is, taking into consideration the Political/organisational (P), Economic (E), Social (S), Technical (T), Environmental (E), and Legal (L) dimensions that they can take.

In order to achieve positive changes of the status quo, EIS can be developed in a team-work setting on the basis of the previous co-design. In this phase, workshops should be structured around four topics:

- EIS development: Each attendee contributes to brainstorms, developing several individual ideas and further develops these in detail, in order to generate a large set of concepts (see phase 3).
- Present EIS and critique: the PULL team presents its ideas to stakeholders, policy makers, politicians, and the local community, and then has a chance to receive and offer feedback and critique about the different EIS, identifying the strengths and weaknesses of those solutions. In this part of the PULL, the use of GDSE is fundamental to understand both the spatial and quantitative impact of each EIS at the local and territorial level.
- EIS posters (for the EIS chosen for transfer on the basis of the analysis of the scapes) are presented in the PULL workshop 3.0, during which solutions are selected and refined. In order to maximise the potential for transferability we are organising Knowledge Transfer (KT) events at this stage of the PULL process (details below).
- Converge: Together, the group sketches a collaborative idea, making modifications or combining the strengths of several EIS.
- Prioritise: Together, the group identifies common themes or elements and determines which ideas are valuable, and can be implemented and/ or modifies the current territorial visions.

In order to co-design EIS, different techniques can be used within the PULLs, namely:

[1] For a better understanding of the PESTEL analysis see http://pestleanalysis.com/what-is-pestle-analysis/, visited 19 November 2017.

- **PULL workshops**, with brainstorming roundtables that are one of the most important settings for co-developing EIS. They incorporate brainstorming, critique, and prioritisation within few condensed sessions,and include a Knowledge Transfer event as well;
- **Teaching and training activities**, such as (elective) student courses, intensive design workshops, and design studios.

To run an effective PULL workshop, it is advisable to choose one or more facilitators who are comfortable with leading activities to generate ideas, guiding attendees through discussions, and using prioritisation techniques (to build consensus about possible design directions or value features).

Knowledge Transfer events (KT events) are organised within the PULLs. Local REPAiR (project) partners invite the relevant local stakeholders to participate in the workshops. The purpose of these events is to demonstrate transferable solutions (e.g. via EIS card and/or EIS poster), discussing the scope for their adoption elsewhere, including potential modifications to adapt to the 'recipient' region context. A knowledge transfer event, contains group work including different stakeholders from different countries. Practices identified in the different areas will be discussed from the point of view of their suitability for other contexts. Due to timing of the PULL process the KT events have to be different for the pilot and follow-up regions. For pilot case study regions (Amsterdam and Naples), the KT events will be 'export-oriented', that is they will focus on pre-selecting EIS for potential transfer to other regions, through discussion with the stakeholders from the regions present. In follow-up regions, KT events will be both 'import-' and 'export-oriented'. Thus, in these KT events will focus on transferring EIS from the pilot regions (and other following up regions, where relevant and possible).

3.3.5. The relation between desktop research and participatory activities

Eco-Innovative Solutions and Strategies should be developed within PULL workshops with the stakeholders, on the basis of presentations made by local research teams.

Under their lead, stakeholders should also be challenged to discuss, refine and critically question EIS examples.

With the same purpose, local teams should revise Eco-Innovative Solutions and Strategies, after working on them with the stakeholders (iterative cycles).

3.3.6. The use of the GDSE (application point) during the specific phase

Ideally, the GDSE can be used to support two tasks during the PULL meetings:

1. Identifying the key activities and actors in the value chains that should be included into the discussion and development of EIS.

2. Providing an overview of the sustainability evaluation of the existing situations including, which activities and actors contribute to sustainability impacts and where.

Moreover, the GDSE will become a container of solutions and the related input information that allows the research team to assess the impacts of the EIS. The GDSE will also be used as digital repository for the outcomes of the PULL workshops (Figure 11).

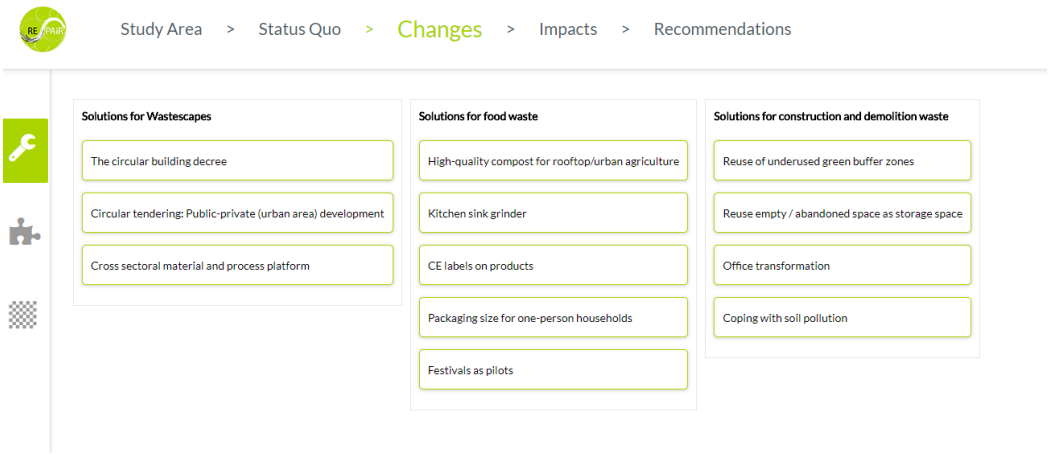

Figure 11: The solution container of GDSE.

3.3.7. Key lessons learned from the pilot cases

This phase has been not implemented yet in the Pilot PULLs.

The following table provides a detailed description of the PULL Phase 3, with the explanation of the related methodologies and methods utilised. Moreover, hyperlinks are provided, where possible, as a basis material to start from.

PULL Phase		Geodesign Questions	Geodesign Phases	Topics
3	Co-Production	How might the study area be modified?	Change Model	EIS and Eco-Innovative strategies
Time frame: from 3 to 6 months				
Methodologies: • Identification and prioritisation of actions • Co-creation sessions and Co-Design workshops for developing Eco-Innovative				

Solutions (EIS) • Knowledge Transfer session to reveal adaptability of EIS elaborated in other regions
Methods: • Involvement of PULL leaders, or PULL participants of the other REPAiR cases in the local workshops • Solutions sheets/cards (link to the materials) • Pre- and post-workshop surveys on objectives prioritization and potential effects of the solutions (link to the materials) • GDSE step 'Changes'
Recommended activities: • Preparing solution sheets to be used in co-creation sessions
Cooperation with: WP2, WP3, WP4, WP7

3.4. PHASE 4 Co-decision

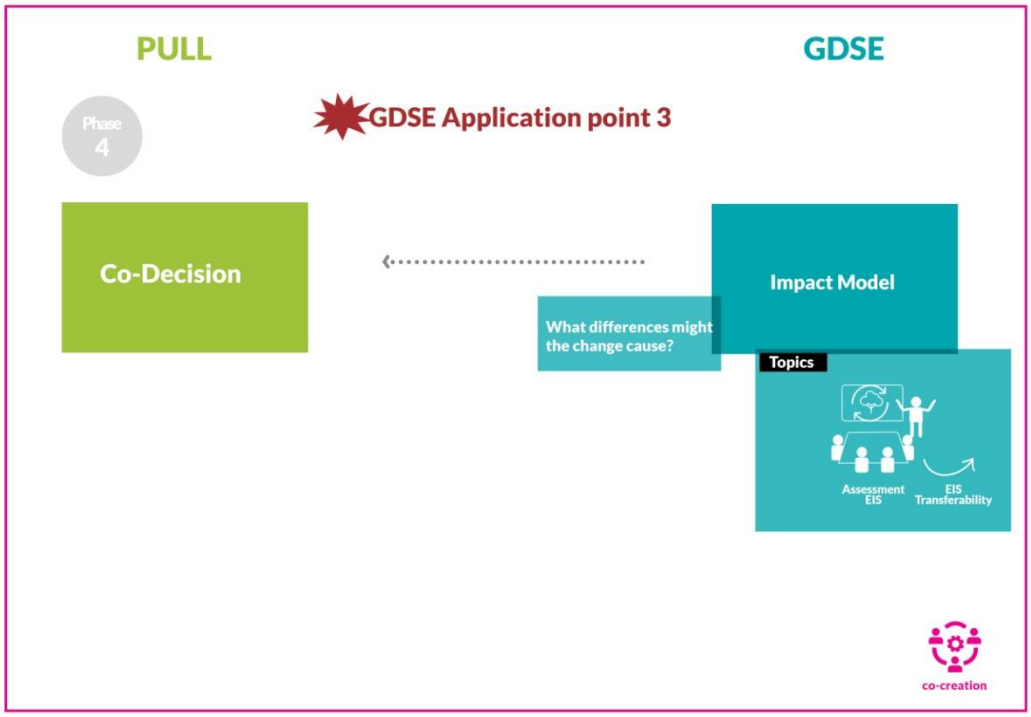

Figure 12: Relation between PULLs Co-Decision phase and GDSE Impact model. Source:Unina Team, 2018

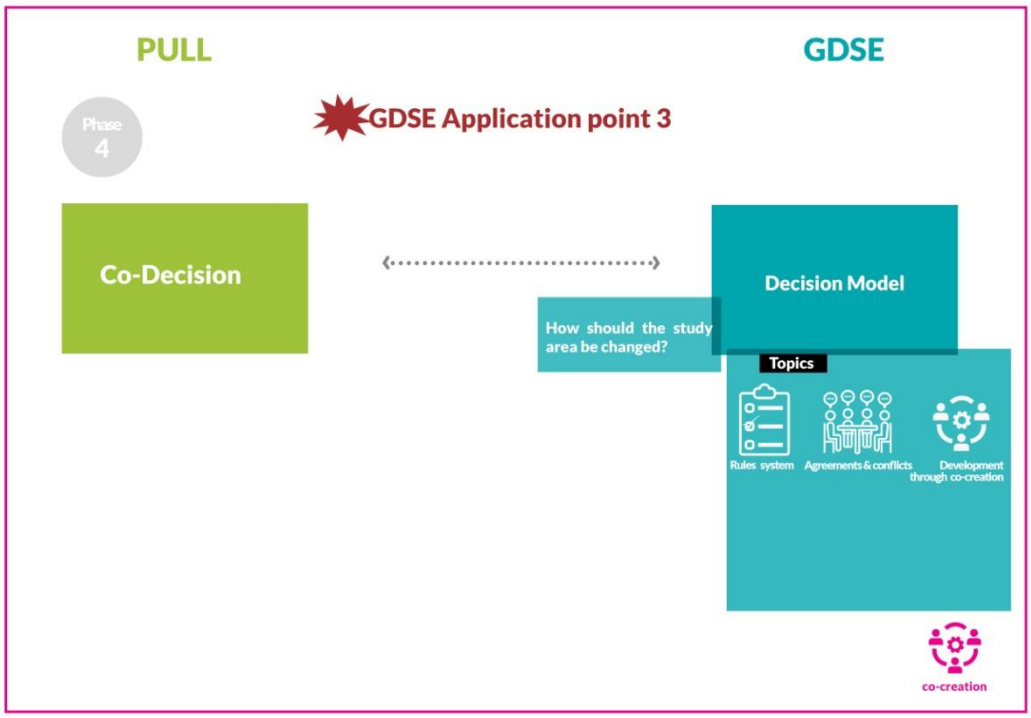

Figure 13 : Relation between PULLs Co-Decision phase and GDSE Decision model. Source:Unina Team, 2018

3.4.1. Aim of the phase, expected outputs and results

Phase 4 mainly deals with the following Geodesign question, that corresponds to the Impact (Figure 12) and Decision Models (Figure 13):

- *What differences might the change cause?*
- *What should in the study area be changed?*

The fourth phase starts by co-evaluating defined solutions, by analysing proposed changes in the selected needs and in the innovation framework.

In this phase, there is no more EIS development. Indeed, REPAiR we will only be able to assess a set of solutions, combined into strategies.

In order to finalise the EIS, the phase will then focus on collaborative-decision making by choosing the Eco-Innovative Strategy (co-produced in application point #3) that best suits the stakeholders' perspectives. This will be done through the prioritisation of the objectives.

PULLs can be seen as environments that can boost collaborative development of Eco-Innovative Solutions. This is because the stakeholders gathered around the table should represent different sectors and share different backgrounds.

In phase 4, the feasibility of EIS and strategies is tested not only in spatial terms (as in phase 3), but also within the regional public programmes and urban planning policies, in order to achieve an improved knowledge of constraints and opportunities.

3.4.2. Required management activities to organise and document the PULL activities

Within Desktop research, local teams should control and check Eco-Innovative Solutions and Strategies feasibility, provided by regional public programmes and urban planning policies coming from stakeholders.

In order to get the most feasible Eco-Innovative Solutions and Strategies, local teams can organise:

- **Internal workshops**, with institutional stakeholders on specific regulations and technical aspects;
- **Consortium Meetings** and other REPAiR partners encounters.

3.4.3. Desktop research and related methods

In this phase, the local research teams and stakeholders explore the opportunities to draw public attention to the EIS, and eventually to understand the chances for influencing the decision-making processes.
Eventually, if the local condition allows the process, and as a potential goal for the PULLs the design of EIS can become a form of negotiation at the local, regional and even national level in each of the case study areas.

3.4.4. Participatory activities and related methods

In Phase 4, the PULL team should use different forms to interact with different kinds of stakeholders (including citizens and citizen associations, companies, local governments and politicians), and to explore the further potentials of the developed EIS, through seminars, debates, roundtables, as well as workshops.

This phase emphasizes both testing and evaluation (impact assessment) of alternative strategies in the study area, directly addressing Geodesign questions 5 (*What differences might the changes cause?*) and 6 *(How might the study area be changed?*).

In order to co-design EIS, PULL workshops constitute the best method to be used within the PULLs. Hence, **PULL workshops**, are run with brainstorming roundtables that are one of the most important settings for co-developing EIS. They incorporate workshop categories “co-production”, which deals with developing strategies on the basis of EIS developed in previous phases, and “co-decision”, which concerns the choosing of strategies for the case study.

The analysis of the opportunities of EIS should put an emphasis on what can go wrong as well as what needs to (or must be) changed and modified in the future. The final findings can be presented in an evaluation report including stakeholders' comments and design suggestions, in order to produce a publishable Handbook in the following phase.

3.4.5. The relation between desktop research and participatory activities

Both the feasibility and implementation opportunities of Eco-Innovative Solutions and Strategies are analysed within PULL workshops with the stakeholders, on the basis of presentations made by local teams.

Under their lead, stakeholders can also discuss, refine and critically question the EIS integration into existing policies and opportunities for further implementation.

As in previous phases, local teams can always revise Eco-Innovative Solutions and Strategies, after working on them with the stakeholders (in iterative cycles).

3.4.6. The use of the GDSE (application point) during the specific phase

The GDSE provides the PULL with the possibility to apply solutions at specific places and areas within the study area under the participation of specific stakeholder groups. Different implementation of solutions can afterwards be combined to strategies. The impact assessment of the solutions and strategies will be made visible to the GDSE users during PULL workshops.

Within deliverable D 2.4 (deliverable still in progress due end of October 2018), Geodesign Workshop Handbook, a more detailed description on how to use the GDSE in this phase will be available. This was planned into the project structure to make sure that the follow up PULLs can start using the Handbook at hand, while the pilot PULLS test the last two phases.

3.4.7. Key lessons learned from the pilot cases

This phase has been not implemented yet in the Pilot PULLs.

In the following table it is possible to find a detailed description of the PULL Phase 4, with the explanation of the related methodologies and methods utilised. Moreover, hyperlinks are provided, where possible, as a basis material to start from.

PULL Phase	Geodesign Questions	Geodesign Phases	Topics

<table>
<tr><td rowspan="4">4</td><td rowspan="4">Co-Decision</td><td rowspan="2">What differences might the change cause?</td><td rowspan="2">Impact Model</td><td>Assessment of EIS</td></tr>
<tr><td>EIS transferability</td></tr>
<tr><td rowspan="2">How should the study area be changed?</td><td rowspan="2">Decision Model</td><td>Designing rules system</td></tr>
<tr><td>Establishing and documenting the agreements and conflicts between different interests and groups of decision makers

How to trigger future local development and influence decision making process through co-creation?</td></tr>
<tr><td colspan="5">Time frame: from 1 to 3 months</td></tr>
<tr><td colspan="5">Materials and methods:
● Co-developing identified solutions (link to material)
● Exploring implementation possibility (e.g. application of Regional funding frameworks; etc.)
● Co-design and co-production workshops
● GDSE steps ‘Changes’ and ‘Recommendations’
● Using the GDSE Tools for the evaluation of the EIS
● Workshop ‘co-production’ and ‘co-decision’
● Co-production and co-decision workshops
● GDSE steps ‘Changes’, ‘Impacts’, Recommendations’</td></tr>
<tr><td colspan="5">Cooperation with: WP2; WP4, WP6; WP7</td></tr>
</table>

3.5. PHASE 5 Co-Governance

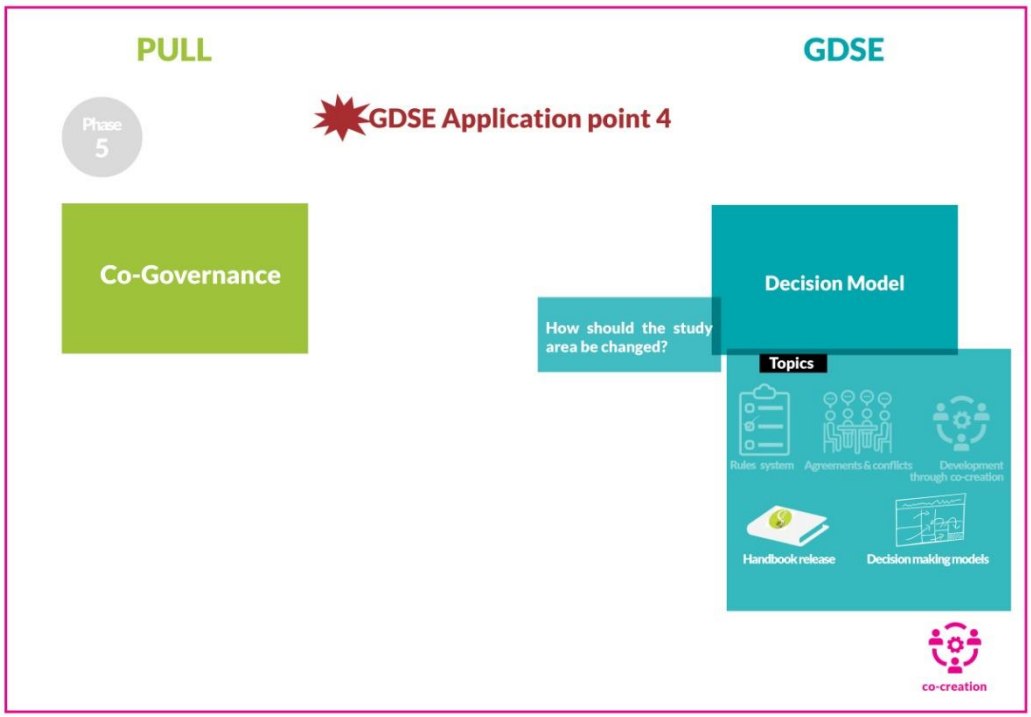

Figure 14: Relation between PULLs Co-Governance phase and GDSE Decision model. Source:Unina Team, 2018

3.5.1. Aim of the phase, expected outputs and results

Phase 5 mainly starts from the following Geodesign question, that corresponds to the Decision Model (figure 14):

- *How should the study area be changed?*

The aim of REPAiR is to develop a decision-making framework, enhancing knowledge and technology transfer among partners.

The final release of the Handbook to follow-up cases will be then followed by an overall release of REPAiR accomplishments worldwide.

In order to enhance the exchange within the REPAiR Consortium and the interaction between local and transnational levels, the two pilot cases, thanks to international events e.g. Consortium Meetings, are able to transfer the knowledge to follow-up cases. The knowledge produced during these meetings helps to clarify the aims of the PULLs and to provide follow-up cases with actual tools for applying co-design in their case-studies.

Furthermore, this final phase comprehends an evaluation approach with the analysis of results, always through an iterative process of Eco-Innovative Solutions test in the GDSE tool that can lead to different solutions.

After the closure of the PULL process, monitoring solutions can help to implement the projects, anchoring them to the existing planning and policies. Moreover, the co-monitoring can influence the existing roadmap, in order to adjust solutions in a collaborative way before the further release of the final Handbook.

The progress of the activities, and the delivery of outputs give feedback points on success, obstacles and needed amendments to the project.

However, the actual decision is not made in the framework of REPAiR: the entire decisional process goes from the identification of the problems in the area, the individuation of objectives, generation of solutions, aggregation of them in strategies, evaluation of these, and the presentation of alternatives with the GDSE software. Each of these steps is supported by decisional steps to enhance transparency and promote participation. The real decision-makers will benefit from these results and take the decision on the strategy to follow once the REPAiR project is ended.

3.5.2. Required management activities to organise and document the PULL activities

Input to this phase is supposed to be a report with the results of the entire decisional process with the support of the GDSE software.

3.5.3. Desktop research and related methods

The decision to take is up to the real decision-makers, and it therefore falls outside REPAiR framework.

3.5.4. Participatory activities and related methods

Participatory activities are up to the real decision-makers. It is anyway suggested to gather experts in order to evaluate the work done in the decisional process.

3.5.5. The relation between desktop research and participatory activities

This section is not applicable in the phase Co-governance because outside of the REPAiR scope.

3.5.6. The use of the GDSE (application point) during the specific phase

The GDSE and its technical documentation will be available for interested parties outside the consortium latest in june 2020. This allows to also incorporate lessons learned from the follow up case.

3.5.7. Examples and key lessons learned from the pilot cases

This phase has been not implemented yet in the Pilot PULLs.

In the following table it is possible to find a detailed description of the PULL Phase 5, with the explanation of the related methodologies and methods utilised. Moreover, hyperlinks are provided, where possible, as a basis material to start from.

<table>
<tr><th colspan="2">PULL Phase</th><th>Geodesign Questions</th><th>Geodesign Phases</th><th>Topics</th></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Co-Governance</td><td rowspan="2">How should the study area be changed?</td><td rowspan="2">Decision Model</td><td>Deliver decision making models</td></tr>
<tr><td>Handbook release</td></tr>
<tr><td colspan="5">Time frame: from 1 to 3 months</td></tr>
<tr><td colspan="5">Materials and methods:
Report of all PULL workshops
Catalogue of strategies
Catalogue of EIS that are part of the strategies
Handbook on how to use the GDSE
Delivering the Handbook to follow-up cases
Knowledge transfer towards follow-up cases</td></tr>
<tr><td colspan="5">Cooperation with: WP6</td></tr>
</table>

4. Case-specific methodologies: Amsterdam and Naples

PULLs within the two Pilot cases of Amsterdam and Naples have been run in parallel, in a real 'learning by doing' experimentations.

They came up quite different one from each other with regards to:

- *participants,*
- *duration,*
- *carried out activities,*
- *number of the events conducted.*

This was especially due to the kind of stakeholders involved. Even if in both cases private and public stakeholders were involved, Naples had to overcome mistrust gap, while Amsterdam could build on a more "circular economy oriented" audience.

That is why there were some place-specific variables in the application of the methodology listed above.

Furthermore, an educational programme in line and integrated with the contents of REPAiR was developed for both Amsterdam and Naples. In Naples the courses and students involved are:

- Third year Urban Planning Course (Urban and Spatial Planning Bachelor Degree) – 25 students;
- Fifth year Urban Planning Course (Architecture Master Degree) – 50 students;
- Thesis dissertation (Architecture Master Degree) – 2 students;
- PhD 1st and 2nd year (Urban and Spatial Planning) – 2 students.

In Amsterdam, this integration meant that members of the REPAiR team were part of studio mentor teams and provided additional methodological input for material flow analyses and systemic design. The courses and students are:

- Fourth year Strategic Regional Planning and Design Course (Urbanism Master Degree) – 80 students;
- Fourth year Urbanism elective course - Geodesign for the CE transition in Metropolitan Regions, for students of the Architecture, Urbanism and Industrial Ecology Master Degrees -15 students.
- Thesis dissertation (Urbanism and Geomatics Master Degree) – 2 students;
- PhD 1st and 2nd year (Urbanism) – 2 students.
-

Amsterdam place-specific methodologies

So far (month 21) the Amsterdam PULL has focused on the first 3 PULL phases, Co-Exploring, Co-Designing and Co-Producing.

- The first 6 months focused on phase 1 and 2. A kick-off meeting and several other “internal” meetings were held with all Amsterdam PULL partners and User Board members, a consortium meeting was hosted, TU Delft consortium members held a field trip, a first course was given to students and a student workshop was organised, and an expert symposium discussing REPAiR general issues was held. All activities in this period contributed to defining the focus area, understand the site specific challenges of circularity, defining the stakeholder in the area, identifying data sources and developing a method for developing EIS .
- In month 13 (6th PULL month), a PULL workshop was held with partners, user board members and local stakeholders, in which the focus area and the main challenges were defined. Following this meeting, the TU Delft researchers developed the challenges into objectives, based on input from WP3 and WP6.
- In month 18, a second workshop was held with stakeholders, developing the first set of EIS. This workshop was first scheduled in month 16, but had to be postponed due to weather circumstances. In this second workshop, also PULL leaders and WP leaders from the other case study areas contributed and knowledge transfer on EIS was addressed.

Currently, the EIS are developed further in a student course and by the research team and partners, aiming at developing operational EIS that can be fed into the GDSE, and based on which the impact can be measured.

Naples place-specific methodologies

The Metropolitan Area of Naples is the Italian case study for the REPAiR project. Here the Focus Area (FA) (Figure 15) is identified in a strategic area if the peri-urban conurbation, where waste flows and Wasted Landscapes characterize the territory. The FA consists of eleven municipalities namely: Acerra, Afragola, Caivano, Casalnuovo di Napoli, Casoria, Cardito, Cercola, Crispiano, Frattaminore, Naples (districts of Poggioreale, Zona Industriale, Ponticelli, San Giovanni a Teduccio e Barra), and Volla (Figure 16). The Focus Area is located at the edges of the compact cities, including the municipalities of the so called ATO area, administrative unit managing waste in Campania. Finally, in the FA there is lack of planning and illegal building activities, giving rise to a territorial ‘fragmentation’ and a low quality of life.

The Naples PULL have been organised including several internal seminars, firstly with experts addressing the specific topic of resource management, in relations with the two main flows (C&D and Organic Waste); later on the PULL wokrshops have been taking place in the different municipalities, giving the priority to the ones more engaged in the project interests, Therefore, the stakeholders more involved in a later stage in the PULL workshops, came from the municipalities that demonstrated a greater interest in the project issues. Very often we mixed the different participation methods (e.g. experts conferences, students’ workshops, stakeholder involvement in

meetings and co-design workshops) in order to achieve a more effective results. This have been happening especially from phase 1 to phase 3.

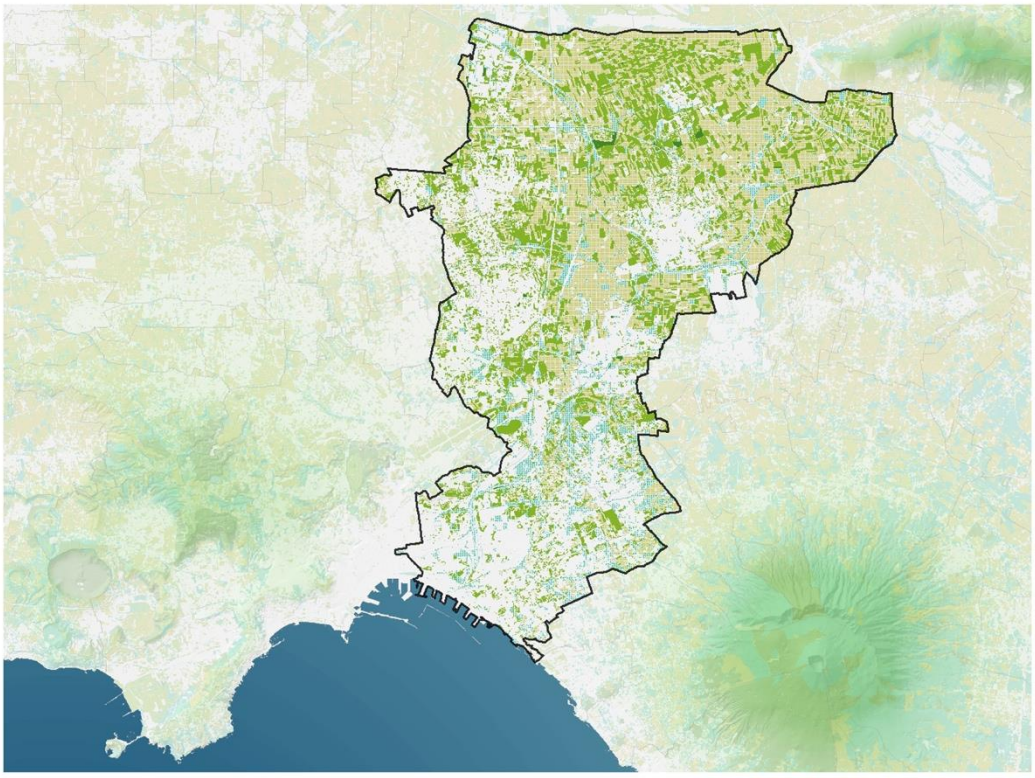

Figure 15: Focus Area in the case study of Naples. Source:Unina Team, 2017.

Figure 16: The eleven municipalities in the Focus Area in the case study of Naples. Source:Unina Team, 2017.

The research has been characterised by an alternation of 'step back' and 'step forward' processes, due to some place-specific characteristics that have influenced the overall project from the start:

- lack of official data about the spatial analysis of the territories, as well as of the resources management; consequently, there has been the need to create a brand-new database and graphics;

- lack of knowledge on the research topics both on the institutional and on the local levels;
- lack of confidence from communities and the private sector towards institutions about developing a collaborative design towards circularity.

These characteristics have originated:

1 - a mixed time-schedule methodology that makes phase 1, 2 and 3 run in parallel, with continuous feedback exchanges from one to the others, in an iterative process;

2 - a building trust/confidence methodology, oriented towards the involvement of public sector as well as private sector and associations; this in particular has seen the use of first meetings just to open up the debate around circular economy topics and the possibilities to change, giving stakeholders the time to metabolise the change of paradigm, before even facing the real aims of the project.

The outcomes of the Naples PULL are at this stage of the project mostly related to the co-design of Eco-Innovative Solutions and Strategies. At the moment, they are about the integration of projects for the spatial trasformation and a better management of waste in peri-urban areas, at an intermediate scale among the one of the city, and of the territory.

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Annex 1 List of PULL workshops so far Naples

The table below shows the PULL meeting and workshops carried on so-far in the case of Naples, and the related methods utilised. For a reference to this Table look at the Deliverable 6.4, p. 27, 28.

Table 2: Overview of activities and methods adopted in the PULL meetings (UNINA team 2018).

PULLS NAME AND DATE	ACTIVITY CONDUCTED	METHODS
PULL M_01_ 10.04.2017	1. Explanation of the REPAiR Project 2. Presentation of the Focus Area (FA) 3. Participants' presentation 4. Debate	1. PowerPoint presentation 2. PowerPoint presentation 3. Sequence of participants' speeches (mayors and representatives of the metropolitan city) 4. Discussion *Mayors and representatives of the Metropolitan City*
PULL M_02_ 31.05.2017	5. Presentation of REPAiR's main objectives 6. Focus on LL methodology 7. Presentation of critical issues on waste in the FA municipalities 8. Debate	1. Speech by UNINA Coordinator 2. PowerPoint presentation 3. Mayors' pecha kucha 4. Discussion *Mayors and representatives of the Metropolitan City, Optimal Territorial Area*
PULL M_03_ 14.09.2017	*Focus on organic waste* 9. Speech by CRA director of eco-bales disposal department 10. Speech by the sole director of ASIA 11. Speech by the president of CRA Waste Observatory 12. Debate to identify problem causes, effects, and solutions	1. Speech 2. PowerPoint presentation 3. Speech 4. Problem tree
PULL M_04_ 21.11.2017	*Focus on Construction-Demolition Waste (CDW)* 1. Introduction by UNINA and CRA 2. Presentation on CDW (UNINA) 3. Round table: - Speech on CDW by ACEN (Neapolitan Builders' Association) - Speech on how is Regional Waste Register organised (CRA) - Speech on the role of the Waste Observatory by the president of CRA 4. Debate	1. Speeches 2. PowerPoint presentation 3. Round table 4. Discussion *Mayors and representatives of the Metropolitan City, enterprises, representatives of the Neapolitan Builders' Association*

Table 3: Overview of activities and methods adopted in the PULL workshops (UNINA team 2018).

PULLS NAME AND DATE	ACTIVITY CONDUCTED	METHODS
PULL W_05_14.02.2018	*Focus on wastescapes. Sample area, 5 Municipalities.* 1. Introduction by UNINA coordinator 2. Presentation of the Waste Management in the 5 Municipalities (CRA) 3. Participants' round presentation and their individuation of a wastescape (facilitated by UNINA) 4. Individual Work on wastescape form / Localizing wastescapes /WS) on the map 5. Speech on the categories of wastescapes by UNINA team 6. 2 parallel worktables on wastescapes	1. Speech 2. PowerPoint presentation 3. Round presentation 4. Filling the form and localizing the WS on the map (post-it) 5. Synthetic speech to orientate the public within categories of wastescapes 6. Parallel focus groups on the WS map to update it *Groups, associations and Municipalities directors or councillors* *Participation of RKI PULL leader*
PULL W_06_07.03.2018	*Focus on wastescapes, Sample area, 5 Municipalities.* 1. Report of 5th PULL (UNINA + 2 leaders) 2. Speech on what an Eco-Innovative Solution (EIS) is (UNINA) 3. Speech on EIS coming from agricultural policies (CRA) 4. Participants' round presentation and their suggestions on EIS 5. Division in groups and identification of 3 EIS to work on	1. Speech 2. PowerPoint presentation 3. PowerPoint presentation 4. Round presentation 5. Work group 6. Speech *Groups, associations and Municipalities directors or councillors*
PULL W_07_28.03.2018	1. Report of 6th PULL and programme of work (UNINA) 2. 1st interaction in the 3 worktables on EIS / problems-objectives-actions 3. Report of the 1st interaction by worktable leaders 4. 2nd interaction in the 3 worktables on EIS / Individuation of actions and their prioritisation	1. Speech 2. 3 parallel focus groups 3. Speeches 4. 3 parallel focus groups (assessment of the short, medium and long term actions) 5. Discussion *Groups, associations and Municipalities directors or councillors* *Participation of AMA PULL leader*
PULL W_08_23.04.2018	*Focus on wastescapes, Sample area, 5 Municipalities.* 1. Speech on constraints and opportunities coming from public programmes and policies (CRA) 2. Discussion 3. Interaction in the 3 worktables on the proposed actions to carry out the site specific project / what to do, with whom?	1. Speech 2. Discussion 3. 3 parallel focus groups (filling the form on actions)

Annex 2 List of PULL workshops so far Amsterdam

The table below shows the PULL workshops carried on so-far in the case of Amsterdam, and the related methods utilised.

For a reference to this Table look at the Deliverable 6.4, p. 16.

Table 4: Overview of activities conducted and methods used in the PULL workshops and meetings, Amsterdam (TUD Team 2018).

PULLS NAME AND DATE	ACTIVITY CONDUCTED	METHODS
Internal kick-off meeting, 31 August 2016	meeting with Dutch partners and user board members	brainstorm session
2. Consortium meeting Amsterdam, 3-4 November 2016	first ideas of area definition and challenges	workshops
Internal meetings with partners (every 2 months), January 2017 - July 2017	area definition, data collection, definition of stakeholders and challenges	brainstorm sessions
Stakeholders interviews (deliverable 6.1), February 2017 - April 2017	defining stakeholder challenges/objectives	semi-structured interviews, literature reviews
1st AMA PULL Workshop, 12 September 2017	challenges/objectives exploration/identification	Soft-Delphi (note cards, challenge trees)
Internal meetings with partners (every 2 months) September 2017 - May 2018	objectives definition, first sketches EIS	brainstorm sessions, literature reviews
2nd AMA PULL Workshop, 19 February 2018	objectives verification, prioritisation (individual ranking during Pull), EI-	survey (start Pull), Ranking overall objectives with excel calculations (after Pull), EIS