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Habitats and harbours for sustainability experimentation in Europe

Harm van den Heiligenberg, Gaston Heimeriks, Rob Raven, Marko Hekkert, Copernicus Institute of Sustainable Development, Utrecht University, The Netherlands.

Abstract
Sustainability challenges require experimentation and learning with various types of sustainability innovations. Local and regional context conditions, to which we refer as 'habitat' are likely to shape the potential scaling-up of these experiments towards a wider regime change. Upscaling may unfold through various pathways. In this paper, we are particularly interested in the succession of experiments from one location to another location. Our main proposition is that we expect that such a succession is more challenging when an innovation travels between regions or countries with non-similar institutional, economic and political contexts, because of the substantial translations and re-embeddings required.
We address the following research question: What are regional conditions for transferring and translating sustainability experiments to other locations and regions? We use transition, regional innovation and policy mobility literature to develop a conceptual model. As such, we propose that regions favourable for sustainability experimentation need: (1) an adequate habitat for experimentation; and (2) a supportive harbour for transferring and translating the innovation to other locations and regions worldwide. A harbour may be regarded as a characteristic of a departing and a receiving region. It may have both a physical appearance (such as a real harbour) as well as a social appearance (e.g. a culture of openness).
We carried out a comparative case study in four contrasting city-regions to capture the diversity of experiments and habitats in Europe. We found a large diversity in succession pathways. These pathways include travelling through inter-city and campus networks, through global sectoral platforms, through conferences and events (where people meet belonging to the same counterculture) and through the travelling of skilled people. Exact replication does hardly happen, i.e. the innovation is not copied to the new location. Often the innovation is 'translated': either only a part of the innovation is traveling, or only the conceptual idea behind the innovation is traveling. An adaptation of the innovation to the new local context is often needed.
Preliminary results suggest that these various succession pathways require distinct harbours in the departing region. We found a mix of physical assets (universities, airports, conferences), membership of networks, the availability of skilled actors (involved in transfer and learning) and cultural conditions, such as open-mindedness and an open-source mentality.

1. Introduction

- Sustainability challenges require experimentation and learning with various types of sustainability innovations. The so-called habitat has a distinct experimentation pattern and contains favourable context factors for experimentation. These factors are deeply embedded, both locally and regionally. In earlier research we have developed various habitats, such as the "Valley habitat" and the "Do-it-ourselves habitat" (van den Heiligenberg et. al, 2018)
- For a sustainability transition the phase of experimentation should be followed by an upscaling process towards a wider regime change. Upscaling may have various dimensions, e.g. quantitative, geographical, or functional ((Jolly, Raven, & Romijn, 2012). We are especially interested in the various geographical pathways for the succession of experiments. For instance, we are interested in the succession of an experiment in a "Valley habitat" versus an experiment in a "Do-it-ourselves habitat". What would be a favourable pathway for their succession?
- Experimentation and upscaling of sustainability innovations may have opposite requirements. A major difference may be that experimentation requires a protected space (Smith & Raven, 2012), and upscaling requires openness to the outside world (Bathelt, Malmberg, & Maskell, 2004).
- In this paper we are interested in the first step in upscaling, i.e. the *succession* of sustainability experiments. An experiment may be followed by another experiment, either on the same location or by a transfer to another location worldwide. We conceptualise this transfer as the first step of the upscaling process. The diffusion of innovations follows trajectories of niche accumulation (Raven, 2007). This may lead to a larger number of experiments which may challenge the regime at various locations, each within a specific spatial context (ref?).
  We introduce the harbour concept to address the favourable regional characteristics enabling this transfer. A harbour is defined as a regional provision that enables the transfer of experiments to other locations. A harbour may for instance have a physical appearance (such as a real harbour), or may be used symbolically (e.g. a culture of openness).
- Our main proposition is that such a transfer is more easy when an innovation travels between similar habitats or regions, i.e. with a similar institutional, economic, political and cultural contexts, because of the reduction of translations and re-embeddings required (Peck & Theodore, 2001). However, we assume that a transfer is never a simple copy and paste process; translation is always needed
- Current transition research has a main focus on experimentation and how they may scale up towards regime change, but only sparsely address the transfer and translation of experiments into new spatial contexts (Williams, 2017). Wieczorek et al. (Wieczorek, Raven, & Berkhout, 2015) introduce the concept of the transnational linkages. These linkages show what actually can travel. We build on this linkages and analyse the transfer mechanisms in detail, to find the enabling provisions in the departing region.
- Our research question is: What are favourable regional conditions for the succession of sustainability experiments, on the same location or by transferring and translating sustainability experiments to other locations and regions?
- We believe that our research question has an important societal relevance. Regional stakeholders are often interested in the scaling of their sustainability innovations to

other regions. At the moment there is however hardly any scientific insight available in how these processes may be enabled.

2. Theory

2.1 Conceptual framework

- We use transition, regional innovation and policy mobility literature to develop a conceptual framework for the succession of sustainability experiments, based on three building blocks: similarity, linkages and harbours
- Our first building block is the assumption that the more **similar** the departing and receiving locations are, the easier it will be to transfer the experiment (Mccann, 2016). With a similar institutional, economic, political or cultural contexts, less translations and re-embeddings are required (Peck & Theodore, 2001).
- Based on this assumption we distinguish three kinds of succession with a varying degree of similarity (Jolly et al., 2012).
    - Succession to same context: same location, same habitat, same region, same actors. Regional expansion describes a specific situation, where an experiment is followed by a new and often larger experiment, on the same location. The spatial context is the same, and the actors involved are often the same .
    - Succession to similar context: diffusion towards a similar context: a different habitat in the same region or a similar habitat in a different region, other actors. The innovation may travel to another location in the region, or may travel to a similar context in another region, (such as a travel from a Science Park milieu to another Science Park milieu).
    - Succession to non-similar context : diffusion towards a non-similar context: different habitat in different region, other actors. In this case the innovation arrives in a new context, with a different institutional, economic, political and cultural situation.

  Geographical distance may be important for the succession, however we conceptualise the geography in a relational sense. It may be more easy to transfer an experiment to a similar region over a long distance then to transfer to a non-similar region nearby.
- The second building block is formed by the **linkage**. The linkage describes what actually travels. We use the transnational linkages concept of Wieczorek et al. (Wieczorek et al., 2015). They mention five linkages: actors, knowledge, capital-related, institutions and technology. Besides the technology we add social innovations, and we discriminate between codified and tacit knowledge, since codified knowledge may be easy to transfer to a subsequent experiment.

  However, this transfer is not a simple copy-and-paste process. The form and function of innovations changes as they are translated and re-embedded between different institutional, economical, political and cultural contexts. (Peck & Theodore, 2001; Williams, 2017). During the travel, a de-contextualisation and re-contextualisation occurs. What actually travels is the “global form” (Williams, 2017).
- We consider networks (such as intercity or interregional networks) as the carriers of the linkages (Wieczorek et al., 2015). Existing networks may enable the transfer of innovations. Networks may be loosely or tightly coupled (Boschma, 2005). This may influence the transfer.

- The third building block in our conceptual framework deals with the departing region. We are interested in the regional **harbours**, i.e. the favourable regional conditions that facilitate the succession of experiments. We selected candidates for harbours from the existing literature[1].
- We extend the concept of the transnational linkages by assuming that a linkage may be realised by another actor in the same region. For instance a university may have a knowledge linkage with other universities. This linkage may enable the transfer of an innovation from another actor in the region
- We are interested in the dimension "isolation versus openness". Is this dimension the main shift in the required spatial context factors between "experimentation" versus "succession"? From the literature we learn:
    - The strategic niche management literature deals with sustainability experimentation. In this literature is emphasised that temporary Isolation is needed for the nurturing of these niches. It requires a passive (remoteness, counterculture) or active (policy) shielding for reducing the harsh mainstream selection pressures. There are also some articles in the RIS literature on nursery and incubation processes.
    - The RIS literature focuses on regional innovation. These systems require openness in various forms, for instance the pipelines, i.e. open knowledge flows (Bathelt et al., 2004), accessibility, centrally located, open-minded and open-source. However there is a possibility that innovations in their early stage may be to weak to survive in a very open environment.
    - Sustainability innovations may require more shielding then economic innovations. A main difference is that sustainability innovations often do not a relative advantage for the user (Rogers, 2003). There might be an advantage for the society in its entirety, but not for an individual consumer (Hekkert & Ossebaard, 2010).
    - A core question is this discussion is if It is possible for innovations to travel from protective space to protective space, with an open knowledge linkage?

We finalize this section with an overview of "Linkages and Harbours" from the literature (See Table).

[1] We would like to thank Jonas Torrens for the valuable discussions in developing the harbour concept.

T*able: Linkages and harbours*

Transnational linkages	**Additions from literature**	**Examples of harbours**
Actors. People carrying knowledge	Skilled actors. Traders. Size of cities/regions	• Accessible hub at a crossroads location • Physical harbour/airport • "temporary proximities", such as Trade fairs, conferences, festivals (Bathelt et al., 2004). • Membership of sectoral, intercity and interregional networks
Knowledge. Tacitly held by people, or carried in a codified form	Global pipelines, local buzz and regional gatekeepers who act as a broker (Morrison, 2008). Difference between knowledge and know-how (learning by doing)	• Knowledge hub, Meeting point. • Universities and other "gatekeepers" (Morrison) • Open-mindedness • Open-source • Membership of sectoral, inter-city and transregional networks.
Capital. Foreign investments may generate tech. spillovers		• High GRP/cap. • Foreign investors
Institutions. E.g. environmental standards diffused by global firms	Reputation of the actor or region	• MNC with branches. • Media. • Membership of sectoral, inter-city and transregional networks
Technology. The diffusion of equipments, products	Add social innovations (= tacit; may require other harbours). Legitimacy of the innovation.	• Accessible hub at a crossroads location • Physical harbour/airport • Membership of sectoral, inter-city and transregional networks

2.2 The combination of habitats and harbours

- We suggest that the various types of sustainability experiments show various geographical pathways for the succession of experiments.
- In earlier research we constructed a framework with four habitats. Each habitat contains favourable context conditions for a distinct type of experiments: the Valley

habitat, the Middleground habitat, the Makerspace habitat and the Do-it-ourselves habitat (see Fig. 1). The factors that shape experimentation are mostly manifest at the local and regional scale.

- We are now able to enrich this framework with hypothetical succession pathways and harbours (See Fig. 1).

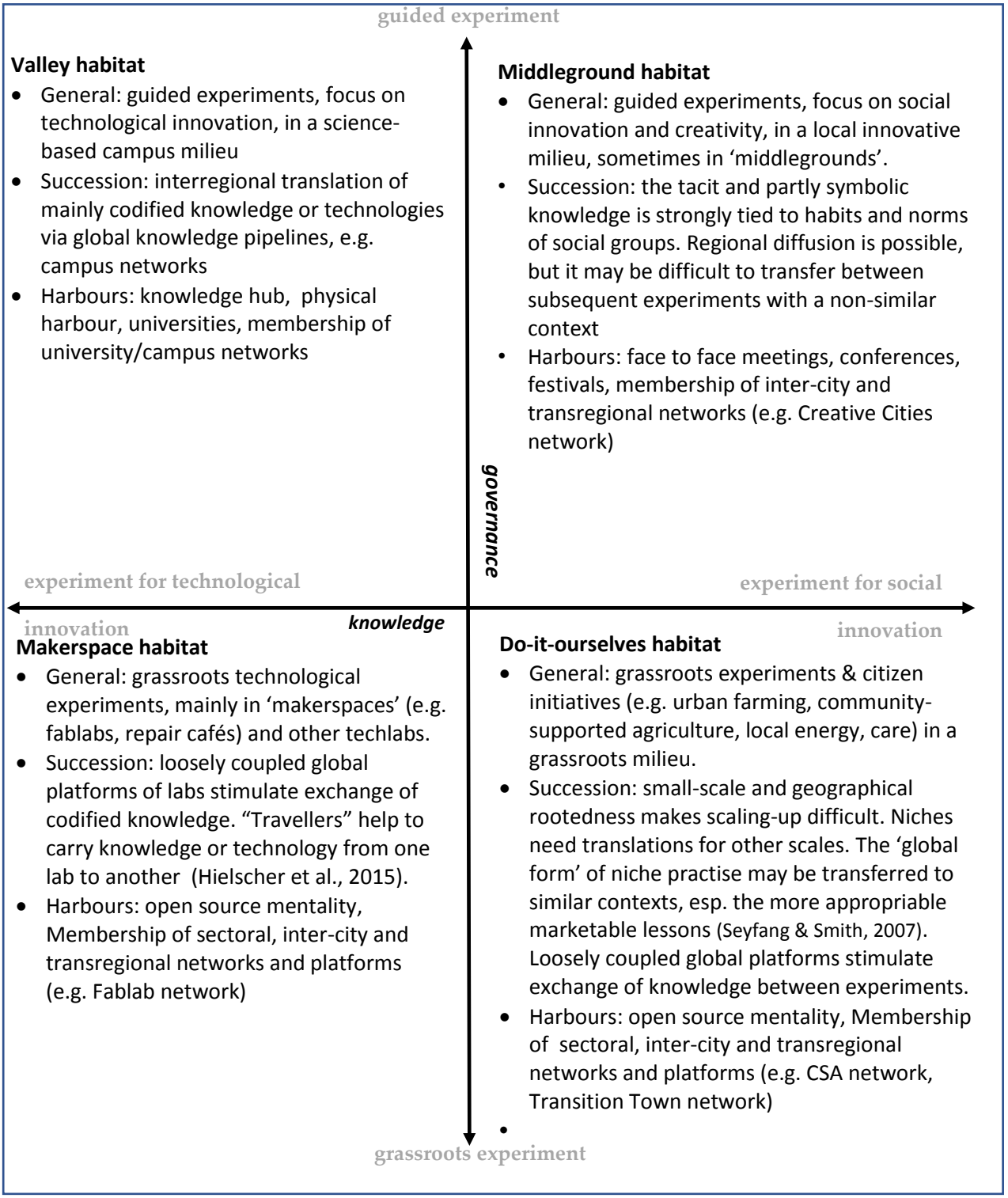

Figure 1: Succession pathways and harbours for the various habitats. The framework is a further exploration of the habitat framework (van den Heiligenberg et al, 2018).

3. Methodology

We carried out a comparative case study and selected four contrasting city-regions to capture the diversity of experiments and habitats in Europe. We analysed Budapest-local urban food, Karlsruhe-future district, Valencia-science park and Toulouse-fab region. We

build on an earlier research where we analysed the habits of these four cases. We interviewed several project leaders of experiments and several regional experts. We asked questions on learning, growth and the possibilities for scaling. In each case we zoomed in into one specific experiment which actually had travelled. For this experiment we analysed what actually had travelled, to which locations, and which harbour was needed in the departing region to enable this transfer.
The four cases are presented in Fig. 2.

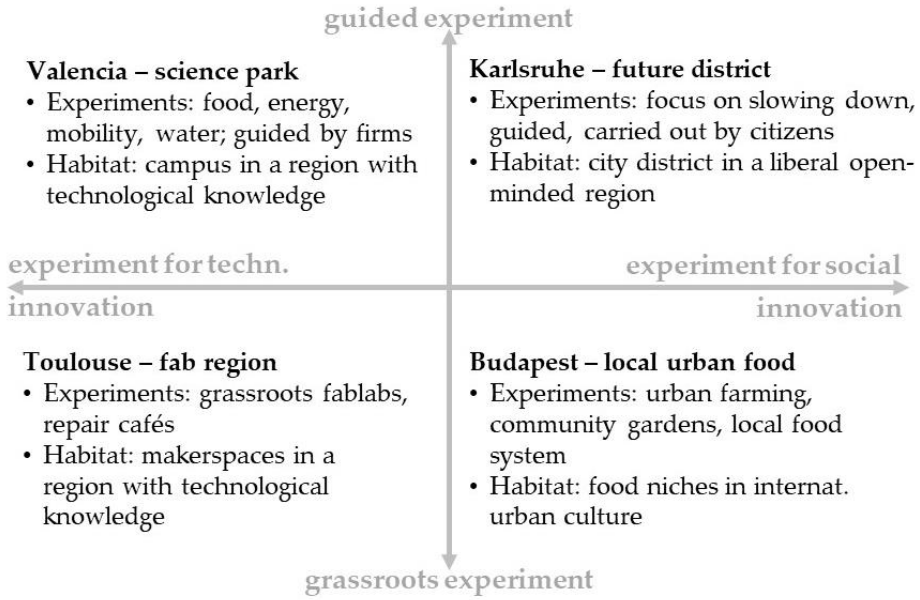

Figure 2. Summary of the selected cases. See Van den Heiligenberg et al. (2018) for a extended description.

4. Findings (first draft)

4.1. Budapest – local urban food

In the Budapest region, many grassroots food initiatives have been started in the past few years, such as initiatives for regionalized food systems, urban farming, urban gardening, responsible gastronomy and Food Banks.

Findings about the *succession pathways:*

- Budapest has a lot of international influences (multinationals, foreigners, tourists). The people bring innovative ideas (‘fresh views’).
- Respondent indicate that technicalities might be transferred to other regions, social innovations might not. An important barrier for this transfer is the non-similarity between departing and receiving region in regime context: laws, knowledge and so on. This will require new learning in subsequent experiments.
- An example of a successful succession is the Szatyor Bolt initiative, an initiative for a regionalised food system. This initiative had started 9 years ago with 3 farmers and 30 consumers in Budapest, and has lead to about 30-40 subsequent similar initiatives in cities and villages in Hungary, mostly around the city of Budapest. We can classify this

succession as a "*succession to a similar context"*. All these initiatives use the name Szatyor Bolt. However, these initiatives "*do it their own way*"

Findings about the *harbours:*

- Interviewees indicate that Budapest is centrally located in Central/Eastern Europe and has a good connectivity and accessibility ('*crossroads of Europe'*).
- Budapest is member of several interational city networks, for instance with Vienna, Rome (and Berlin?). Berlin is seen as an inspiring example for urban food innovations ("*we want to become the 2nd Berlin*!")
- Budapest is a "food hub" In Hungary, this is favourable for regional expansion of urban food innovations
- the urban farming counterculture has an open-mindedness
- The succession of the Szatyor Bolt initiative was promoted by the good reputation. In Budapest the name of Szayor Bolt is known by 50% of the population. The name is connected with stability, food and farming.

4.2. Karlsruhe – future district

In the Karlsruhe region, many sustainability initiatives have been carried out, for instance in urban gardening, fair trade, energy production, sharing, recycling and repairing.

Findings about the *succession pathways:*

- Respondents indicate that most of the initiatives are not interested to grow on the same location, but the involved people are interested to contribute to a succession elsewhere.
- There are a lot of possibilities to transfer the initiatives to other cities, for instance to "similar contexts" (i.e. medium-size?) cities in Germany
- The global form of the initiatives could be exported; an adaptation to the new local context is necessary. The new context may be non-similar: another local infrastructure, less political will or a different culture.
- The Second Future initiative, an initiative for second hand clothing, is now entering the phase of diffusion. The objective is to diffuse this initiative to other similar German habitats, such as Hamburg. Conferences, meetings, events and repair cafés will be used to promote the Second Future initiative. The aim is the meet young people from a similar counterculture on these events, who are interested to become a member of the Second Future community. We can classify this succession as *"succession to a similar context"*

Findings about the *harbours:*

- Karlsruhe has a good accessibility
- It is a university city
- Second Future needs skilled marketing people with time and commitment, who are motivated to be part of the community and use social media and online marketing

4.3. Valencia – science park

In the Valencia region, many technological sustainability experiments have been carried out, for instance in food (e.g. biological agriculture), energy (e.g. ICT and technology), mobility (e.g. electrical vehicles), circular economy (e.g. plastics) and water (e.g. water savings).

Findings about the *succession pathways*

- In the succession the technology is considered as the easy part. The transfer of innovations requires adaptation to the local situation *("You have to deal with local cultures"*).
- Valencia is able to to use global [city?] networks as "carriers" of the succession of experiments.
- An example of a successful succession is the Cysnergy innovation, it is a measuring device for energy use of machines. The firm developed a three-step approach for the succession of experiments: (i) test the innovation in the region and evaluate the test (ii) find your first customers nearby in Spain, and (iii) export to other countries. The transfer of the technology is easy (although some countries have high import taxes), but the developers realise themselves that the export requires to be respectful to other cultures, and that you as an employee have to adapt yourself to the local context. We can classify the first step of this succession as a *"succession to a similar context"*

Findings about the *harbours*

- Two universities and a lot of tech R&D institutes
- A general regional open-mindedness
- Young people with an international orientation
- Global city, accessibility (airport, port, high-speed train)
- Cysnergy needs employees who are respectful to other cultures

4.4. Toulouse – fab region

In the Toulouse region, many grassroots technological experiments are carried out, for instance in approximately 35 fablabs, various repair cafés, a hackerspace, ICT associations and electronics associations.

Findings about the *succession pathways*

- Various succession pathways are possible. From fablab to Fablab (globally), from lablab to incubator (regional), From fablab to company (regional). With these partners it is important to build trust relations.
- Codified knowledge in fablabs is easily transferable globally, with Internet, open-source, good documentation, a sharing mentality and the membership of a global fablab network. However, trust relations in the fablab network are also important.
- Adaptation of fablab prototypes and repair café solutions to the local situation is necessary. We have to deal with non-similar contexts, such as cultural and ethical contexts.
- An example of a successful succession in Toulouse is the Repair Café initiative. Repair cafés are sometimes a member of informal international networks. The Repair Café in Toulouse has visited a similar initiative in Berlin to find solutions for entering the market. Berlin is considered as a frontrunner. The Repair Café initiative is transferred from Toulouse to three other cities in the region. The linkage was formed by (i) skilled

employees and (ii) the technology. Only a part of the initiative was transferred (i.e. the part that was subsidised by the government). We can classify this succession as a "succession to a similar context".

Findings about the *harbours*

- Conferences, festivals and events to stimulate diffusion
- Membership of international networks of fablabs/repair cafés
- An open innovation strategy in the region
- Open-mindedness in the region
- Open-source mentality in combination with the ambition to share knowledge
- The Repair café needs skilled employees (trainers), to train the people in the three successive initiatives

5. Conclusions (first draft)

- Our research question was: What are favourable regional conditions for the succession of sustainability experiments, on the same location or by transferring and translating sustainability experiments to other locations and regions worldwide? We found a mix of physical assets (universities, airports, conferences), membership of networks, skilled actors (involved in transfer and learning) and cultural conditions (open-mindedness, open-source mentality)
- There is a large variety in succession pathways between the various habitats
- Replication of experiments does hardly happen, i.e. the innovation is not exactly copied to the new location. Often the innovation is 'translated': either only a part of the innovation is traveling, or only the conceptual idea behind the innovation is traveling. An adaptation of the innovation to the new local context is needed most of the times.
- When comparing the favourable context conditions for experimentation versus succession we see large differences. From a regional stakeholders perspective we conclude that the shift from isolation towards openness may be challenging.

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