Fostering change through innovation: The role of innovation intermediaries in realizing transitions to sustainability

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Master's Thesis for the Environment & Society Studies programme
Nijmegen School of Management
Radboud University

August 2025

Colophon
Title: Fostering change through innovation: The role of innovation intermediaries in realizing transitions to sustainability

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Master's Thesis for the Environment & Society Studies programme
Specialization Local Environmental Change and Sustainable Cities

Nijmegen School of Management
Radboud University

August 2025

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Supervisor internship: B. Valk

Internship company: Innofest

Word count: 18.746

Photo credit: Hendrick, S. (2024)

Preface

Before you lies the thesis 'Facilitating change through innovation: The role of innovation intermediaries in realizing transitions to sustainability'. This thesis is written to complete the Master's programme Environment and Society studies, specializing in Local Environmental Change and Sustainable Cities, at Radboud University in Nijmegen.

For years, I have been frustrated with many unsustainable practices that our modern-day society adheres to. Even though I try to live a life that is less harmful for the environment, I often feel powerless in preserving our planet for ourselves and future generations. My personal decisions do not seem to have much effect when political choices neglect the importance of climate change. But when I seem to lose faith, there are hopeful individuals, initiatives and organizations that commit to creating a more sustainable world, one step at a time. We – as a society – can count ourselves lucky that there are so many people dedicated to this cause, fighting the often discouraging regime. My lifelong search for how I can make the world a better place through implementing more sustainable practices and finding out how I can make a positive impact has led me to my internship organization Innofest. In this thesis, I want to show what exactly the role is of such an organization, how they impact sustainability transitions, and what we might learn from them.

Before continuing, I would like to thank my thesis supervisor Ingrid for the guidance these past six months. Even though we only had online meetings, and in the first one I felt like crying because I was so lost, we made it to the end! I am genuinely proud of the research that I have done and the thesis it has become. Furthermore, I would like to thank my internship supervisor Benthe Valk and co-supervisor Cher Osinga and all my other colleagues at Innofest for their help, guidance, and positive work environment. Lastly, I would like to thank my family, boyfriend and friends for all their support this last year. I truly would not have made it to this point without all of you.

Now let's get into it! I hope you enjoy reading.

Summary

This thesis investigates the role of innovation intermediaries in fostering social innovations that contribute to sustainability transitions, with a focus on the internship organization Innofest. The central question addressed is: 'How do innovation intermediaries enable social innovations that support sustainability transitions?'

Contemporary sustainability issues and the high failure rate of innovation projects (50-90%) expose the urgency of research on social innovations that support sustainability transitions (Wang, 2023; Sachs et al., 2019). Social innovations, defined as new ideas, practices, or instruments that meet societal needs and support social progress, are essential for addressing global environmental challenges (Wang, 2023). Innovation intermediaries can increase the success rate of these innovations by providing support for testing and validation in so-called Living Labs: real-life experimental environments (Paskaleva & Cooper, 2013; Reid & Baker, 2018). The current research aims to fill a gap in the existing academic literature, that focuses predominantly on technological innovations and insufficiently highlights the specific role of intermediaries in social innovation. Furthermore, the practical implications of these roles are insufficiently researched (Noviaristanti et al., 2024; Zajko, 2018).

In order to gain an in-depth understanding of transitions, the theoretical framework builds upon the Multi-Level Perspective (MLP) (Geels, 2011) and implements an actor- and agency-oriented analysis, emphasizing the roles of transformative actors in transitions. These roles are frontrunner, connector, toppler and supporter (De Haan & Rotmans, 2017). To answer the research question, a mixed-methods case study approach is used, utilizing data triangulation through semi-structured interviews with Innofest employees, survey data from innovators, and 6-months of participatory observations at the internship organization. This approach allows the thesis to gain an in-depth understanding of Innofest's operational practices and the perceived impact by the involved actors.

Based on the typology of actors in transitions provided by De Haan & Rotmans (2017), the findings disclose that Innofest's primary role is that of a connector by connecting innovators with essential resources and networks. Furthermore, Innofest adopts the role of a supporter by providing experimental testing environments and resources without immediate market pressure. This support is vital for innovators to gather actionable feedback, refine their prototypes, and validate their assumptions regarding product-market fit. Innofest also takes on the role of a frontrunner by supporting innovations early in the innovation cycle, enabling the emergence of novel ideas. Furthermore, they initiate new projects and approaches, like the development of an online model to offer autonomous support to innovators on a larger scale. The role of a toppler, which involves challenging existing dominant systems, is not a primary function but is an implicit outcome of supporting innovative alternatives that have the potential to compete with or merge with incumbent systems over time.

The research concludes that Innofest contributes to sustainability transitions by strategically focusing its support on social innovations that have the potential to create a better world. The organization's method reduces the probability of innovation failure by ensuring that innovators validate their assumptions early on, preventing a waste of resources and accelerating their process toward market introduction and adoption. By supporting a multitude of these initiatives, Innofest facilitates a collective effort that contributes to positive changes in the existing regime.

Keywords: sustainability, transitions, social innovation, innovation intermediaries, Living Labs.

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Term	Definition
Social innovation	The development of new ideas, practices, and instruments that challenge often systemic social and environmental issues in support of social progress.
Living Lab	Real-life testing environments, facilitating user influence in open and distributed innovation processes engaging all relevant actors.
Innovation network	Network of people, ideas and organizations in which resources and knowledge are shared, enhancing innovation capabilities.
Sustainability transitions	Changes across multiple dimensions that lead to a fundamental shift in socio-technical systems, often aimed at shifting established systems towards more sustainable methods. They involve shifts in user behavior and institutional structures.
Socio-technical landscape	The underlying structures that support the stability of an existing system, such as worldviews and natural aspects.
Regime	Dominant systems and the networks of actors that sustain them, such as established industries, infrastructures or policies.
Niche	Protected space in which alternative approaches to existing practices emerge.
Stream	Value set that is embodied in a system.
System	Institutionally coherent set of solutions with which societal needs are met.
Transition intermediary	Boundary spanning actor skilled at building bridges between different groups, departments, organization or sectors.
Frontrunner	Actor that makes alternative solutions known and available early on.
Connector	Actor that connects solutions, systems and actors.
Toppler	Actor that challenges established institutions to make way for alternative systems.
Supporter	Actor that adopts and supports transformative change.
Strategies	Specific intentions of an actor, based on their beliefs about the right solution in relation to the value of the connected stream.
Initiatives	Alliances between actors and supporters, with the goal to make alternative solutions known or available
Networks	Alliances on the basis of shared values.
Movements	Alliances that bring together various actors that do not necessarily have a direct link to the actors within the alliance. They are connected to the movement through its value sets.

1. Introduction

1.1 Problem statement

Climate change, loss of biodiversity, pollution and climate injustice are significant contemporary global issues (IPPC, 2023; Díaz et al., 2015). They highlight a tipping point in Earth's biophysical systems that crosses planetary boundaries (McKay, 2021). Planetary boundaries define the safe limits for human activities on nine critical processes (Rockström et al., 2009). These processes are climate change, ocean acidification, chemical pollution, nitrogen and phosphorus loading, freshwater use, land conversion, biodiversity loss, air pollution, and ozone layer depletion (Raworth, 2012). Crossing the limits of a process can destabilize the planet's ability to regulate itself, causing irreversible environmental changes (Rockström et al., 2009). Richardson et al. (2023) argue that today, humanity is placing unprecedented pressure on Earth's systems causing all planetary boundary processes to be at or close to a high-risk level of transgression, in turn weakening global resilience capacity. The striking pressure that humanity is placing on Earth's systems emphasizes the need for transitions towards sustainability (Sachs et al., 2019). Sustainability transitions are socio-technical transitions that aim to shift established systems towards more sustainable methods of production and consumption (Smith et al., 2005). They underscore the importance of sustainable development, which can be characterized as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Rattanasirivilai et al., 2025). It calls for an integrated approach that considers environmental concerns as well as economic development (United Nations, n.d.). Sustainable development entails ensuring that all of humanity, current and future generations, has access to necessary resources to fulfill their human rights, such as food, water, healthcare and energy (Raworth, 2012).

To deal with the interlinked challenges of environmental sustainability, the international community has drawn up an ambitious agenda promoting equity and eliminating poverty through the Sustainable Development Goals (SDGs). The 17 United Nation goals are "an urgent call for action by all countries in a global partnership" (United Nations, n.d.). To address these problems, complementary actions by governments, civil society, science and business are required (Sachs et al., 2019). Besides the international character of the approach, Ansell et al. (2022) highlight the influence of local activities in developing the SDGs. They stress the need for local initiatives that can promote innovative solutions and inclusive decision-making through fostering collaboration among various stakeholders. However, there are growing critiques on the SDGs, including the lack of binding commitments, insufficient attention given to global inequalities, insufficient funding and investment, implementation and monitoring and a remaining reliance on economic growth (Morton et al., 2017; Swain & Yang-Wallentin, 2020). Grassroots movements and scholars question the effectiveness of the SDGs in addressing ecological, social and economic development drivers and their underlying power relations (Kopnina, 2015).

According to the European Commission (n.d.), an integral part of sustainability transitions is an increased utilization of research and innovation to realize a more productive and green economy. Social innovations, defined as new products, services or instruments that meet societal needs and support social progress, directly address societal and environmental challenges (Wang, 2023; Zapata-Aguilar, 2024). They often aim to transform existing systems and structures in ways that promote inclusivity, equity, and sustainability (Ribas & Macke, 2021). However, 50-90% of innovation projects fail due to a number of reasons. These can be complex and unpredictable environments, internal organizational issues or consumer resistance (Wang, 2023; Reddy et al., 2023). Consumer resistance to new products or services can be attributed to many reasons, among which the preference to adhere to the status quo and have a general resistance to change. Furthermore, consumers' resistance can be driven by specific barriers related to the product, such as perceived complexity (Heidenreich & Spieth, 2013). To overcome these barriers, entrepreneurs with an innovation, or innovators, can test and validate assumptions regarding their innovation. This can be done in Living Labs: real-life testing environments (Paskaleva & Cooper, 2013). By doing this early in the innovation process, it is ensured that the product or service can perform reliably in a real-life scenario, meeting the intended needs (Nyström & Leminen, 2011). This not only validates the effectiveness of an innovation but also enhances its alignment with user expectations and market demands (Reid & Baker, 2018; Long et al., 2020). Living Labs bring together different actors within and outside of the innovation network (Nyström & Leminen, 2011). The innovation network is a network of people, ideas and organizations in which resources and knowledge are shared, enhancing innovation capabilities and eventually accelerating the innovation process (Ahrweiler & Keane, 2013; Dolińska, 2012; Morisson & Pattison, 2020). Actors in the innovation network play different roles in enabling innovation. Innovation intermediaries are skilled at building bridges between these actors and their aligning sectors, supporting actors within the network. Innovation intermediaries can take on multiple roles in order to achieve a certain goal (De Haan & Rotmans, 2017).

Despite the growing significance of innovation intermediaries in the development of social innovations, their exact role remains under-researched. While it is acknowledged that intermediaries are crucial in fostering collaboration, enabling knowledge exchange, and accelerating innovation processes (Sovacool et al., 2020; Kivimaa et al., 2019), the practical implications of their role in enabling social innovation is insufficiently understood. Current literature focuses on technological innovations, creating a gap in the understanding of social innovations and their networks (Noviaristanti et al., 2024; Zajko, 2018). This research aims to add specific practices and challenges of innovation intermediaries in enabling social innovations in sustainability transitions to the existing knowledge.

1.2 <u>Innofest</u>

The research is conducted at the internship organization Innofest, a non-profit organization driven by impact. They are committed to creating a sustainable and social society and believe that innovation plays an important role in the acceleration of the transitions that are necessary to reach this goal. Therefore, Innofest gives innovators the opportunity to test their innovation in practice, at festivals and other living labs. A key aspect of their approach is that these innovations have the potential to support sustainable and social transitions. Test locations resemble reality as closely as possible and are therefore very well suited to validate assumptions by entrepreneurs about their innovation. They can be seen as micro-societies. In addition, the temporality and challenges of these locations and the possible lack of strict rules and regulations create a space where more is possible than in the 'normal' public space. In this way, living labs are the perfect environment to test solutions that could contribute to accelerating transitions towards sustainability. By collecting data at these living labs, entrepreneurs can eventually make more impact in the 'real world' (Innofest, n.d.).

1.3 Research aim and research question

This research aims to gain insight into the role of innovation intermediaries and the impact their role has on sustainability transitions. Innovation intermediaries are actors that have the potential to support social innovations. By enabling social innovation, intermediaries can ensure that social innovations make an impact on real-world actors and systems. The main question this research aims to answer, is therefore:

How do innovation intermediaries enable social innovations that support sustainability transitions?

To answer the main research question, the following sub-questions will be answered:

1. What roles do innovation intermediaries adopt in supporting the development of social innovations?
2. How do innovation intermediaries contribute to sustainability transitions?

1.4 Scientific relevance

While research on transitions to sustainability has developed rapidly in the last decade, a clear gap can be recognized in the existing research on the specific roles and effectiveness of innovation intermediary organizations in sustainability transitions. There is a lack of definition of the roles intermediaries can play in innovation networks and their added value to the development of social innovations (Noviaristanti et al., 2024). Additionally, the existing research is mainly focused on technological innovations, while research on innovation intermediaries in social innovation is rarely carried out (Noviaristanti et al., 2024; Conroy et al., 2023; Zajko, 2018; Stewart & Hyysalo, 2008). The technology-oriented focus is driven by the perceived potential of market creation and competitive advantage that technological innovation has (Ringberg et al., 2019). This research adds to the existing academic literature by gaining an in-depth understanding of the role of intermediary innovation organizations in transitions to sustainability. Existing frameworks and literature on transitions (De Haan & Rotmans, 2017; Wittmayer, 2024; Fischer & Newig, 2016; Avelino & Wittmayer, 2015) are further enriched by an empirical case study that exposes the interactions between different actors. By analyzing how an innovation intermediary operates, this research provides a detailed picture of how these roles influence social innovation. Furthermore, it focuses on actors and agency in transitions, adding to the academic debate of the role of actors in sustainability transitions. This complements the operationalization of transition roles, as discussed by Wittmayer (2024), Fischer & Newig (2016) and De Haan & Rotmans (2017). In this way, the research adds to a better understanding of mechanisms, challenges, and factors of success that enable social innovations.

1.5 Societal relevance

The growing body of academic literature shows that despite an increase in innovation research, the challenge to engage with real-world actors, systems and transitions remains (Köhler et al., 2019). This research aims to work towards solving this issue, and insights of the research are directly applicable for diverse stakeholders that are involved in enabling and advancing social innovations and sustainability transitions.
First, the research contributes to a better understanding of how social innovations can be effectively supported in their development and scaling. By analyzing the role of an innovation intermediary, it offers concrete insights and best practices that other organizations and societal initiatives can apply to optimize their own social innovation processes. Second, the findings of this research can inform relevant actors on effective strategies that stimulate social innovation. This can lead to more focused subsidies or financing that support the development and implementation of social innovations. Third, entrepreneurs with social innovations can benefit from the insights of this research, revealing the value of innovation intermediaries. It can help understand how the feedback cycle, networks and Living Labs that an innovation intermediary might offer can be optimally used to improve their product or service, in order to increase their impact. Lastly, the focus on the connection and collaboration between different actors shows the importance of an innovation network in sustainability transitions. The insights gained can add to strengthening such networks, by showing which specific roles and mechanisms are effective in bringing together diverse stakeholders for a common goal. To summarize, the research offers useful insights for subsidy providers, intermediary organizations and social innovators, that all play a crucial role in realizing transitions to sustainability.

2. Innovation

This chapter introduces the broader academic literature on social innovation, including innovation networks, Living Labs and the innovation cycle. Together, this academic landscape offers an introduction in what innovation – with a focus on social innovation – is exactly and what processes are linked to innovation.

2.1 Social Innovation

Sørensen and Torfing (2011) define innovation as "an intentional and proactive process that involves the generation and practical adoption and spread of new and creative ideas, which aim to produce a qualitative change in a specific context" (Sørensen & Torfing, 2011, p. 849.). Social Innovation (SI) can be defined as the development of new ideas, practices, and instruments that challenge often systemic social and environmental issues in support of social progress. As described by Pol & Ville (2009, p.4): "An innovation is termed a social innovation if the implied new idea has the potential to improve either the quality or the quantity of life. Social innovation can take the specific form of actions, movements, models, systems, processes, products, services, rules and regulations, or even new organizations or institutions." Here, the focus of innovation lies not within a company, but within the whole society (Edwards-Schachter et al., 2012).

SI is a crucial approach to address global issues like climate change, demographic shifts and economic inequalities. Unlike other types of innovation, SI is oriented to the social and public good, and to a lesser extent to the market (Pol & Ville, 2009). It is a process involving both tangible forms of capital, such as physical and financial, and intangible forms of capital, such as social capital (Edwards-Schachter et al., 2012). Due to the growing emphasis on the concept of sustainable development, there is an increasing interest in developing innovations that reconcile economic, environmental and social goals. These can be referred to as sustainable innovations. Sustainable innovation is an element of social innovation (Cillo et al., 2019). A growing critique, however, is whether this win-win-win situation is feasible (Raworth, 2012).

SI lacks clear boundaries and can therefore be found everywhere. It may take place in all sectors of society; through government or politics in the public sector, through NGO's, social movements and charities in the non-profit sector or by research initiated by universities in the private sector. SIs can be principal ideas like the separation of powers, human rights or parliament, but they can also be more concrete ideas such as energy cooperations, green cities, carpooling or the Red Cross (Enthoven, 2023; Zapatar-Aguilar, 2024).

Governments at both national and local levels can play a significant role in stimulating and developing SIs, especially by expanding their capacities to facilitate and cooperate. SI can serve as a trigger to rethink the function of public institutions and how they engage with society. According to some authors, the state is no longer the only provider of public goods and services aimed at addressing social challenges. Instead, its role is changing into that of an enabler; an actor that promotes and stimulates the co-creation of public services (Enthoven, 2023; Reddy et al., 2023; Satalkina & Steiner, 2022). SIs rely on democratic governance and inclusive decision-making. They emphasize the need for citizen participation, which is essential to empower local communities and foster sustainable societal change (Afeltra et al., 2021).

While SI's can be principal ideas, Innofest focuses solely on social innovations that are market oriented. Therefore, when addressing social innovations, this research indicates products or services that aim for market introduction.

2.2 The Innovation Cycle

Historically, innovation has been conceptualized as a linear process of development. It is linked to product development and the act of taking that product to the market. In the linear innovation model, a range of stages are undergone, such as research, development, production and marketing (Green, 2015). This way of thinking drives the assumption that there is a generalized chain of causation and neglects the multiple feedback loops and iterations that occur during the evolution of an innovation (Green, 2015). Instead, not all innovations originate from scientific research. Innovation increasingly originates from an organization's ability to review and combine new and existing, and internal and external knowledge. This open innovation process relies on the relationship between the end-user or consumer, the product, firm or organization and the market (Marques, 2014). Organizations gather and employ consumers' insights and outside expertise to develop new products and services. The extent to which innovation is open or closed depends on the extent to which an organization interacts with its environment (Elmquist et al., 2009). Closed innovation processes rely primarily on internal knowledge and resources. In contrast, open innovation processes leverage today's highly networked and knowledge-based economy to enable broader knowledge-sharing across organizational boundaries, thereby enhancing innovation outcomes (Green, 2015).

Social innovation encompasses different stages in the so-called innovation cycle (figure 1). To start a social innovation project, one needs to identify a problem, come up with an idea, test and validate this idea, develop a business plan, and launch and scale the project (Reddy et al., 2023). The number and naming of stages varies based on the framework used. This research encompasses the stages as shown in figure 1.

Figure 1: The innovation cycle, created by author, 2025. Based on Reddy et al. (2023) and Burgos (2019).

The different stages of the innovation cycle can be revisited and adjusted as needed. In this way, knowledge that is gathered through open innovation processes can be used to adjust an innovation at a certain stage in the innovation cycle. These feedback loops allow for adjustments and improvements, fostering a dynamic innovation environment (Burgos, 2019).

2.3 Living Labs

Living Labs (LLs) emerged in the early 2000s, when private firms used the real-life testing environments for developing new technologies (Paskaleva & Cooper, 2021). The collaborative innovation approach - where users and experts can co-create new products and services - has since gained popularity among innovation scholars, policy makers and practitioners as a tool for practical innovation (Greve et al., 2021). A LL can be characterized as "a user-centric innovation milieu built on every-day practice and research, with an approach that facilitates user influence in open and distributed innovation processes engaging all relevant partners in real-life contexts, aiming to create sustainable values." (Bergvall-Kareborn et al., 2009, p. 4). Molinari et al., (2023, p. 1) add that "Living labs are open innovation ecosystems in real-life environments using iterative feedback processes throughout a lifecycle approach of an innovation to create sustainable impact". A LL allows businesses and organizations to involve end-users in the development of a new service or product in a co-creation process (Nyström & Leminen, 2011). Organizations can test and validate the relevance of their innovation by gaining insight in the wants and needs of customers. They can respond to these understandings by exploring how they can meet these needs, in turn creating value for those customers (Ståhlbröst, 2012). Furthermore, testing and validating innovations is important to guarantee an innovation's effectiveness (Asmar et al., 2022). LLs often fill the gap between research and development and the market introduction of a product or service (Greve et al., 2021; Westerlund et al., 2018).

Leminen et al. (2015) distinguish four different types of living labs. These are:

1. utilizer driven,
2. enabler-driven,
3. provider-driven and
4. user-driven LLs.

Utilizer driven LLs are driven by scientific research and are mostly cooperations between knowledge institutions and businesses. In these LLs, actors often work on technological innovations to improve their business. Enabler-driven LLs are interested in the market introduction of a product. They foster and support bottom-up innovation, with a focus on collaboration and co-creation. They include researchers, businesses, and governmental bodies. The enabler acts as a facilitator, creating an environment where actors can come together to test and validate innovations. These LLs typically prioritize the needs and input of end-users, who, through the LLs, are involved in the design and testing of solutions. Provider-driven LLs are more top-down and mainly led by organizations, companies, or research institutions that provide the resources, infrastructure, and direction for the innovation process. They are product-focused, mainly testing and validating products, services, or technologies in a provider-driven process. Additionally, in these LLs the provider usually controls the testing process, creating a situation that might not be as close to the real-world as in an enabler-driven LL. Lastly, in user-driven LLs, citizens, businesses, knowledge institutions and governments work together in a collaborative, bottom-up approach. The end-users are the focus of the LL and results are used to benefit the user community (Leminen, 2015; Ståhlbröst, 2012).

2.4 Innovation networks

Third parties aimed at stimulating innovation, such as publicity funded bodies, professional associations or trade associations, have a positive impact on the development of inter-organizational networks and innovation. They can employ the role of neutral knowledge brokers or act as a leader in the development of informal relationships (Dolińska, 2012). Nyström et al. (2014) define LLs as networks of open innovation. However, innovation networks do not need to take the form of a LL. They involve the “interplay of people, ideas and organizations to create new, technologically feasible, commercially realizable products, processes and organizational structures” (Ahrweiler & Keane, 2013, p. 73). These innovation networks, as argued by Nyström et al. (2014), are shaped and embodied by their participants. They consist of independent actors who enhance their innovation capabilities by working together through sharing their resources and knowledge (Dolińska, 2012). In doing so, innovation networks accelerate the innovation process (Morisson & Pattison, 2020). Innovation networks play a fundamental role as connectors between actors and sectors (Morisson & Pattison, 2020).

3. Theoretical framework

Chapter three sketches the broader theoretical landscape of sustainability transitions through an outline of transformative change. Transitions can occur in different ways and on multiple levels, through the actions of transformative actors. The role of actors in transitions is highlighted and clarified.

3.1 Transformative change

The research on transitions is part of a larger academic body focused on transformations and transformative change. Transformations refer to fundamental changes in functional, relational, structural and cognitive aspects across technological, economic and social factors (Visseren-Hamakers, 2022; Scoones et al., 2020). They have a dynamic nature and are characterized by non-linear changes across various dimensions and different scales (Vilsmaier & Ross, 2024). Transformations often emerge as a response to crises (Boland, 2024). Transformative change occurs more intentional and is initiated to reshape institutional assumptions and cultures (Holley, 2024). It refers to a pervasive, intentional, and sustained system-wide reorganization, including paradigms, goals and values (Visseren-Hamakers et al., 2022; Holley, 2024). Transformative change focuses on impactful shifts driven by interdisciplinary and transdisciplinary inquiries aimed at addressing complex challenges (Vilsmaier & Ross, 2024). The formal and informal rules, rulemaking systems and actor networks are involved in enabling transformative change, at all levels of human society. Transformative change focuses on the underlying societal causes of issues, transforming the indirect drivers of these issues (Visseren-Hamakers et al., 2022). However, current governance instruments are not focused enough on the indirect drivers of sustainability problems, creating a gap between the goal that is set and achievements that are attained. Direct drivers such as greenhouse gas emissions, deforestation and land degradation are addressed, while indirect drivers such as population growth, economic growth and technological developments are often neglected (Visseren-Hamakers et al., 2022; IPCC, 2023; Kallis, 2011). An emerging approach that is aimed at creating conditions for systemic change is transformative governance (Sundqvist & Åkerman, 2024). This governance approach aims to facilitate shared efforts between private, public and civil society actors, underscoring the necessity of innovative policies and practices that promote sustainability and resilience (Arnold et al., 2024). It involves the joint implementation of various transformative approaches and modes of governance to encourage and motivate key actors towards sustainability transformation (Sundqvist & Åkerman, 2024). Transformative governance operates across three interrelated levels – the landscape (societal context), regimes (ecosystems, sectors, technological systems, areas or organizations) and niches (alternatives). The approach encompasses transitions and transformations, addressing both broad societal drivers and those specific to particular regimes (Visseren-Hamakers et al., 2022).

3.2 Sustainability transitions

A socio-technical system is a system that relies upon a technical base (Whitworth, 2009). It consists of (networks of) actors, including individuals, organizations and companies, as well as institutions such as regulations and societal and technical norms (Markard et al., 2012). These systems involve the interaction between complex human systems and the technical infrastructure that governs the nature of the system. The core of a socio-technical system lies not just in technology, but moreover in how people organize themselves around and interact with that technology and its environment. The concept of socio-technical systems emphasizes the interconnectedness and interdependence of these elements (Narwankar et al., 2018). Multiple stakeholders are involved in these systems, potentially governing them, contributing to their development, or being affected by them. This interconnected nature significantly impacts how these systems function and transform over time, especially in system transformation (Markard et al., 2012).

A socio-technical transition is "a set of processes that lead to a fundamental shift in socio-technical systems" (Markard et al., 2012, p. 956). It involves profound changes across multiple dimensions, including material, political, economic, technological and socio-cultural. They typically unfold over extended periods, often spanning decades or more, and involve a wide variety of actors. During a transition, new products, services, business models, and organizations emerge, complementing or substituting existing ones (Markard et al., 2012). Unlike technological transitions, socio-technical transitions encompass changes beyond technology itself. They involve shifts in user behavior and institutional structures, such as regulatory frameworks and cultural norms. Moreover, socio-technical transitions often require a combination of technological and non-technological innovations. These transitions not only reshape existing systems, such as transportation, but also influence related societal areas like urban planning, housing, work environments, production, and policymaking (Markard et al., 2012; Geels, 2011; Narwankar et al., 2018).

Sustainability transitions are a specific type of socio-technical transformation aimed at shifting established systems toward more sustainable methods of production and consumption. These transitions are long-term, multi-dimensional, and deeply transformative. A distinctive feature of sustainability transitions is the role guidance and governance play (Smith et al., 2005). For example, long-term sustainability goals such as the SDGs can guide the transition process, making it purposeful and intentional. Such transitions often require coordinated efforts among a wide range of actors, including policymakers, regulatory bodies, and institutions (Garud et al., 2012).

3.3 The Multi-Level Perspective

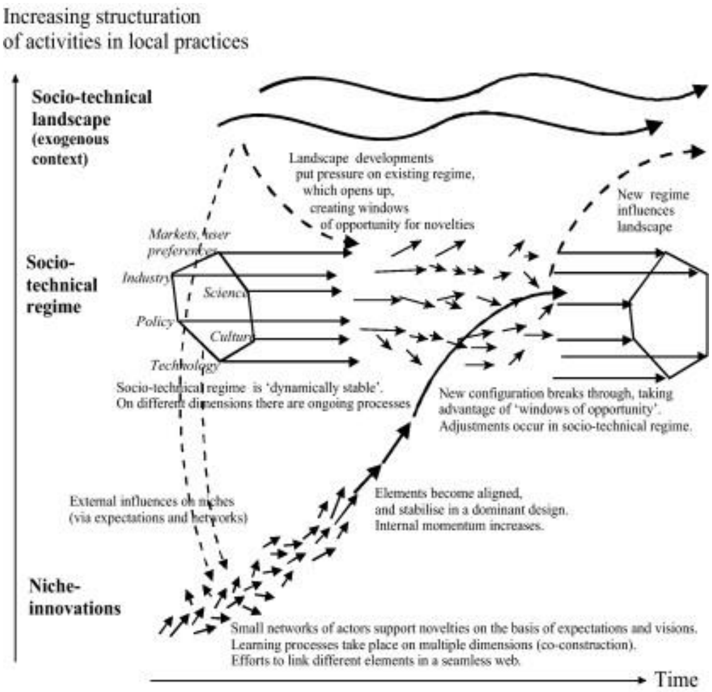
The Multi-Level Perspective (MLP) is a key foundation within transition theory, serving as a framework to collectively explore and discuss the complexities of societal systems. A central idea in transition theory is that transitions occur across three analytical levels. These are the macro-, meso- and micro level (Geels, 2011).

The macro level, also known as the *socio-technical landscape*, ensures the stability of an existing socio-technical system. It represents the underlying structure that supports this stability. It encompasses broad, autonomous social developments and trends, such as political shifts, cultural norms, worldviews and natural aspects (Van der Minne et al., 2021). The macro level operates outside the levels of niches (micro) and regimes (meso), but influences both (Geels, 2002). Changes at the landscape level are often slow and difficult to achieve in the short-term, because they include large-scale trends and exogenous events like political developments, climate change, demographic shifts, macroeconomic trends, war and crises and deep cultural and societal values. Changes can create opportunities for innovation within niches and can put pressure on regimes to adapt (Bilali, 2019).

The meso level or *regime* consists of dominant systems and the networks of actors that sustain them. These can be established businesses and industries, dominant technologies and infrastructures, rules, regulations and policies and markets. Regime actors evolve with each other and with the landscape, and adhere to established rules, practices and technologies. They form a stable and resistant structure to systemic change and to niche innovations that seek to replace the regime (Bilali, 2019). A stable regime that adheres to a favorable landscape for the regime actors can lead to path dependency and lock-ins. While regime changes tend to be gradual and follow a certain path, substantial disruptions can lead to systemic transformations, known as regime shifts (Geels, 2002).

The micro level, or *niches,* are protected spaces in which alternative approaches to existing practices can emerge and develop, for example innovations and experiments, produced by a small group of actors (Van der Minne et al., 2021). These spaces have their own unique rules, norms, and technological elements. Niche actors, such as entrepreneurs, focus on creating innovations that differ from the dominant regime. Their aim is for these innovations to eventually integrate into or replace the regime. Niches are vital for transitions, since they act as incubators for transition ideas (Geels, 2011). However, replacing an established regime is challenging due to lock-in mechanisms that stabilize the system, and nice innovations often struggle to align with regime structures (Geels & Raven, 2006). Figure 2 represents the dynamic interaction of the three levels in the unfolding of socio-technical transitions (Geels, 2011).

Figure 2: The Multi-Level Perspective on transitions, adopted from Geels (2011, p.28).



According to the MLP, transitions to sustainability require a fundamental change of the regime. These transitions, also referred to as regime shifts, can bring about changes across the entire socio-technical system (Van der Minne, 2021). Development and interaction across the different layers of the system can cause transitions to occur. Although regime change is difficult, disruptions such as climate crises can create opportunities that can lead to a regime shift. Van der Minne et al. (2021) argue that space for innovation can be created when landscape pressures become significant, leading to a re-evaluation of existing systems and enabling alternative solutions.

3.4 Actors in Transitions

While many transition frameworks focus on the systemic and interrelated nature of socio-technical transitions at the macro or systems level, an actor- and agency-oriented analysis lags behind (De Haan & Rotmans, 2017; Farla et al., 2012). Frameworks such as the MLP view transitions as a 'systemic fight', where "one or more alternative systems (niches) emerge within or alongside the existing, dominant system (the regime), which is considered to be under pressure, either from outside influences or from the inside and an emerging system replaces or transforms the dominant one leading to an overall better adapted system" (De Haan & Rotmans, 2017, p. 1). It has been criticized for focusing on technology and insufficiently considering agency in transitions (Farla et al., 2012). Instead, multiple authors argue that strategic actions of people lead to socio-technical systems change (Wittmayer, 2024; De Haan & Rotmans, 2017; Fischer & Newig, 2016; Köhler et al., 2019). Actors are participants in deliberate actions that try to initiate or prevent change. They are transformative change agents that possess agency; the "ability to act with intention – as opposed to just reacting" (De Haan & Rotmans, 2017, p.4). Actors are often narrowed down to those who support transition (*niche* actors) and those who hamper transition (*regime* or *incumbent* actors) (Fischer & Newig, 2016). Sustainability transitions involve multiple actors in different roles, relations, and interactions with each other. These actors, embedded in societal structures, shape the activities of these structures and are equivalently shaped and enabled by those activities (Wittmayer, 2024). The regime, as a structural environment, functions as a product of actors' activities and as a medium that shapes them. Wittmayer (2024) describes two types of roles in sustainability transitions: social roles and transition roles. *Social roles* can be understood as institutions to refer to broader societal positions, groups, or categories, such as policy makers or citizens. These roles enable or constrain the actions of actors and evolve with changing societal values. *Transition roles* reflect the viewpoint and actions of actors with and their involvement in the dynamics of a transition. These roles relate to how actors position themselves to influence or respond to a transition (Wittmayer, 2024).

De Haan & Rotmans (2017) propose a theoretical framework that explains transformative systemic change in terms of actions and interventions of actors and alliances. The key elements of their framework are *actors, streams* and *systems* – together known as the *stage*. Transformative change is the consequence of intentional actions of *value-driven actors*. The values that drive these actors are part of *streams*: societal value sets, upheld by the available solutions and organizational possibilities. Streams can direct strategic actions of actors and are societal value sets because they are considered good or right for society, rather than for an individual, and they are shared as societal goals. As a consequence, they correspond to an ideal - a right way of doing things - rather than specific solutions an actor might propose. Associating with a stream allows individual actors to form alliances based on a shared notion of actions that need to be taken.

Streams represent value sets that are embodied in *systems*; institutionally coherent sets of solutions with which societal needs are met. Solutions are specific ways to meet human needs that can be implemented by, or for, multiple people. Institutionalized solutions are turned into systems in order to meet needs at societal scales. Actors are guided by institutions. They are not part of a system but rather affiliate with one or more systems. Transformative change, in turn, is "a fluid unfolding of network activities aligned with a particular stream, resulting in a transformed system" (De Haan & Rotmans, 2017, p. 3). Within their framework, De Haan & Rotmans (2017) argue that actors are motivated by doing the right thing, which is not always the best thing. They do not act out of economic interest or functional, problem-solving motivations. When trying to achieve transformative change, actors are often faced with the issue that existing structures have to be broken down to adopt different solutions, or new structures have to be built to support them. Often it is a combination of both. Actors connect to a stream because they believe that the desired outcomes are valued enough for a long-term commitment. *Strategies* can be understood as specific intentions of the actor, based on their beliefs about the right solutions in relation to the value set of the connected stream.

Path dependency refers to the self-reinforcing mechanisms that maintain socio-technical systems on their current development trajectories, creating historical barriers to transformation. It emphasizes how past decisions and developments shape future options and pathways within a system (Apajalahti & Kungl, 2022). To break path dependency, institutions that bring it about have to be changed. Changing institutions means having the power to affect how people act, which can be more effectively used when actors are able to form alliances and act cooperatively (De Haan & Rotmans, 2017).

There are four fundamental transition roles of transformative change agents – actors – that can be affiliated to emerging or incumbent systems, or both, according to De Haan & Rotmans (2017) (table 1). These are frontrunners, connectors, topplers and supporters.

Table 1: Fundamental roles of transformative change agents according to De Haan & Rotmans (2017).

Frontrunners	- Solution driven: they aim to make alternative solutions known and available early on. - Act upon own personal values and do not necessarily align with a stream. - Becoming part of an alliance may connect them to a stream.	Their alternatives provide systems with *diversity*.
Connectors	- They connect solutions to systems, making them established options to society. - They connect actors with each other on the basis of shared value sets, affiliating them with a stream. - They are crucial in the formation of alliances.	They provide *connectivity* between actors, solutions and systems.
Topplers	- Mobilizing and system-oriented: they introduce, change and phase out institutions to make way for alternative solutions. - They may affiliate across different systems to achieve their goals. - By externalizing values, they attract supporters.	They provide *coherence* to alliances or changed systems.
Supporters	- Their support is an important factor in the institutionalization process of transformative change.	Their adoption and endorsement expresses societal need and provides the legitimization for new solutions and changed systems.

Actors can have multiple affiliations (with different systems) and several roles (employing different strategies). This enables the treatment of *boundary spanning* actors. Institutions and actors in systemic change processes are inextricably linked. However, Brodnik & Brown (2017) argue that not enough attention is given to their interactions. Boundary spanning actors, or *transition intermediaries,* are skilled at building bridges between different groups, departments, organizations or even sectors by pursuing connective and mediating strategies. In this way, they often connect institutions and actors in systemic change processes. They enforce communication, coordination and cooperation between these different entities (Brodnik & Brown, 2017). These actors play crucial roles in sustainability transitions by facilitating connections among stakeholders, bridging new ideas and technologies with existing regimes, and engaging in activities such as knowledge sharing, brokering, networking, and innovation diffusion (Sovacool et al., 2020; Kivimaa et al., 2019). The transition intermediary role is not limited to a single kind of organization, instead it can be taken on by foundations, funding bodies, government agencies, networks, industry groups, or businesses. This increased attention to intermediaries coincides with a broader shift in sustainability transitions research towards examining the role of networks and collective action (Fischer and Newig, 2016; Koistinen, 2019). Recent studies have also highlighted how intermediaries may not only challenge existing systems but also work alongside or be established by incumbents, thus shaping the direction and pace of change (Masuda et al., 2022).

To successfully implement a solution, actors must receive support for their measure. Consequentially, strategies to achieve transformative change inevitably involve some alliance between actors and supporters. Crucial alliances are *initiatives, networks*, and *movements*. *Initiatives* make alternative solutions known or available by being an organized endeavor of actors within this aim. They often are the work of frontrunners, with involvement of connectors and topplers. An initiatives' goal is to provide new or alternative solutions to what is offered by the incumbent systems. Since they are usually initiated by frontrunners, initiatives often only accidentally align with a stream. Connectors unite actors and their initiatives on the basis of shared values to form *networks*. Becoming part of a network makes alignment with a specific stream a necessity. Networks can be formalized organizations such as unions, or they may be loose affiliations with like-minded actors. *Movements* often form through the efforts of topplers, who initiate change by articulating and promoting the value sets that align actors with a rising stream. Movements bring together various actors, including topplers and supporters, and may also attract frontrunners and connectors. As a result, initiatives and networks can become part of the broader movement. Unlike networks, supporters of a movement do not necessarily have a direct link to the actors within the alliance. Instead, they are connected to the movement through its value sets, engaging with them at a more abstract level (De Haan & Rotmans, 2017).

De Haan & Rotmans (2017) argue that there are two ways to depict a transition. One is the drying up of a stream representing the values embodied in the incumbent system and the rise of the stream of the emerging one (figure 3). The other is the growing of the emerging system into co-evolution with the declining incumbent one (figure 4). Both figures highlight the importance of actors in transitions and differ substantially from the MLP considering they don't depict a systemic shock or sudden takeover of the regime.

Figure 3: Dynamics on a transformative stage, with an incumbent system being replaced by an emerging system. Adopted from De Haan & Rotmans (2017, p. 8).

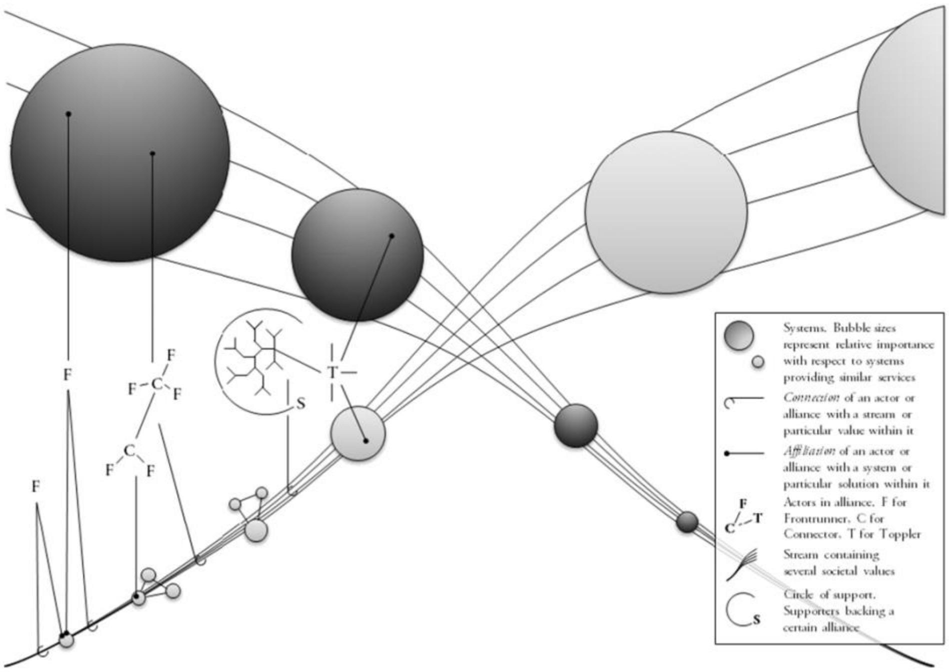
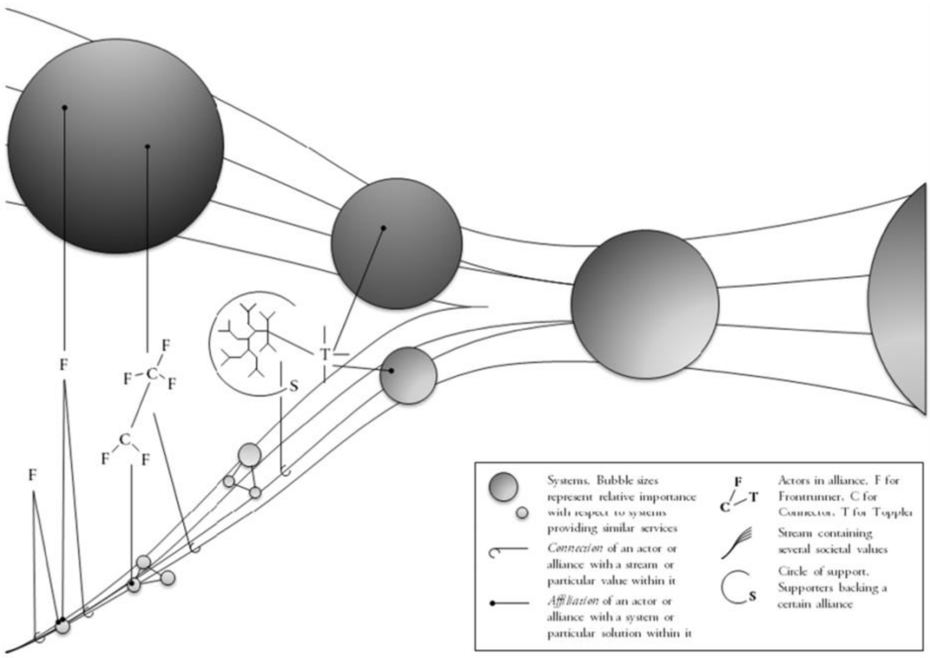


Figure 4: Dynamics on a transformative stage, with an incumbent system merging with an emerging system. Adopted from De Haan & Rotmans (2017, p. 9).



3.5 Barriers to innovation

There are also challenges that might hinder social innovation, causing 50-90% of all innovation projects to fail (Wang, 2023). These failure rates exclude innovations that fail prior to launch and only include fully commercialized products. Therefore, the true failure rate of innovations is significantly higher (Heidenrich & Spieth, 2013). Examples show that challenges include a lack of awareness about social issues, resistance to change, regulatory barriers and limited access to funding and resources (Reddy et al., 2023). Consumers have the propensity to reject the adoption of an innovation (Chukwuma-Nwuba, 2013). Most innovations fail because they do not reach the critical group of supporters that is needed for further diffusion in the market. Many new products therefore fail as they get rejected by consumers through passive or active resistance to change (Moldovan and Goldenberg, 2004; Heidenrich & Spieth, 2013). Consumers can experience specific barriers related to an innovation, such as perceived complexity, and as a consequence show active innovation resistance. Passive innovation resistance originates from an individual's status quo satisfaction and resistance to change disposition (Heidenrich & Spieth, 2013). Regulatory barriers can hinder effective information flows and collaboration among innovators and other actors in the innovation network. They can restrict problem-solving approaches, contributing to the failure of an innovation project (Hadfield, 2009; Pedraza-Farina, 2017). Lastly, limited access to funding and resources is particularly a challenge for small and medium-sized enterprises. Restricted access to funding often leads to a cycle of low-level innovation, limiting competitive advantage and growth potential (Harel et al., 2020). Alternative financial mechanisms, such as affiliations with funding actors, can support innovation in resource-constrained environments (Tajeddin et al., 2024).

4. Conceptual framework

To answer the research question '*How do innovation intermediaries enable social innovations that support sustainability transitions*?', it is important to adequately analyze the collected data using theories and frameworks discussed in the theoretical framework. An important step in the analysis is making the introduced concepts measurable. This is done through assigning indicators to each concept and explaining how exactly this indicator will be measured.

To answer the first sub-question '*What roles do innovation intermediaries adopt in supporting social innovation?*', the frameworks on roles of actors in transitions are used. Especially, the characteristics of transition roles as defined by De Haan & Rotmans (2017) are employed. These roles are frontrunner, connector, toppler and supporter. Indicators per role can be found in table 2. Furthermore, their impact on enabling social innovation is measured through survey questions.

Building on the MLP, the framework of De Haan & Rotmans on transitions is furthermore used to answer the second sub-question '*How do innovation intermediaries contribute to sustainability transitions?'*. Implementing figure 3 and 4 on the dynamics on a transformative stage, the contribution of Innofest in sustainability transitions is researched. While the roles of innovation intermediaries are researched in sub-question 1, the indicators overlap for both sub-questions. Therefore, table 2 clarifies which indicators are employed to answer which sub-question(s).

An overview of the conceptualization of the theoretical concepts introduced in chapter 2 and 3 is found below (table 2).

Table 2: Conceptualization of theoretical concepts.

Concept	Variable	Operationalization	Indicators	Measure	Target group	Sub-question
Actors in transitions	Identifi-cation of actors	What are relevant stakeholders for social innovation and how are they involved in enabling social innovation?	Typology of actors Role that actors play in enabling social innovation	Overview of partners and stakeholders Interviews: questions on how actors influence social innovation Observations: on which actors Innofest collaborates with	Innofest employees	1
	Interaction between actors	How does Innofest facilitate the collaboration and knowledge exchange between actors?	Collaborations originated through Innofest Experienced added value of Innofest for the innovation network	Interviews: questions regarding the collaboration between Innofest and other actors Surveys: open questions regarding the impact of Innofest in connecting actors in the innovation network Observations: on how Innofest connects different actors	Innofest employees & innovators	1
	Influence on transitions	In what ways do Innofest's activities influence transitions to sustainability?	Role that innovators play in transitions to sustainability Influence of Innofest on social innovations	Interviews: questions regarding the extent to which Innofest contributes to sustainability transitions and social innovation Survey questions: regarding the impact of the innovations in	Innofest employees & innovators	2

				transitions to sustainability		
Transition roles	Frontrunner	How does Innofest stimulate and accelerate social innovation? How does Innofest initiate and/or experiment with new ideas, practices and technologies that challenge the status quo?	Time frame from idea to prototype or from prototype to market entry Ways in which Innofest invests resources in uncertain ventures Communication on alternative narratives Evidence of initiating pilot projects	Interviews: questions on the projects Innofest initiates, the resources they invest and their communication on alternative narratives Surveys: open questions on the impact of the innovation in sustainability transitions and closed questions on the phase of the innovation before and after testing with Innofest Observations: on the projects Innofest initiates and how they do so	Innofest employees & innovators	1 & 2
	Connector	How does Innofest create and maintain a network of relevant actors that can support social innovation? How does Innofest connect relevant actors?	Description of their role in bringing diverse actors together Number of collaborations they are involved in Stories of success in securing funding or other resources for collaborative initiatives Evidence of aligning interests and resources from different sources Having expertise or connections in multiple domains relevant to the transition	Interviews: questions regarding who they collaborate with, how they build relationships, and their role in facilitating connections Surveys: question if innovators made a connection with relevant actors after testing with Innofest and if yes, with whom Observations: on the network Innofest created and maintains	Innofest employees & innovators	1

			Operating across different institutional boundaries			
	Toppler	How does Innofest actively challenge, disrupt, or undermine the existing dominant system, regime, or established practices? How does Innofest highlight unsustainability, and create urgency for change?	Communicating the negative impacts or unsustainability of the current system Introducing alternatives that compete with existing solutions	Interviews: questions regarding Innofest's strategies Desk research: for an insight in the alternatives Innofest introduces Surveys: on the contribution of innovations to social or sustainable transitions	Innofest employees & innovators	1 & 2
	Supporter	Does Innofest provide essential resources or an experimental environment for the other actors to operate effectively?	Providing funding, infrastructure or expertise The value of the creation of niches where experimentation can take place, without immediate market pressure	Interviews: questions on the resources offered by Innofest Surveys: questions on how the assistance of Innofest helped social innovations Observations: on which resources Innofest offers and how this enables other actors	Innofest employees & innovators	1 & 2

5. Methodology

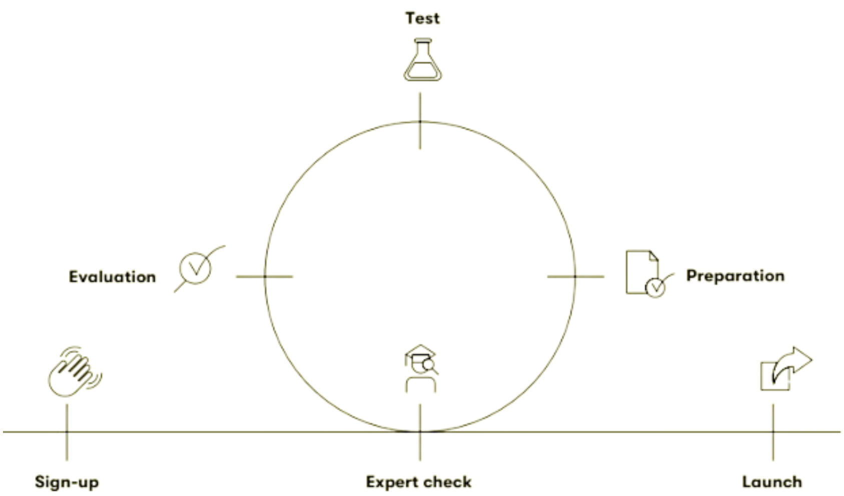
The research aims to understand the role of innovation intermediaries in sustainability transitions. To answer the research question: '*How do innovation intermediaries enable innovations that support sustainability transitions?'* a mixed-methods research design is selected. Chapter five will elaborate on the chosen case and explain the research philosophy, case-study strategy, methods for data collection and –analysis, and the validity and reliability of the research.

5.1 <u>Introducing the case</u>

Innofest is a non-profit organization that supports start-ups with a social or sustainable innovation. These entrepreneurs are referred to as *innovators*. Innovations can either be part of an existing startup wanting to innovate, or the startup can be founded because of this particular innovation. During a festival or at another living lab, innovators can conduct a technical test to see if their innovation works, or they can gather feedback from the visitors. Innovators can test their prototype with Innofest to validate their assumptions about the product or the target group. For example, De Bakezel is an innovator that tested with Innofest during the Bevrijdingsfestival (liberation festival) in Utrecht (BFU) on May fifth, 2025. They invented a festival-proof cart with a renting service to contribute to the circular economy and minimize single-use carts that are not designed to carry heavy festival gear. De Bakezel as a company did not exist before the invention of their festival-proof cart. Visitors at BFU gave their opinion on the design of the cart and the price of the rental service. The eventual goal of the innovations that test with Innofest, is market introduction of their product or service.

Innovators receive guidance through the *Innofest method*. Based on the experience at the internship organization, the researcher gained a profound understanding of this method. The Innofest method is divided into different phases that together create the innovation process that test cases go through. This is called the Innofest Loop and is shown in figure 5.

Figure 5: The Innofest Loop, adopted from Innofest (n.d., p.5).



Before entering the loop, innovators have gotten familiar with Innofest. This often happens through the efforts of scouts, marketing and PR strategies or the diverse partners that Innofest works with. Innofest scouts are experts in finding new innovations that are ready to take the next step towards their market goal. The scouts search for suitable innovations, reach out and connect potential innovators with projects and test experts. Additionally, Innofest works with diverse partners, from living labs to incentive programs, and embeds marketing and PR strategies to reach the desired audience. Innovators can then *sign up* through Innofest's website.

To test with Innofest, an innovation must meet a number of general conditions. Most importantly, there has to be a concrete test question. On top of that, the following conditions apply for participation in a test:

1. The prototype is innovative

2. Testing at a festival offers proven added value
3. The prototype has a viable business model (in the long term)
4. The prototype contributes to a better world

After signing up, the *test experts* check if innovations adhere to these conditions and if there are additional conditions that apply to certain projects. If the test experts see a match with Innofest, innovators enter the next phase in the loop.

To guide innovators in designing a successful test, Innofest offers five sessions in *preparation* of the living lab. In advance of these sessions, innovators fill out a canvas that provides support in designing their test setup. The sessions are:

1. '**Let's Get This Party Started**': During this first session, a collective start is made. All innovators that passed the first selection for a project can ask questions about the testing process and Innofest method. Furthermore, the test expert will go over their test set-up according to their completed canvas. After the first session, a jury appointed specifically for the project – often including people from collaborative partners such as festivals and grant providers - picks the final selection.
2. '**Dig Deeper'**: The second session involves the innovators selected by the jury, accompanied with Innofest's test expert. After a brief group introduction, 1-on-1 discussions are meant to dig deeper into the test design.
3. '**Communication is Key**': Extra attention is paid to communication and PR in this short third session.
4. '**Let's Get Practical**': During 1-on-1 sessions, the test expert, communication expert and producer put together the finishing touches together with the innovators. The latest developments are discussed as the test setup gets more and more definitive.
5. '**Ready to Rumble**': Session five takes place shortly before the test. The preparations are just about over, and this session is used to go over practical issues such as the roadmap and specific information about travel and lodging.

After session five, the test at a festival or other LL takes place. Because every innovation has its own specific issues, Innofest employs a variety of test types. These are the user test, expert review, A/B test, stress test and technical test. The user test is especially suitable for innovations that are meant for the consumer market. Data can be retrieved through in-depth interviews or surveys, or when needed to collect the right data through other methods. With the expert review, the innovation is tested and checked by an expert. This way of testing is especially suitable for complex innovations, such as energy or water innovations. An innovation can be linked to the infrastructure of a Living Lab, and an expert provides the innovator with feedback. The A/B-test compares two situations or innovations. These can be two different products, or the same product in a different environment. The goal of this test is to see which innovation works best or in which environment the innovation performs best. A stress test can be conducted when the goal is to see what the limit of an innovation is. It is used to evaluate what a prototype can withstand. The test is especially suitable for technical innovations with many users, because it can monitor how a prototype performs when there is a large number of users. Lastly, a technical test can be conducted to check if an innovation delivers as expected. With this test, it is crucial to have clear expectations and assumptions beforehand, and to check whether or not the innovations meet them (Innofest, n.d.).

To *evaluate* each test according to a set structure, the final session is shaped to gather feedback on the test and on the Innofest method.

6. '**The Afterparty**': During this 1-on-1 session with the test expert, the innovator reflects on the course of the test and discusses how to analyze the results.

When the evaluation reveals that sufficient evidence has been gathered for the innovation to take the next step, the innovation is ready to *launch*. Innofest stays involved with their alumni to support them in making the right connections with partners from their innovation network. Since 2016, Innofest has supported over 350 innovators in scaling their social or sustainable innovation. To sketch an image of the themes these innovations cover, table 3 presents how many cases Innofest has supported per theme. The themes are construction, circular economy, energy, food, health, social inclusivity, equity & safety, tech and water. These numbers are based on the data made available through the website of Innofest (Innofest, n.d.).

Table 3: Overview of number of innovators per theme.

Theme	**Number of innovators supported by Innofest**
Construction	15
Circular economy	93
Energy	31
Food	53
Health	31
Social inclusivity, equity & safety	57
Tech	80
Water	17

Test locations resemble reality as close as possible, while at the same time these locations often lack strict rules and regulations due to their temporary nature. Therefore, LLs create a space where more is possible than in the 'normal' public space. They provide a suitable environment to test solutions that can eventually make impact in the 'real world' (Innofest, n.d.).

5.2 Research philosophy

The research philosophy concerns the beliefs and assumptions that guide how research is approached. It particularly entails what constitutes valid knowledge, how it is generated and how it should be interpreted. Three elements construct the research philosophy. First, *ontology* refers to the nature of reality and different views a researcher might have on this reality. Second, *epistemology* entails the understanding of reality. In other words, ontology considers what is seen as true or real, and epistemology is concerned with what is known and how it is known. Lastly, *methodology* refers to the methods used to explore these views (Guba & Lincoln, 1994; Moon & Blackman, 2014).

This research has a critical realist research philosophy, following ontological realism. Ontological realism poses that there is an objective reality that exists, independently from actors' perceptions or knowledge of it. However, an actors' knowledge of this reality is always limited, and reality can never be fully or perfectly understood (Zhang, 2022; Bisman, 2010). Critical realism sees reality as stratified: it can entail more than what we can observe. There can be deeper structures and powers that influence superficial events. Deeper layers can entail social structures, values or even laws of physics. These mechanisms exist, whether we observe them or not (Bisman, 2010).

Researchers that follow a critical realistic philosophy often identify underlying mechanism that generate certain events. Furthermore, critical realism's epistemology acknowledges that causal mechanisms can have various outcomes and effects in different contexts. It often is about understanding how mechanisms, contexts and outcomes are interrelated. The term critical refers not only to a critical attitude towards existing theories and assumptions, but also to the potential to identify structures and relations that produce injustice, with the goal of criticizing or even changing them. Because of the acknowledgement of an objective reality and the role of subjective interpretations, critical realistic research often employs mixed research methods, gathering quantitative and qualitative data to sketch a complete image of underlying mechanisms and their outcomes (Moon & Blackman, 2014; Zhang, 2022).

5.3 Research strategy and methods

A qualitative case study research strategy is employed to answer the research questions. A case study is beneficial in researching a complex, contemporary phenomenon in its natural context, especially with 'how' and 'what' questions (Yin, 2018). This research - looking at the role of Innofest - aligns with these characteristics.

A single case study is conducted, focusing on one case, that is Innofest. Furthermore, the research is inductive, descriptive and exploratory. It aims to analyze the role of Innofest in detail and explore the impact of this role or multiple roles. Innofest is selected as a case because they are the only non-profit organization in the Netherlands that act as an innovation intermediary for social innovations. Therefore, they are a unique case in their context – that of the Dutch innovation network. The unit of analysis is how Innofest acts as an innovation intermediary to enable social innovations that support sustainability transitions.

5.4 Data collection

Desk research contextualizes the case within the broader literature about sustainability transitions and corresponding theories. It is used to connect the observations at the micro-level with the meso- and macro-level. This means that the case at the micro-level can be positioned in the broader innovation landscape using literature. Sources that are used for desk research are academic articles and in rare cases publications of Innofest itself.

During the data collection, three different data sources are used, also known as triangulation, to strengthen the validity of the research. First, two surveys are employed to gain the innovators' perspective on the perceived role of Innofest and impact on the social innovation. These surveys are drawn up and conducted by Innofest and consist of open questions and multiple choice questions. Their goal is to gain an understanding of the influence that Innofest has on the development of an innovation, and to be able to gather, organize and share data on this development with funding partners. Survey 1 (appendix 4.1.) is conducted directly after an innovator completes a test with Innofest. It has been filled out by 136 respondents over a period of 7 years, from 2018 until now. Survey 2 (appendix 4.2) is conducted once every two years and has been sent out for the first time in 2023. It has been filled out by 190 respondents. This is a total of 326 surveys. Data on when exactly these surveys have been filled out is missing. Furthermore, there might be an overlap in the respondents, since some innovators that filled out survey 1, have also filled out survey 2. However, since these surveys cover different questions and are meant to gain an understanding of the role of Innofest based on a large number of respondents, instead of focusing specifically on a few innovations, these are not filtered out and all survey results are used in the research. Lastly, Survey 2 has been sent out in 2023, when Covid-19 was still causing many strict rules and regulations concerning the festival sector. It has to be considered that the long-term development of these innovations is not representative due to these restrictions.

Second, participatory observation in the form of a 6-month internship, from 04-02-2025 until 03-07-2025, at the case study organization provides the researcher with rich information and a deep understanding of the case. During the internship, the researcher attended several weekly and bi-weekly meetings. Additionally, project-specific meetings were attended less frequently, and mainly in preparation for the test in a LL. During three LLs, the researcher was present to support team Innofest and the innovators in successfully executing the tests. The researcher furthermore organized the so-called 'innovation tour' during these three LLs. During an innovation tour, partners of Innofest and other interested actors walk along the innovators with a silent-disco headset on, guided by one of Innofest's employees. The project lead interviews the innovators at their test site, and participants can ask questions. An overview of the meetings and tests attended can be found below in table 4.

Table 4: Formal participatory observations; table of meetings and events attended by researcher during internship.

	Meeting	**Frequency**	**Date**	**Duration**	**Content**
1.	Communication catch-up	Weekly	From 03/02/2025 until 28/07/2025	30-45 minutes	State of affairs, progress on ongoing projects, division of tasks for upcoming week.
2.	Kleine kern	Bi-weekly	From 06/02/2025 until 24/07/2025	60 minutes	Personal updates: how do you feel, personal and work-related achievements of the last two weeks. State of affairs and progress of all ongoing

					projects and new business.
3.	Stand-up	Bi-weekly	From 13/02/2025 until 31/07/2025	30 minutes	Who has what focus the upcoming week.
4.	Project meetings BFU ‘25	Trice	09/04/2025, 24/04/2025, 01/05/2025	45 minutes	State of affairs of innovators and tests.
5.	Meetings Crossroads ‘25	Weekly	From 23/04/2025 until 17/7/2025	30 minutes	State of affairs concerning the organization of the Innofest matchmaking event.
6.	Project meeting Op de Ring ‘25	Once	28/04/2025	45 minutes	State of affairs of innovators and tests.
7.	Project meetings Concert at SEA ‘25	Twice	01/05/2025, 22/05/2025	45 minutes	State of affairs of innovators and tests.
8.	Project meetings TT Festival ‘25	Trice	23/04/2025, 13/05/2025, 23/06/2025	45 minutes	State of affairs of innovators and tests.
9.	Project meeting Kwaku Festival ‘25	Once	22/07/2025	45 minutes	State of affairs of innovators and tests.
10.	Testing at BFU ‘25	Once	05/05/2025	1 day	Testing at BFU Festival in Utrecht with five innovators.
11.	Innovation tour BFU ‘25	Once	05/05/2025	2 hours	Tour with partners and interested actors visiting the five tests, led by the researcher, executed by the project lead.
12.	Testing at TT Festival ‘25	Once	27/06/2025-28/06/2025	2 days	Testing at TT Festival in Assen with five innovators.
13.	Innovation tour TT Festival ‘25	Once	27/06/2025	1.5 hour	Tour with partners and interested actors visiting the five tests, led by the researcher, executed by the project lead.
14.	Event at Crossroads ‘25	Once	02/07/2025	1 day	Matchmaking event with 14 alumni during Crossroads 2025 in Utrecht.
15.	Testing at Kwaku Festival ‘25	Once	02/08/2025-03/08/2025	2 days	Testing at Kwaku Festival in Amsterdam with six innovators.

16.	Innovation tour Kwaku Festival ‘25	Once	02/08/2025	2 hours	Tour with partners and interested actors visiting the six tests, led by the researcher, executed by the project lead.

For a 3-month period during the 6-month internship, the researcher fulfilled the role of project assistant for the whole organization. The researcher supported the innovators and team Innofest, with tasks including being the main point of contact for the innovators, preparing documents and meetings and making sure the project leads could ensure smooth tests. An overview of the innovators that Innofest guided during the internship period and that the researcher contributed to, is provided in table 5.

Table 5: Innovators guided during the internship.

	Innovator	**Innovation**	**Tested at**	**Theme**
1.	Rinse&Go	Rinsing station for reusable cups	BFU ‘25	Tech, Circular
2.	Stamps	App that enables users to share personal stories with people close to them	BFU ‘25	Health, Social inclusion, equity & safety
3.	Green Wine Company	Reusable wine bottles with a deposit	BFU ‘25	Circular, Food
4.	Roods	App that turns a location into an interactive museum	BFU ‘25	Social inclusion, equity & safety
5.	De Bakezel	Festival proof cart (‘bolderkar’) with rent service	BFU ‘25	Circular
6.	RentGlam	Rent platform for glitter dresses	Op de Ring ‘25	Circular
7.	Veldboom studios	3D-printed 45 km sportscar	Op de Ring ‘25	Energy, Social inclusion, equity & safety
8.	Sustained Collective	Reusable T-shirts designed specifically for events, paired with a washable, bio-based ink	Op de Ring ‘25	Circular
9.	Food for Skin	Sunscreen without chemicals	Op de Ring ‘25	Circular, Health
10.	Neardoor.club	Sport events social app. With AI-Powered Matching: to match users with local sports activities, communities and clubs	Op de Ring ‘25	Health, Social inclusion,

				equity & safety
11.	App4Support	App that provides youth sport strainers with tips to pedagogically responsible deal with difficult-to-understand behavior of children on the field	TT Festival '25	Health, Social inclusion, equity & safety
12.	CC Diagnostics	Detect cervical cancer before it's there with an implement laboratory-test called Methica CC kit	TT Festival '25	Health
13.	Folded Solar	Modular and foldable solar system with an optionally integrated battery	TT Festival '25	Energy
14.	Nowaste Oat Bar	No waste energy oat bar made from residual streams	TT Festival '25	Health, Food, Circular
15.	Green Gear	Bags and other products made of left-behind camping gear (air mattresses, tents, etc.)	TT Festival '25	Circular
16.	Loverendale Ter Linde	'Mattentaart'; a specific kind of pie made on the biological farm of Loverendale Ter Linde	Concert at SEA '25	Food
17.	Oostamo	Flavor bags for cold water made of plants from regenerative farms	Concert at SEA '25	Food
18.	Vermeersen	Locally brew kombucha	Concert at SEA '25	Food
19.	Wearable Breathing Trainer	Breathing trainer for children, processed into a t-shirt	Zwarte Cross '25	Health
20.	Brood op zijn retour	Sugary bread-paste from returned bread	Zwarte Cross '25	Circular, Food
21.	Gronings feestmaal & Visto	1. Gronings feestmaal: food truck to start conversation on (healthy) food 2. Visto: Research tool to gather text and images	Zwarte Cross '25	Food
22.	Buurtboost	Platform for residents that live close to a festival location: resident portal with job opportunities at the festival, local business opportunities, community voting to shape event elements	Kwaku Festival '25 (MDT)	Social inclusion, equity & safety, Tech
23.	Soaploop	Circular hand soap made of beef tallow	Kwaku Festival '25 (MDT)	Circular
24.	Wellvest	Booking platform for independent beauty and wellness professionals	Kwaku Festival '25 (MDT)	Tech
25.	Noord See Lights	3D printed lamps	Kwaku Festival '25 (MRA)	Circular

26.	Ommetje met Tom	App with educational walks, focused on Amsterdam	Kwaku Festival ’25 (MRA)	Health, Social inclusion, equity & safety
27.	Queertopia/WERQ	Gym with sports lessons for the queer community	Kwaku Festival ’25 (MRA)	Health, Social inclusion, equity & safety
28.	Anticipai	AI safety analysis on the basis of a camera analysis, created for production factories	Kwaku Festival ’25 (MRA)	Social inclusion, equity & safety, Tech
29.	CoinKids	App that learns children to save money and that helps them develop smart money habits	Kwaku Festival ’25 (MRA)	Social inclusion, equity & safety, Tech
30.	Ilanga Studio	Color/paint clothes with natural paint made of food waste	Kwaku Festival ’25 (MRA)	Circular, Tech, Food
31.	JAT Technologies B.V.	Event platform with ticketing, live streaming and fan engagement in one system	Kwaku Festival ’25 (MRA)	Tech

Additionally, many informal conversations that were held during the internship have enriched the researcher’s knowledge on the case of Innofest. The researcher’s activities during the internship have provided an in-depth understanding of not only Innofest itself, but also of the innovators and other relevant actors within the innovation network.

Lastly, the data from the surveys and observations is enriched by semi-structured expert interviews, conducted with Innofest employees. Semi-structured interviews provide flexibility to ask further in-depth questions whilst adhering to a predetermined topic list that ensures all relevant topics are discussed. The research aims to collect context-specific information on how Innofest enables social innovations, and how this role is perceived by actors involved. Through the process-oriented and complex character of social innovations, it is needed that the interviews have space to discover perceptions and experiences. These are hard to grasp with standardized methods. Four interviews are conducted with employees in various functions to gain different perspectives through purposive sampling. The interviews are conducted until satisfaction with the collected data is reached, they are conducted online, are recorded and transcribed. While the interviews and surveys are both conducted in Dutch, the transcripts and data sets are also available in Dutch. All interviewees provided consent to be referred to by their name and that their function can be mentioned. Table 6 presents an overview of the interviews.

Table 6: Overview of interviews.

Interviewee	**Function**	**Date**	**Time**
Benthe	Project lead	28/05/2025	15:00-15:45
Cher	Head of communications	02/06/2025	13:00-13:45
Kjel	Test expert	04/06/2025	11:30-12:00
David	New Business lead	10/06/2025	11:00-11:30

As project lead, Benthe is in contact with funding partners and the festivals that Innofest collaborates with. She ensures that projects run smoothly, and everyone can do their job. Head of communications Cher guides the innovators with their communications, the visual aspects of their test and she decides how Innofest presents the innovators on social media and their website. Test expert Kjel provides substantial guidance to innovators in designing their test and makes sure that they can collect the right data. Lastly, New Business lead David actively searches for business opportunities to secure funding for projects.

5.5 Data analysis

The interviews are literally transcribed, and all interviews and open questions of the surveys are organized and thematically coded in ATLAS.ti. However, while finalizing the thesis, ATLAS.ti malfunctioned, and the coded documents were lost. Therefore, the data was again coded manually, applying themes to the unstructured texts. Below, the whole process of thematic coding is explained to elaborate on the researchers' full analysis process.

Thematic coding allows the researcher to compare qualitative and quantitative data. By doing so, the researcher increases the validity and reliability of the findings. In this research, the data on the role of Innofest and its impact on social innovations as explained by Innofest employees and observed by the researcher, is compared to the quantitative survey data from the innovators. Furthermore, thematic coding helps to construct a logical narrative by integrating the qualitative themes into the presentation of the quantitative findings. Codes will be applied to the unstructured text of the interviews and surveys, providing a structured overview that identifies and visualizes the content. A thematic analysis according to the six phases provided by Braun & Clarke (2006) is conducted. These six phases are:

1. Familiarizing yourself with the data
2. Generating initial codes
3. Searching for themes
4. Reviewing themes
5. Defining and naming themes
6. Producing the report

The coding is an iterative process, where the researcher can go back and forth between these phases. The coding process starts with reading the transcripts and survey answers assigning them with a label (code). These codes imply the main theme of a relevant fragment. In phase two, also known as axial coding, fragments with corresponding codes are compared to each other (Williams & Moser, 2019). All data relevant to each other is collated into potential themes. When the themes are specified, they can be linked to each other to formulate an answer to the research question. The closed survey questions will generate graphs and tables which are employed for the analysis.

5.6 Validity and reliability

The validity of the research refers to the accuracy of the findings. This can be divided into internal and external validity (Cohen et al., 2017). The internal validity will be guaranteed through data and method triangulation. Triangulation refers to "the use of multiple methods or data sources in qualitative research to develop a comprehensive understanding of phenomena" (Carter et al., 2014, p. 545). It is also used to test the validity of information through the use of multiple sources. This research will conduct triangulation by using three different data sources: interviews, surveys and participatory observations. Furthermore, multiple theoretical frameworks and perspectives will be used to enhance the depth of the research and information is checked through various sources. The researchers' interpretations are presented to the participants of the interviews in a member check, verifying the data with the respondent. Lastly, during the research, the collected data and the interpretations made by the researcher have been presented to the thesis supervisor and fellow students, ensuring a peer debrief.

A limitation of the research is the lack of generalizability due to the single case study research design. To ensure the external validity of the research, a rich, detailed description of the case and context is brought forth, giving other researchers the opportunity to assess whether the findings might be relevant for their own context. Lastly, the reliability of the research refers to the consistency of the findings and if they can be reproduced (Cohen et al., 2017). To ensure reliability, research goals and questions are defined before the research is conducted. A detailed methodology chapter is included in the research to explain the choices made by the researcher. Furthermore, the research makes use of an interview guide (Appendix 3) and transcript, allowing the interviews to be replicated in the future. The survey questions are provided in Appendix 4. By applying these measures, the accuracy and consistency of the research are ensured.

The possible retro perspective of the innovators has to be considered when analyzing the survey data. Since the survey is filled out based on memories, the answers can differ from reality. However, since this is a mixed-methods research and it aims to understand a phenomenon based on interactions and perceptions, the data is adequate for the purpose of this research.

6. Results

This chapter presents the findings derived from the research conducted. Following the methodology outlined in Chapter 5, the data collected through surveys, observations and interviews is analyzed using thematic analysis. The primary objective of this chapter is to systematically report the outcomes of this analysis, addressing the research questions posed in Chapter 2. This chapter will lay the groundwork for an answer to the main research question in Chapter 7 and comprehensive discussion in Chapter 8.

6.1 Roles of innovation intermediaries

To answer the first sub-question '*What roles do innovation intermediaries adopt in supporting the development of social innovations?*', several key aspects of Innofest's activities are elucidated. First, Innofest's activities are further explained, from the selection process to the guidance of alumni. Relevant partners and other actors are highlighted to gain an understanding of the relationship between actors and the roles that are fulfilled by these actors in Innofest's testing process Then, a detailed examination of Innofest's activities through the lens of transition roles as defined by De Haan & Rotmans (2017) is conducted in order to evaluate which role(s) Innofest adopts.

As explained by David, actors within Innofest's innovation network can be categorized into different categories. These are financers, Living Labs, innovators and parties that can deliver innovators, such as incubators, accelerators and knowledge institutions. Knowledge institutions are twofold, since they can also act as a financer. Furthermore, there are corporates and funds. A critical aspect of Innofest's operational model is its ability to secure funding from diverse partners. To determine whether or not an actor is a viable funding partner, David checks if they align with Innofest's values and if Innofest aligns with theirs. He then examines whether and how Innofest can help reach certain goals attached to the funding. He explains: "*First, I look at the categories: do [the partners] fall into one of them? Then, I look at what their goals and objectives are. Do they align with us? Are they social or sustainable? Next, I look at how we – with the resources and the network that we have – can help them in reaching their goals. And to make sure they can provide us with funding.*" Innofest actively monitors which funding opportunities arise within the innovation network. A funding partner often has a budget available with certain requirements attached to receiving it. "*For example, the Municipality of Utrecht has three themes that they focus on. These are healthy people, valuable digitalization and a future-proof, resilient living environment. Every region or every city has its own set of themes that they focus on. And they free up budget to reach these goals within those certain themes. And that can be done through a lot of things, but one of them is innovation. Thus, the Municipality of Utrecht wrote out a subsidy scheme with which they focus on all parties that work with sustainable or social innovations, to accelerate these transitions. We applied for this subsidy and were granted it*", David says. Benthe further explains: "*Sometimes, there are certain conditions attached to these subsidies, which means that we have to test in a certain region in the Netherlands, for example, or that the entrepreneurs have to adhere to certain conditions. This influences the festival [that we test at].*"

After Innofest is granted a subsidy, they set up a project with different actors. A project entails the process from receiving funding to wrapping up the sessions with innovators and involves all actors that enable testing at a Living Lab, from funding partners to festival.

However, one financer is often not able to fund all costs of a project. David explains: "*The challenge often is not finding a Living Lab; it is finding funding*". Therefore, he actively seeks opportunities to provide the full funding. To reach this goal, he writes grant applications, closes partnerships, visits networking events and tries to get a picture of every actor in the innovation network that has something to do, or could get involved, in funding one of Innofest's projects. Then, other funding partners are approached and eventually involved in the project, ensuring the full funding. "*We set up a project from the money that we received [from the Municipality of Utrecht]. That is in collaboration with a few other partners. In this case these are the Province of Utrecht, the Utrecht University of Applied Sciences, ROM Utrecht and Startup Utrecht. And every actor contributes something [to the collaboration], either money or expertise. Together, this forms the ValidationLab Utrecht. A ValidationLab is essentially a collaboration between all parties in a certain ecosystem, including the [Living Lab].*" Included in a ValidationLab are actors that provide a Living Lab, such as Crossroads or Bevrijdingsfestival Utrecht. They are selected to match the themes and target groups of the funding. For ValidationLab Utrecht, for example, the Living Labs are events in the Province of Utrecht. For other projects, other requirements apply. After a project is set up, innovators that match the goals linked to the funding are selected. They then start the process of setting up a test and validating their assumptions in a Living Lab. An overview of the projects and corresponding financial actors is shown in table 7.

Table 7: Funding partners in the innovation network of Innofest. Based on the interviews and Innofest (n.d.).

Project	**Funding partners**
ValidationLab Utrecht	Utrecht University of Applied Sciences Municipality of Utrecht Province of Utrecht
'Zeeland in stroomversnelling' (Zeeland in acceleration)	Province of Zeeland
Stimulate innovation on themes	ClickNL Ministry of Education, Culture and Science
ValidationLab North Netherlands	Founded NL Municipality of Groningen Province of Groningen Municipality of Assen Province of Friesland
ValidationLab Metropolitan Area Amsterdam	Municipality of Amsterdam
ValidationLab Energy cases	Foundation Goeie Grutten
Method Validationsprint	HZ University of Applied Sciences
Practice-oriented research	Sportinnovator Regieorgaan SIA
ValidationLab Zeeland	Province of Zeeland HZ University of Applied Sciences FoodDelta Zeeland

As a non-profit organization, Innofest is heavily reliant on the external financial support to provide services to innovators, who often lack the necessary capital for in-depth testing and validation, as became clear during the participatory observations. According to Benthe, this is a very important aspect of Innofest's method. Benthe explains: "*Of course, we cannot exist without our funding partners… Because we are the only organization in the Netherlands that supports innovations in this way, our partners are crucial. Without them, we would not be able to do what we do."* This emphasizes the foundational role of funding partners in enabling Innofest's unique value proposition.

A detailed examination of Innofest's activities, especially through the lens of transition roles as defined by De Haan & Rotmans (2017), reveals a dynamic and multi-faceted engagement. The extensive preparatory phase recognizes Innofest as a *connector*, acting as a bridge between various actors in the innovation network. Innofest connects financers and innovators based on specific themes, innovators and LLs based on a project's requirements and multiple partners within a project to ensure a project's full funding and successful execution. The activities employed to then support the development of social innovations differ depending on the phase of an innovation, and the phase in the testing process.

To track the progress of a new technology or the technological dimensions of a new product and thus indicate the phases of innovation and product development, the Technology Readiness Level (TRL) scale is employed, as explained by Benthe, David and Kjel. It evaluates technology using a set of indicators that range from 1 to 9, elaborated in table 7.

Table 8: Technology Readiness Levels, based on the interviews and RVO (2022).

Level 1: Fundamental research	Research is conducted on the innovative idea and the basic principles of the innovation. Conducting fundamental- and desk research.
Level 2: Applied research	Formulation of the technological concept and the practical application. Mostly experimental and/or analytical research.
Level 3: Testing of concept	Testing the applicability of the concept on experimental basis (experimental proof of concept). Testing and validating hypotheses on different components of the concept.
Level 4: Implementation and test prototype	Test in lab environment. A prototype developed in this phase is relatively cheap and easy to develop and therefore not close to the final product, process or service.
Level 5: Validation prototype	Testing the technological concept in a relevant environment. A prototype developed in this phase is time- intensive and expensive and therefore close to the final product or system.
Level 6: Demonstration prototype in test environment	The concept is tested and demonstrated in a relevant testing environment. Testing takes place after technical validation in a relevant (pilot) environment, such as a testing ground.
Level 7: Demonstration prototype in operational environment	The concept is tested and demonstrated in a user-environment to prove the efficiency in an operational environment.

Level 8: Product/service is complete and operational, ready for market introduction	The innovation will evolve into its final form. The technological efficiency has been tested and is proven to meet expectations, qualifications and norms. Financial frameworks for production and launch are determined.
Level 9: Market introduction	The innovation launched in the desired market environment.

While Innofest aims to support innovations across all TRLs, their primary focus is on innovations in TRL 4, 5, and 6, where a prototype or concept is ready for validation. According to Benthe, it is essential that innovators that apply already have a prototype or idea that they can validate. This aligns with their core method of facilitating real-life testing. "*The basis of the Innofest method is supporting an innovator in testing to validate a prototype or concept. This can be done in different ways and in different phases of the development of an innovation",* David explains.

However, Innofest also engages with earlier TRLs through initiatives like the MDT (Maatschappelijke Dienst Tijd; Community Service) projects. Based on the participatory observations, an understanding of the role of Innofest in these projects is created. MDT entails a period of voluntary service to society, from youngsters between the ages of 12 and 30. In the collaborative projects of Innofest and MDT, students develop innovative solutions for societal issues and receive guidance to create a prototype. This guidance is mainly provided by the Amsterdam University of Applied Sciences, but Innofest provides the students with sessions from the Innofest method to support their development. They then step up to support the testing of these early-stage prototypes at Living Labs. The innovations from the MDT project are innovation 22, 23 and 24 in table 5. In this context and based on the experience during the internship, Innofest acts as a *frontrunner* by stimulating the invention of new, innovative solutions to contemporary problems, even if they don't originate the core idea. They invest resources in these uncertain ventures by facilitating their testing, fostering a fertile ground for emerging novel ideas.

The core of Innofest's method lies in validating existing prototypes (TRL 4-6) with real-life users at Living Labs. This involves a collaborative design of the test, where Innofest's team works closely with innovators to refine test goals and optimize the test site for visitor engagement. In this phase, the Living Lab is a testing environment that is as close to reality as possible, but it could be that a link to the environment the innovation will eventually be applied in is lacking. Benthe explains: "*For example, a technical test that we did was with an entrepreneur that developed a product for demented elderly. They developed a pillow that detects stress, and tested this with people that were not demented, like the crew at the festival. The test was focused on if the sensors in the pillow were accurate with the data they saw on their laptop*." For this goal, it was not necessary to conduct the test in the actual environment the innovation is designed for. In this phase, Innofest predominantly embodies the role of a *connector*. They strategically link innovators, who often receive funding through Innofest, with appropriate Living Labs and their audiences. Furthermore, they facilitate connections to potential partners, customers, or other clients.

Innovations in TRL 7 can be tested in an operational environment. Instead of the test environment, this is an environment that the innovation will eventually be applied in. As Cher suggests, for social and societal innovations the "*time capsule*" of festival testing might be too short, indicating a need for longer test trajectories to yield substantial results. Based on the participatory observations, this is an area of expertise that Innofest is not an expert in yet, but they are working on expanding their activities to include long-cyclical testing in their method. This means that an innovation that is meant to be used in a neighborhood, for example, is also tested in a neighborhood. Furthermore, the focus shifts from tests that last a few days - the length of a festival - to tests that last a few months. More data can be collected during long-cyclical tests, and the innovation can even be adjusted during the test, going back and forth in the innovation cycle while testing. These tests focus less on the opinion of a large group on an innovation and focus more on if the innovation works in the desired environment and for the desired target group. The initiation of a project, with funding partners and scouting innovations, is the same for the tests in an operational environment, as it is for the shorter tests at a festival. Innofest is setting up their first project with long-cyclical tests as we speak. The role of a *connector* can again be recognized in Innofest's activities concerning innovations in TRL 7, connecting innovators with test locations, funding partners and their target group.

For innovators that are ready for market entry or that already launched their innovation (TRL 8-9), Innofest organizes matchmaking events, connecting them with investors or policymakers. Based on the experience of the researcher in organizing a matchmaking event at Crossroads in Utrecht (number 5 and 14 in table 4), the continuous role as a *connector*, even in later stages, facilitating access to capital and strategic partnerships, can be recognized. Furthermore, while still developing in some areas, Innofest's aim to support innovations throughout their entire lifecycle, including market entry, positions them as a *supporter*. They provide crucial resources and an experimental environment without immediate market pressure, acting as an incubator for growth. This continuous support loop, from initial validation to market readiness, is crucial for overcoming common innovation barriers such as limited access to funding and consumer resistance, as respondents from the survey highlight. One respondent states: "*[I now know] that people are not (yet) willing to pay the amount that I had in mind for the products. They do want to pay this when I make some adjustments.*" Another respondent says: "*We learned how our preparations translate to a live audience, and how our product was received by different groups. This not only provided us with insights in potential clients, but also in valuable networking contacts.*" Other respondents explain: *"Testing our projects during a major festival proved to be a valuable decision, as it exposed us to a wide array of challenges and diverse clientele. This approach enabled us to gain a multifaceted perspective of the market."* And "*The test gave us a huge push in the right direction, with which we can work on improving the product-market fit.*" Another respondent adds: "*We got into touch with other potential projects and several experts/advisors that are really helpful and valuable*."

A little over 50% of the innovators that filled out Survey 2 (Appendix 4) indicate that they gained new customers, clients, or collaborations since their participation in the Innofest method. Some clearly state that these are a direct consequence of their test with Innofest, with new clients being the festival that was employed as Living Lab for their test. Other new connections are with government organizations, caterers, private buyers, wholesalers, event locations or supermarkets.

Finally, Innofest actively engages in knowledge sharing through workshops and inspiration sessions. They disseminate their expertise on Living Lab testing and their unique method to municipalities, universities, and event organizers, according to Kjel. This proactive dissemination of knowledge and best practices further solidifies their role as a *supporter*, contributing to the broader innovation ecosystem and empowering other actors to foster social innovation. While the role of a *toppler* is not highlighted as a primary function, Innofest implicitly contributes by supporting alternatives that, if scaled, could challenge unsustainable incumbent practices. Their primary focus, however, remains on enabling the emergence and diffusion of new, sustainable solutions rather than direct confrontation with established regimes.

While budget cuts by governments and knowledge institutions are increasingly occurring, in the future Innofest will need to secure funding through different methods, influencing the service they now offer. To respond to these budget cuts, Innofest is working towards an online method. Innofest is currently in the process of exploring how this new online model will take shape. They are recording the expert videos and designing the online learning environment that will be available on short notice. David explains: "*To see how [innovators] can test autonomously, with our guidance, but then online, we are working on the BE Future project. I personally really believe in this [way of working]. And I think that this is a new transition, with which we can make more impact on a larger scale, and at lower costs. And I think that this will be the new role of Innofest to make an impact."* In examining these different approaches, Innofest adopts the role of a *frontrunner.* The online model is not just a modification of their existing method, but it is the origination a new transition in how they support innovation, in response to external pressures like budget cuts. By developing this online model and designing the learning environment, Innofest is actively initiating a new way of working, a characteristic of a frontrunner.

To summarize, Innofest employs a comprehensive set of activities, from initial test design consultation and diverse testing methodologies to strategic post-test support and matchmaking. These mechanisms are specifically designed to enable innovators to collect actionable feedback, validate their assumptions, and refine their social innovations, thereby significantly increasing their probability of success and ultimately accelerating their contribution to sustainability transitions. Innofest primarily functions as a *connector*, bridging innovators with funding, Living Labs, and market opportunities. They also act as a *supporter* by providing essential resources and expertise throughout various TRLs, and occasionally as a *frontrunner* by fostering early-stage innovation and developing a new online model.

6.2 Innovation intermediaries in transitions

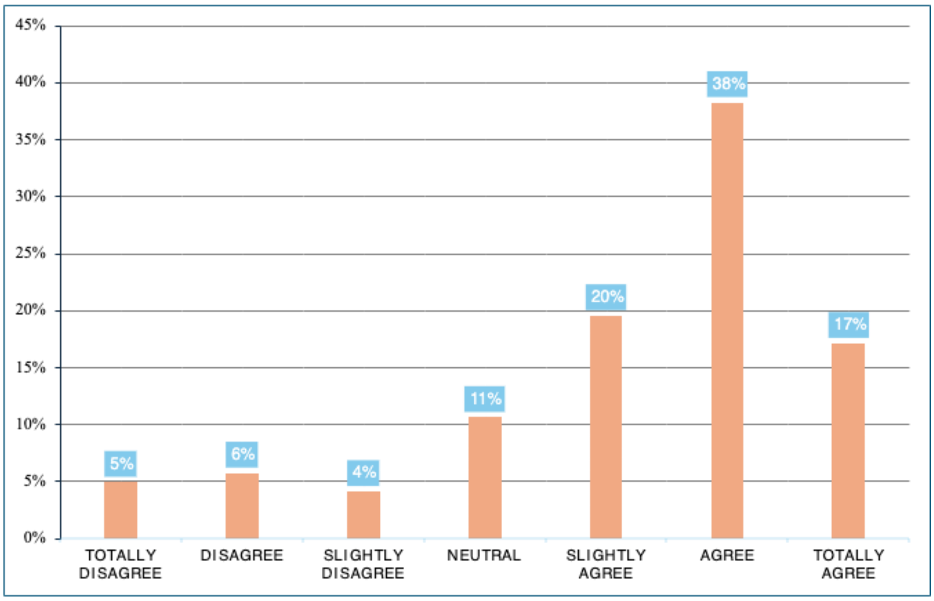
The second and final sub-question '*How do innovation intermediaries contribute to sustainability transitions?*' is answered by explicating how social innovations influence sustainability transitions, and considering the impact Innofest has on these innovations.

Innovations often fail because an innovator is not aware of market demands. Innofest's method is equipped to gather feedback from respondents that are not familiar with the product or innovator, and offers innovators insights into their problem, product and market demand as early on in the innovation cycle as possible. As David explains: "*I think we make an essential contribution, especially for the impactful innovators. To ensure that they realize as soon as possible: I should adjust this, or I should not be doing this at all."* There are a number of aspects that can and should be tested before a prototype is made definitive and the product is sold. David explains: "*Often innovators fail because there is no product-market fit. You think you developed something great. You test that with your mom and dad. They say: that's cool, keep it up! And then you want to generate paying customers. At that point you find out that there is no market at all; there is no demand. When you reach that point, you invested a lot of money, time and energy. And it is better to pull that forward and validate [these assumptions] in the beginning."* Benthe adds: *"It is essential to ask more people that you don't know if the product is actually good. Or that the problem that you want to solve actually exists. Besides this, if the problem is technical, it is also important to test the technology in real-life circumstances."*

By providing innovators with these insights, the probability of success increases. David says: "*90% of innovations fail. That is a waste of time, money, energy, but also of impact. Especially for impactful innovations that can really make the world a better place. Therefore, we say: let's help those innovations to make the world better and reduce the probability of failure by supporting them in testing.*" Benthe states: *"By supporting new entrepreneurs in testing their prototypes, they can make better steps towards the market to find the right product-market fit. That will help more entrepreneurs to succeed."* Kjel adds: *"I think that we, as Innofest, make a positive impact by enabling those innovators in better testing and validating their innovations. . . . Because of that, they can adjust their innovations to better align with market needs and with needed technical specifications. Causing them to be more successful."*

Figure 6 demonstrates that 74.8% of innovators who completed Survey 2 either "slightly agree," "agree," or "totally agree" that testing with Innofest in a Living Lab is crucial for the development of their company. This strong endorsement underscores the perceived value of Innofest's structured support and access to Living Lab environments.

Figure 6: Testing with Innofest in a Living Lab is crucial for the development of my company.



Innofest's goal essentially is to support innovators in becoming successful. By testing, an innovator can accelerate their innovation. Kjel explains: "*85% of innovators [that test with Innofest] accelerate their innovation. That is based on the TRL-levels, where they indicate that they have taken a step forward in successful market introduction.*" The surveys indicate the phases of an innovation before their test with Innofest and after their test. These phases do not directly align with the TRL scale but do give a clear indication of the development of the innovation. Survey data shows a significant shift in the phase of innovations before and after their test. Figure 7 shows the distribution of phases before testing with Innofest, indicating a spread across various stages, with a notable presence in the phase 'Testing of rough prototype/system' and 'Ready for market'. In Survey 2 (figure 8), a positive shift is observed: 32.1% of innovations have successfully been introduced to the market, and another 32.7% is ready for market entry. This substantial progression points to Innofest's efficacy in accelerating innovation development and bridging the gap between prototype and market adoption.

Figure 7: Phase of innovation before testing with Innofest.

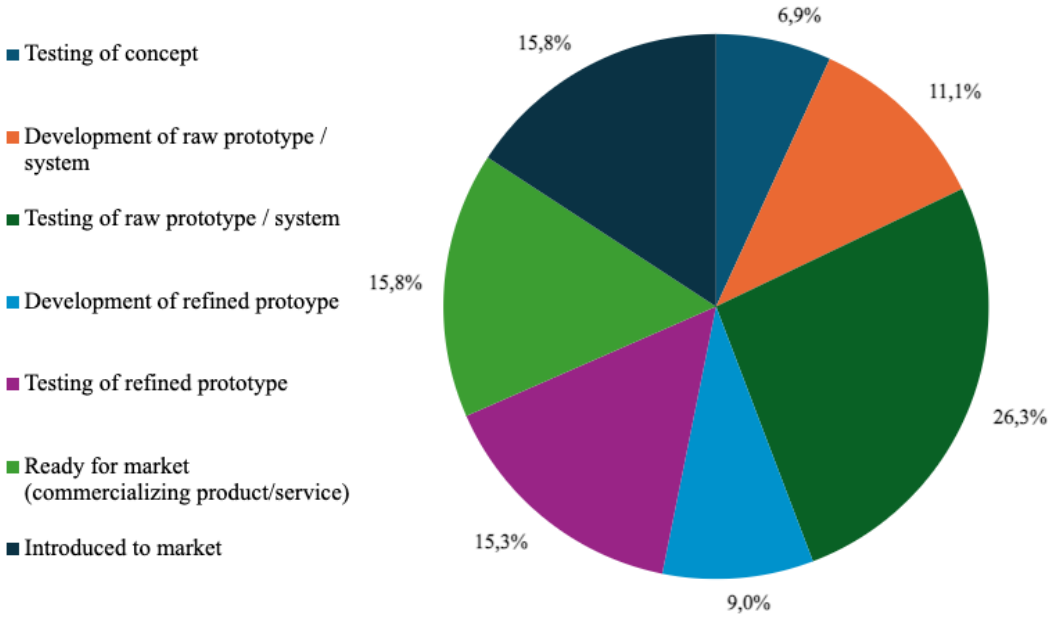
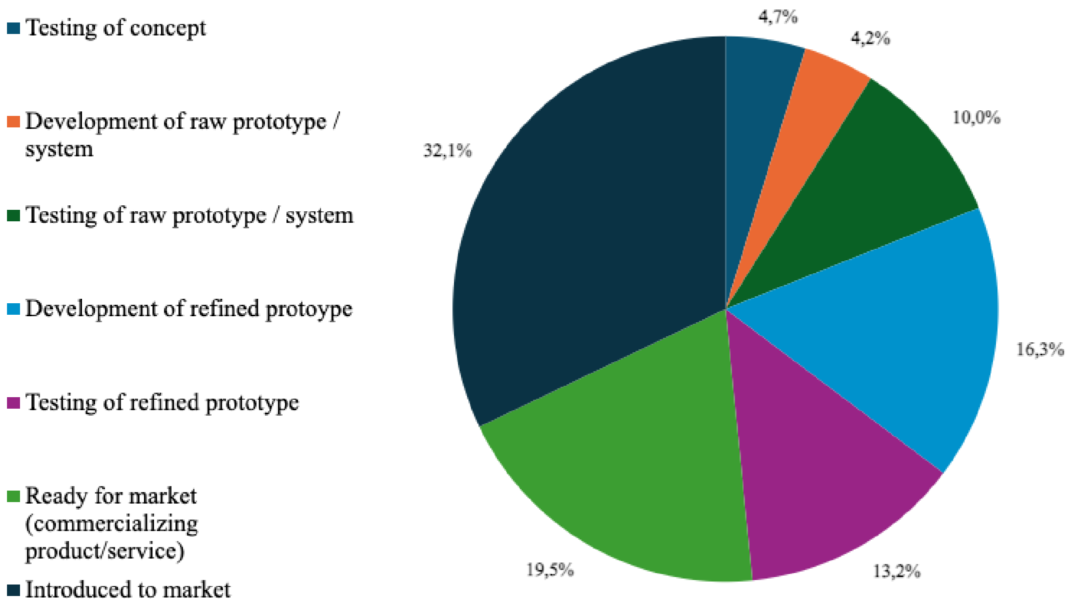


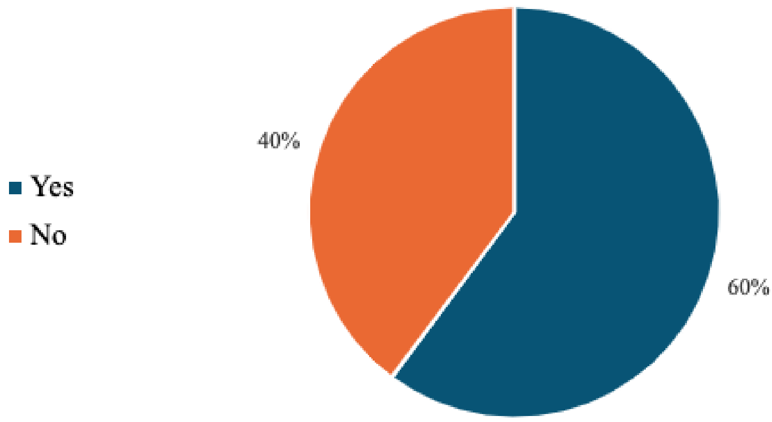
Figure 8: Phase of innovation after testing with Innofest.



Beyond financer requirements, the core criteria for Innofest's selection process are two-fold: the innovation must contribute to a better world and testing at a festival (or other Living Lab) must offer clear added value for the innovation's development. Based on the researcher's experience, in practice, contributing to a better world implies innovations that have the potential to contribute to sustainable and/or social transitions. David states: "*A core criteria for participation in the Innofest program is [that an innovation is] social. In that way, we try to accelerate social transitions by helping those innovations*".

While the data does not provide a clear division between innovations supporting "sustainable" versus "social" transitions, the aggregate impact is notable. The Survey 2 results (figure 9) show that 60% of participating innovators reported contributing to sustainable or social transitions. The reported impacts range widely, from reducing meat consumption and saving drinking water to decreasing CO2 emissions. However, the exact, quantifiable impact is often challenging to measure, as highlighted by the 40% who stated "no contribution" often citing that the product was not yet on the market or that impact was difficult to ascertain. As stated by respondents from Survey 2: "*The concept was not developed, it is back to the first phase, so it did not contribute…", "Indirectly, yes [we contributed to the social or sustainable transitions], but I do not dare to quantify that", "Potentially, but in practice not yet*", "*Yes, but it is hard to measure in our case*" and "*Hard to say, even though we work very sustainably.*" This points to a recognized challenge in measuring the systemic impact of individual innovations, especially those in early developmental stages.

Figure 9: Did your innovation contribute to the social or sustainable transitions?



The survey results highlight an impact made by the innovators that are supported by Innofest. They, in turn, can contribute to transitions. The interviews underscore the indirect role of Innofest in sustainability transitions. Cher says: "*Directly, I do not think [that Innofest contributes to sustainability transitions]. Indirectly, yes [Innofest does]. When we make sure that entrepreneurs can test and improve their product and make an uplift in society by doing so.*" Benthe says: "*By supporting these social businesses and helping them to better market themselves, and thus ensuring that they are indeed successful, we naturally hope to contribute to that [sustainability] transition.*"

Additionally, Innofest's method not only enables innovators to test and develop their prototype, but it also familiarizes the cultural sector and festival goers with sustainable alternatives. By testing at festivals, Innofest shows festivals and other businesses in the cultural sector that they can do things more sustainable. Simultaneously, visitors are getting acquainted with these innovations. According to Benthe, impact from testing reaches further than the innovation that is being tested. She says: "*On one hand, helping an entrepreneur, ensuring they can successfully enter the market and thus support that transition. Additionally, it is familiarizing the festival with innovations, and I think as a third point, also the visitor* *walking around at the festival, who comes into contact with such a business. And, in a lighthearted and fun way, can experience new things and see that it might be less scary than they thought, or it works perfectly a certain way, which then also allows people to implement it more and more easily."* An example of a test that reaches further than the innovation, is Semilla Sanitation. They tested to what extend shower water could be retained and reused to flush toilets at the Zwarte Cross. He explains: "*That fit really well with the festival, because the Zwarte Cross has to reduce the amount of wastewater they discharge to get a permit. With the system of Semilla Sanitation they can use water reserves, and less wastewater will be dumped."*

Innofest's method supports innovators in contributing to sustainability transitions. What can be recognized when looking at Innofest alumni, is that emerging systems merge with existing systems, allowing sustainable innovations and less-sustainable alternatives to co-exist. David states: "*I do not think [sustainable innovations make existing options] totally disappear, but they do offer a clear alternative."* Examples of Innofest alumni that merged with incumbent systems are Kumasi and Volta Energy. Kumasi is a fruit drink made from the juice of the cacao fruit, to provide cacao farmers with extra income. Benthe says: "*They use the parts of the cacao fruit that would otherwise be thrown away to make a soda. But that soda is also healthy, so there is no sugar added, which makes it better [than other sodas], and also very tasty, I think. They can already be found in many Dutch supermarkets. . . . They did not replace a product, but they can be found in the supermarkets next to other sodas, that might be produced in a less [transparent] way, that are not made of residual products and that are less healthy."* Second, Volta Energy provides a sustainable alternative to the diesel generator to provide an emission-free energy source. This example clearly shows that while sustainable innovations have the potential to replace incumbent systems, they might be in a disadvantage on some aspects. Benthe explains: *"They have hydrogen generators but also combined with solar panels. The focus lays on the solar panels, but when it is necessary, it switches to a hydrogen generator. . . . I often see them next to the highway, when a temporary traffic light needs to be installed, they connect [the generator] to it. But they are often also present at festivals."* David adds: *"For example. the diesel generator at festivals. There now is a sustainable alternative, these are the hydrogen generators. They now exist. It is a little bit too expensive to completely switch over. So, the festivals that find this really important, switch. But they also pay a bit more. And the ones that are more low budget, remain using the diesel [generators]."*

A large share of innovators individually contribute to sustainability transitions. All these innovations together, however, can set a transition in motion. Kjel states: *"I think that sustainability transitions are not managed by one start-up. It is the sum of all initiatives across the world. And one startup that tests with us becomes much more successful than the other. . . . It is not that one start-up does it on their own, but the most successful start-up that tests with us, obviously makes more impact in the future. These are small improvements, but all these things added up together can make nice contributions."* Benthe adds: *"Eventually, that is what we strive for. That no matter how small or big, [the innovation] contributes something to society that makes it better."*

To summarize, Innofest contributes to sustainability transitions by supporting impactful innovators. Testing with Innofest reduces an innovation's probability of failure due to a lack of product-market fit and unvalidated assumptions. Early validation of assumptions regarding problem existence, product efficacy, and market demand prevents wasted resources that would otherwise be invested in unviable solutions, causing more innovations to be successful, eventually causing them to make more impact. Additionally, Innofest accelerates social innovations that are inherently focused on creating a better world through their method. By focusing its resources on ventures with the potential to advance sustainable and/or social transitions, Innofest ensures that support is directed where it can have the most meaningful impact.

7. Conclusion

This research aimed to understand how innovation intermediaries, such as the case study organization Innofest, enable social innovations that support sustainability transitions. The analysis of the case study reveals that innovation intermediaries play a multifaceted role in fostering the development and scaling of social innovations, primarily adopting the role of a connector. Innofest, through its strategic engagement with a diverse innovation network, exemplifies this role by actively seeking, funding, and linking novel social innovations with the necessary resources and test environments. The findings show that Innofest's role as a connector is crucial for its method, especially in securing funding, enabling innovators to test their prototype and validate their assumptions. As a non-profit organization, Innofest is heavily reliant on external financial support from diverse actors, including municipalities and knowledge institutions. By aligning with the goals of these funding partners and setting up a project, Innofest initiates collaboration that provides crucial funding, expertise and Living Labs. This mechanism ensures that social innovations, who often lack capital to execute tests on their own, can progress through the early stages of development, enlarging their probability of success.

Innofest takes on the role of a supporter by providing essential experimental environments and resources throughout the innovation cycle, from TRL 4 (prototype validation) to TRL 9 (market introduction). Innofest offers guidance in test design and employs various test methods that enable innovators to collect data. This continuous support is crucial for innovators to validate assumptions, refine their products, and achieve a better product-market fit. By validating these aspects as early on in the innovation cycle as possible, the probability of innovation failure reduces. The observed progression of innovators from earlier stages to market readiness highlights the effectiveness of Innofest's support.

Additionally, Innofest acts as a frontrunner by fostering early-stage innovations, such as innovators in the MDT projects, and by developing new approaches to their method, like an online support model in response to external pressures. Their proactive stance on innovation and adaptation to a changing environment is a key characteristic of a frontrunner.

While the role of a toppler is less explicitly recognized, Innofest contributes to systemic change by enabling and promoting sustainable alternatives. These alternatives, over time, can challenge and potentially merge with existing, less sustainable systems.

In essence, Innofest contributes to sustainability transitions by strategically supporting impactful innovators, consequently increasing their success rate and chance to make impact. Innofest acts as an accelerator, ensuring that resources are directed towards solutions that have the potential to advance sustainability transitions. Furthermore, Innofest helps to shift market demands and societal norms by familiarizing festival goers and the cultural sector with sustainable alternatives through their real-life testing method at festivals.

To conclude, innovation intermediaries enable social innovations that support sustainability transitions by implementing an extensive selection process, ensuring that their resources are directed to impactful innovators. They provide a testing environment in which innovators test their prototype and validate assumptions, closing the gap between research and development and the market introduction of a product or service. They allow innovators to gather valuable data to further develop the innovation and in that way, increase the probability of success.

8. Discussion

8.1 Reflection on research

This research, focusing on the role of innovation intermediaries in enabling social innovations for sustainability transitions, inherently adopts an anthropocentric point of view on sustainability. This deliberate framing is crucial for understanding the scope and limitations of the study. Sustainability, as a concept, encompasses a broad spectrum of perspectives, ranging from purely eco-centric views, prioritizing the inherent value of nature, to highly anthropocentric ones, which emphasize human well-being and the utility of nature for human benefit. In the context of this research, the focus on anthropocentric solutions aligns directly with the operational model of Innofest, the case study organization. Innofest's aim is to foster innovations that address societal and environmental challenges.

This anthropocentric lens is one of many valid approaches to addressing sustainability transitions. While it might not fully encompass the broader ecological concerns or the intrinsic rights of nature, it is a pragmatic and often effective pathway for driving change within existing socio-economic structures. Innofest, by focusing on solutions that directly impact human systems (e.g., sustainable consumption, waste reduction, energy efficiency), operates within a framework that resonates with human-centric policy and market drivers. Therefore, this research’s deliberate adoption of an anthropocentric perspective is not a limitation but a necessary alignment with the practical reality and focus of the innovation intermediary being studied. It allows for an in-depth exploration of how human-driven innovation and organizational support mechanisms can contribute to sustainability outcomes from a perspective that prioritizes societal needs and human well-being. A nature-centered or eco-centric point of view would necessitate a different research design and focus, potentially examining non-human agency in transitions or the rights of ecosystems, which falls outside the scope of this research

Furthermore, the research is inescapably value-driven, a characteristic that requires explicit acknowledgement and reflexivity. The researcher's personal interest in sustainability and personal values regarding environmental issues guide the entire research process, from the initial formulation of the research questions to the interpretation of findings. However, this can be considered a strength within interpretative research approaches, provided the researcher maintains a critical awareness of this influence.

The value-driven nature of the research indicates an intention to contribute to a cause considered significant by the researcher. This form of subjective engagement, while potentially introducing biases if unacknowledged, can also enrich the research with depth and nuanced understanding. By explicitly articulating this axiological position, the research seeks to maintain transparency and uphold the principles of reflexivity. An awareness of how personal values influence the formulation of research questions, the selection of data, and the interpretation of findings enables ongoing self-assessment throughout the research process. This critical reflection on the influence of the researcher's perspective is consistent with the core tenets of qualitative research, where the positionality of the researcher is recognized as an integral component of the inquiry.

8.2 Limitations

While this research provides valuable insights into the role of innovation intermediaries in sustainability transitions, several limitations should be acknowledged.

The research relies on a single case study (Innofest). While this allows for an in-depth understanding of one specific context, it limits the generalizability of the findings to other innovation intermediaries or different socio-economic contexts. The unique nature of Innofest as a non-profit organization focusing on social innovations in the Dutch context might mean that its roles and mechanisms are not directly transferable to another context. However, other organizations in similar roles can derive learnings from the findings of this research. By examining the different roles an innovation intermediary can adopt and how Innofest executes these roles, other organizations gain insights in what the best practices might be in enabling social innovations. Furthermore, highlighting how innovation intermediaries contribute to sustainability transitions exposes which actors are important in enabling transitions, and where there is still room for improvement.

Furthermore, a significant portion of the data is qualitative, derived from semi-structured interviews, observations and surveys. While valuable for capturing perceptions and experiences, it is susceptible to recall bias, particularly with Survey 2, which can be conducted up to two years after a test with Innofest. Innovators' memories of their experiences and impacts might differ from real-time observations, potentially influencing the accuracy of reported outcomes. While these limitations have to be considered, qualitative methods allow the researcher to collect targeted and deepening data on how an organization like Innofest operates. Therefore, the qualitative data collected enriches the quantitative data and proves a detailed description of the case.

While innovators reported contributing to sustainability transitions (60% in the two-year survey), the exact impact (e.g., precise reductions in CO_2 emissions, liters of water saved) was often difficult to quantify or was not clearly measured in the provided data. This makes it challenging to draw definitive conclusions about the tangible, scaled-up environmental or social benefits resulting from Innofest's interventions. Furthermore, it is difficult to connect an innovators progression directly to the Innofest method. It is not possible to estimate how an innovation would have developed without Innofest’s interference. It is, however, possible to state how Innofest enables social innovations, providing data on the successful support mechanisms of this innovation intermediary. Lessons can be drawn from these crucial insights to support future innovations.

Lastly, while a two-year follow-up survey provides some longitudinal perspective, sustainability transitions often unfold over much longer periods. The long-term impact and sustained success of innovations supported by Innofest remain subject to future observation. The current data might only capture initial acceleration, not sustained system transformation. Nevertheless, this research provides an understanding of this initial acceleration, which is crucial in sustainability transitions. In this way, innovation intermediaries discover how they can foster this acceleration, ensuring they eventually make an impact.

8.3 Recommendations

Building on the findings and limitations of this study, the following recommendations for further research are proposed.

First, conducting comparative studies involving multiple innovation intermediaries operating in different contexts. The current research is a single case study of Innofest, a non-profit organization in the Netherlands. While this provides an in-depth understanding of one specific context, it limits the generalizability of the findings. By comparing multiple intermediaries in different countries, sectors, or with different business models (e.g., non-profit vs. for-profit), future research could identify commonalities and divergences in their roles, strategies, and effectiveness. This would help other organizations in similar roles gain insights into best practices for enabling social innovations. It would also be useful for society by providing more robust, transferable insights into which support models are most effective in fostering sustainability transitions on a large scale.

Second, long-term research on the impact of innovations on transitions. This study provides some longitudinal data with a two-year follow-up survey, but sustainability transitions often unfold over much longer periods. The current data primarily captures initial acceleration rather than sustained system transformation. Therefore, long-term research that tracks social innovations and their intermediaries over a longer period of time would provide a clearer picture of how initial support translates into sustained societal impact and contributes to broader regime shifts. It would help actors, such as policymakers and investors, understand the true, lasting value of supporting these types of innovations.

Furthermore, future research could explore innovations that fail. The current research focuses primarily on innovations that have developed through Innofest's method. Data on innovations that were not selected, or those that failed even after receiving support, is not considered. Researching the reasons for these failures, even with intermediary support, could offer crucial insights into barriers to social innovation. This understanding would be valuable for informing more effective support strategies and selection criteria, ultimately increasing the overall success rate of social innovations and making the support system more efficient.

Lastly, in-depth research on support for innovations in a late stage of development, primarily in TRL 7 could be conducted. Innofest's primary focus is on innovations in TRLs 4, 5, and 6, where a prototype is ready for validation. While Innofest is working on expanding its activities to include longer-term testing in operational environments (TRL 7), this is still an area of development for the organization. Further research on the specific support mechanisms and challenges for innovation intermediaries when engaging with late-stage innovations, particularly concerning long-cyclical testing in operational environments, is needed. This would provide practical insights for organizations like Innofest and other actors in the innovation network, helping them to better support innovations in their final stages before full market adoption.

9. References

Afeltra, G., Alerasoul, S.A. & Strozzi, F. (2021). The evolution of sustainable innovation: from the past to the future. *European Journal of Innovation*, 26(2), 386-421. DOI 10.1108/EJIM-02-2021-0113

Ahrweiler, P. & Keane, M.T. (2013). Innovation networks. *Mind & Society*, 12, pp. 73-90. DOI 10.1007/s11299-013-0123-7

Ansell, C., Sorensen, E. & Torfing, J. (2022). Co-Creation for Sustainability: The UN SDGs and the Power of Local Partnership (1st ed.). Emeral Publishing Limited.

Arnold, G., Ludwick, S., Fatemi Mohsen, S., Krause, R. & Nguyen Long, L.A. (2024). Policy entrepreneurship for transformative governance. European Policy Analysis, 2024, 1-26. https://doi.org/10.1002/epa2.1222

Apajalahti, E.L. & Kungl, G. (2022). Path dependence and path break-out in the electricity sector. *Environmental Innovation and Societal Transitions*, 43, pp. 220-236. https://doi.org/10.1016/j.eist.2022.03.010

Asmar, L., Grigoryan, K., Dumitrescu, R. & Kühn, A. (2022). Survey on methods for early prototyping and validation of technical product ideas. IEEE 20th International Conference on Industrial Informatics. Perth, Australia, 2022, pp. 300-305, doi: 10.1109/INDIN51773.2022.9976130.

Bergvall-Kåreborn, B., Eriksson, C.I., Ståhlbröst, A. & Lund, J. (2009). A milieu for Innovation-Defining Living Labs. https://www.researchgate.net/publication/228676111_A_Milieu_for_Innovation-Defining_Living_Labs#:~:text=Our%20proposed%20definition%20of%20a,aiming%20to%20create%20sustainable%20values.

Bilali, H. E. (2019). The Multi-Level Perspective in Research on Sustainability Transitions in Agriculture and Food Systems: A Systematic Review. Agriculture, 9(4), 74. https://doi.org/10.3390/agriculture9040074

Bisman, J. (2010). Postpositivism and Accounting Research: A (Personal) Primer on Critical Realism. *Australasian Accounting Business & Finance Journal,* 4(4), 3-26.

Boland, T. (2024). Transformativity: The malleable foundations of social theory. History of the Human Sciences, 37(3-4), 223-241. https://doi.org/10.1177/09526951231224649

Brodnik, C. & Brown, R. (2017). The Co-Evolution of Institutional Logics and Boundary Spanning in Sustainability Transitions: the Case of Urban Stormwater Management in

Melbourne, Australia. *Environment and Natural Resources Research,* 7(3), pp. 36-50. https://doi.org/10.5539/enrr.v7n3p36

Burgos, D. (2019). The Innovation Cycle for Sustainable ICT Education. *IFIP advances in information and communication technology,* pp. 218–224. https://doi.org/10.1007/978-3-030-28764-1_24

Carter, N., Bryant-Lukosius, D., Dicenso, A., Blythe, J. & Neville, A.J. (2014). The use of triangulation in qualitative research. *Oncul Nurs Forum*, 41(5), 545-547, doi: 10.1188/14.ONF.545-547.

Chukwuma-Nwuba, E.O. (2013). The Failure of Most Entrepreuneurial Technological Innovation to Diffuse: What the Literature Says. *International Journal of Management Sciences*, 1(11), 463-470.

Cillo, V., Petruzzelli, A.M. & Ardito, L. (2019). Understanding sustainable innovation: A systemic literature review. *Corporate Social Responsibility and Environmental Management*, 26(1). DOI:10.1002/csr.1783

Cohen, L., Manion, L. & Morrison, K. (2017). Validity and Reliability. In: Research Methods in Education. Routledge Taylor & Francis Group.

Conroy, K.M., Jacobs, S. & Liu, Y. (2023). The dual knowledge role of open innovation intermediaries: Internal weaving and external filtering for MNE subsidiaries. *Technovation*, 123, pp.

De Haan, F.J. & Rotmans, J. (2017). A proposed theoretical framework for actors in transformative change. *Technological Forecasting & Social Change,* https://doi.org/10.1016/j.techfore.2017.12.017.

Díaz, S., Demissew, S., Carabias, J., Joly, C., Lonsdale, M., Ash, N., Larigauderie, A., Adhikari, J.R., Arico. S., Báldi, A., Bartuska, A., Baste, I.A., Bilgin, A., Brondizio, E., Chan, K.M., Figueroa, V.E., Duraiappah, A., Fischer, M., Hill, R., Koetz, T. & Zlatanova, D. (2015) The IPBES Conceptual Framework – connecting nature and people. *Current Opinion in Environmental Sustainability*, 14, 1-16. https://doi.org/10.1016/j.cosust.2014.11.002

Dolińska, M. (2012). Activity of Companies in Innovation Networks. *Equilibrium*, 7(1), 21-31, https://doi.org/10.12775/EQUIL.2012.002.

Edwards-Schacter, M.E., Matti, C.E. & Alcántara, E. (2012). Fostering Quality of Life through Social Innovation: A Living Lab Methodology Study Case. *Review of Policy Research*, 29(6), 672-692. DOI: 10.1111/j.1541-1338.2012.00588.x

Elmquist, M., Fredberg, T. & Ollila (2009). Exploring the field of open innovation. *European Journal of Innovation Management,* 12(3), 326-345. https://doi.org/10.1108/14601060910974219

Enthoven, G. (2023). How Do Ideas Change the World? Patterns in Social Innovation, *AIJR Proceedings*, pp. 130-139. https://doi.org/10.21467/proceedings.154.15

European Commission (n.d.). Green transition. Reform Support. Accessed on 27-01-2025. https://reform-support.ec.europa.eu/what-we-do/green-transition_en

EURAXESS (n.d.). TRL. *European Commission,* https://euraxess.ec.europa.eu/career-development/researchers/manual-scientific-entrepreneurship/major-steps/trl. Accessed on 8-5-2025.

Farla, J., Markard, J., Raven, R. & Coenen, L. (2012). Sustainability transitions in the making: A closer look at actors, strategies and resources. *Technological Forecasting and Social Change*, 79(6), pp. 991-998. https://doi.org/10.1016/j.techfore.2012.02.001

Fischer, L. & Newig, J. (2016). Importance of Actors and Agency in Sustainability Transitions: A Systematic Exploration of the Literature. *Sustainability*, 8(5), pp.1-21. https://doi.org/10.3390/su8050476

Garud, R. & Gehman, J. (2012). Metatheoretical perspectives on sustainability journeys: evolutionary, relational and durational. *Research Policy*, 41(6), 980–995. https://doi.org/10.1016/j.respol.2011.07.009

Geels, F. (2002). Technological Transitions as Evolutionary Reconfiguration Processes: A Multi-Level Perspective and a Case-Study. *Research Policy,* 31(8–9), 1257–1274. doi: 10.1016/S0048-7333(02)00062-8

Geels, F. (2004). From sectoral systems of innovation to socio-technical systems: Insights about dynamics and change from sociology and institutional theory. *Research Policy*, 33 (6-7), 897-920. https://doi.org/10.1016/j.respol.2004.01.015

Geels, F. & Rob R. (2006). Non-Linearity and Expectations in Niche-Development Trajectories: Ups and Downs in Dutch Biogas Development. *Technology Analysis and Strategic Management,* 18(3–4), 375–392. doi: 10.1080/09537320600777143

Geels, F. (2011). The multi-level perspective on sustainability transitions: Responses to seven criticisms. *Environmental Innovation and Societal Transitions*, 1(1), 24-40. https://doi.org/10.1016/j.eist.2011.02.002

Green, R. (2015). Innovation. In J.D. Wright (Ed.), *International Encyclopedia of the Social & Behavioral Sciences* (pp. 145-151). Amsterdam, Netherlands: Elsevier.

Greve, K., Vita, R. De, Leminen, S. & Westerlund, M. (2021). Living Labs: From Niche to Mainstream Innovation Management. *Sustainability*, 12(2), 791, https://doi.org/10.3390/su13020791

Guba, E. & Lincoln, Y.S. (1994). Competing paradigms in qualitative research. *Handbook of qualitative research*, 2, 105-117. https://miguelangelmartinez.net/IMG/pdf/1994_Guba_Lincoln_Paradigms_Quali_Research_chapter.pdf

Hadfield, G.K. (2009). Legal Barriers to Innovation. *University of Southern California Law School*, 26, 1-10.

Harel, R., Schwartz, D. & Kaufmann, D. (2020). Funding Access and Innovation in Small Businesses. *Journal of Risk and Financial Management,* 13(9), 1-16. https://doi.org/10.3390/jrfm13090209

Heidenrich, S. & Spieth, P. (2013). Why innovations fail – the case of passive and active innovation resistance. *International Journal of Innovation Management*, 17(5), 1-42. DOI: 10.1142/S13639196135002171350021-1

Holley, K. (2024). Transformative change. *Innovative Higher Education*, 34, 331-344. https://doi.org/10.4337/9781035317967.ch123

Innofest (n.d.). *Hoe en waarom het werkt*. Innofest. Accessed on 26-02-2025, via https://innofest.co/hoe-waarom-het-werkt/

Innofest (n.d.). *Workshops & inspiratiesessies.* Innofest. Accessed on 26-06-2025, via https://innofest.co/workshops-inspiratiesessies/

Innofest (n.d.). *Hoe ziet een test bij Innofest eruit?* Innofest. Accessed on 26-06-2026, via https://innofest.co/hoe-ziet-een-test-bij-innofest-eruit/.

Innofest (n.d.). *Test Like the Best: De Innofest Methodiek* [Whitepaper]. Accessed on 17-07-2025.

Innofest (n.d.). *Ontdek de Cases*. Innofest. Accessed on 27-07-2025, via https://innofest.co/ontdek-de-cases/.

IPCC (2023). *Climate Change 2023: Synthesis Report*. In: H. Lee & J. Romero (eds.). Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Geneva, Switzerland, pp. 35-115. doi: 10.59327/IPCC/AR6-9789291691647.

Kallis, G. (2011). In defense of degrowth. *Ecological Economics,* 70(5), 873-880. https://doi.org/10.1016/j.ecolecon.2010.12.007

Köhler, J., Geels, F., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., Alkemade, F., Avelino, F., Bergek, A., Boons, F., Fünfschilling, L., Hess, D., Holtz, G., Hyysalo, S., Jenkins, K., Kivimaa, P., Martiskainen, M., McMeekin, A., Mühlemeier, M.S., Nykvist, B. & Wells, P. (2019). An agenda for sustainability transitions research: State of the art and future directions. *Environmental Innovation and Societal Transitions*, 31, 1-32. https://doi.org/10.1016/j.eist.2019.01.004

Koistinen, K. (2019). Actors in sustainability transitions [Doctoral dissertation, LUT University].

Kopnina, H. (2015). The victims of unsustainability: a challenge to sustainable development goals. *International Journal of Sustainable Development & World Ecology*, 23(2), 113-121. https://doi.org/10.1080/13504509.2015.1111269

Leminen, S. (2015). Q&A. What Are Living Labs? *Technology Innovation Management Review*, 5(9): 29–35. DOI:10.22215/timreview/928

Markard, J., Raven, R. & Truffer, B. (2012). Sustainability transitions: An emerging field of research and its prospects. *Research Policy*, 41(6), 955-967. https://doi.org/10.1016/j.respol.2012.02.013

McKay, D.A., Staal, A., Abrams, J.F., Winkelmann, R., Sakschewski, B., Loriani, S., Fetzer, I., Cornell, S.E., Rockström, J. & Lenton, T.M. (2021). Updates assessment suggests>1.5°C global warming could trigger multiple climate tipping points. *ESS Open Archive*, DOI: 10.1002/essoar.10509769.1

Long, T.B., Blok, V., Dorrestijn, S. & Macnaghten, P. (2020). The design and testing of a tool for developing responsible innovation in start-up enterprises. *Journal of Responsible Innovation,* 7(1), pp. 45-75. https://doi.org/10.1080/23299460.2019.1608785

Marques, J.P.C. (2014). Closed versus Open Innovation: Evolution or Combination? *International Journal of Business and Management*, 9(3), 196-203. http://dx.doi.org/10.5539/ijbm.v9n3p196

Masuda, H., Kawakubo, S., Okitasari, M. & Morita, K. (2022). Exploring the role of local governments as intermediaries to facilitate partnerships for the Sustainable Development Goals. *Sustainable Cities and Society*, 82, pp. 1-12. https://doi.org/10.1016/j.scs.2022.103883

MDT (n.d.). *Wat is MDT*. Doe mee met MDT. Retrieved on 26-06-2025, on https://www.doemeemetmdt.nl/wat-is-mdt.

Ministry of the Environment (n.d.). What is the green transition? Government and ministries. Accessed on 27-01-2025. https://ym.fi/en/what-is-the-green-transition

Moldovan, S. & Goldenberg, J. (2004). Cellular automata modeling of resistance to innovations: Effects and solutions. *Technological Forecasting and Social Change*,71(3), 425–442. DOI:10.1016/S0040-1625(03)00026-X

Moon, K. & Blackman, D. (2014). A Guide to Understanding Social Science Research for Natural Scientists. *Comservation Biology*, 28(5), 1167-1177. https://doi.org/10.1111/cobi.12326

Morton, S., Pencheon, D. & Squires, N. (2017). Sustainable Development Goals (SDGs), and their implementation: A national global framework for health, development and equity needs a systems approach at every level. *British Medical Bulletin,* 124(1), 81-90. https://doi.org/10.1093/bmb/ldx031

Molinari, M., Vogel, J.A., Rolando, D. & Lundqvist, P. (2023). Using living labs to tackle innovation bottlenecks: the KTH Live-In Lab case study, 338, pp. 1-15. https://doi.org/10.1016/j.apenergy.2023.120877

Morisson, A. & Pattinson, M. (2020). Innovation Networks. Lille: Interreg Europe Policy Learning Platform.

Noviaristanti, S., Acur, N. & Mendibil, K. (2023). The different roles of innovation intermediraries to generate value. *Management Revies Quarterly*, 74, pp. 254-2577. https://doi.org/10.1007/s11301-023-00364-2

Nyström, A.G. & Leminen, S. (2011). Living Lab – A New Form of Business Network. *The 17th International Conference on Concurrent Enterprising, 2011*. Klaus-Dieter Thoben, Volker Stich & Ali Imtiaz (Eds.). https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6041224&tag=1

Paskaleva, K. & Cooper, I. (2021). Are living labs effective? Exploring the evidence. *Technovation,* 106, 1-10, https://doi.org/10.1016/j.technovation.2021.102311.

Pedraza-Farina, L. (2017). The Social Origins of Innovation Failures. *SMU Law Review*, 70(2), 377-446.

Pol, E. & Ville, S. (2009). Social innovation: Buzz word or enduring term? *The Journal of Socio-Economics,* 38(6), pp 878-885. 10.1016/j.socec.2009.02.011

Rattanasirivilai, S., Rotjanawasuthorn, S., Sirinapatpokin, S., Namdech, P., & Jermsittiparsert, K. (2025). Sustainable development. In Wongmahesak, K., Wekke, I.S. & Suanpang, P. (Eds.), *Business Sustainability Practices in Society 5.0* (pp. 1-36). Hershey, Pennsylvania: IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-9230-0.ch001

Raworth, K. (2012). A safe and just space for humanity – can we live within the doughnut?, London, OXFAM, 2012. https://www-cdn.oxfam.org/s3fs-public/file_attachments/dp-a-safe-and-just-space-for-humanity-130212-en_5.pdf

Reddy, P. B., Reddy, R. P., & Reddy, G. V. K. (2023). Social Innovation (SI) - Objectives, Challenges - Problems and Benefits, Methodology, Key Dimensions and Mechanism for Social Change in India. *International Journal For Multidisciplinary Research*, 5 (6). https://doi.org/10.36948/ijfmr.2023.v05i06.8519

Reid, J.R. & Baker, R.S. (2018). Designing and testing an educational innovation. *Pediatric Radiology*, 48, pp. 1406-1409. https://doi.org/10.1007/s00247-018-4193-x
Richardson, K., Steffen, W. Lucht, W., Bendtsen, J., Cornell, S.E., Donges, J.F., Drüke, M., Fetzer, I., Bala, G. Bloh, W. von, Feuler, G., Fiedler, S., Gertem, D., Gleeson, T., Hofmann, M., Huiskamp, W., Kummu, M., Mohan, C., Nogués-Bravo, D., Petri, S., Porkka, M., Rahmstorf, S., Schaphoff, S., Thonicke, K., Tobian, A., Virkki, V., Wang-Erandsonn, L., Weber, L. & Rockström, J. (2023). Earth beyond six of nine planetary boundaries. *Science Advances*, 9(37), 1-16, DOI: 10.1126/sciadv.adh2458

Ribas, F.T.T. & Macke, J. (2021). University-Society Integration Through Action Research Projects. In: W.L. Filho, U. Tortato & F. Frankenberger (Eds.), *Integrating Social Responsibility and Sustainable Development* (pp. 479-493). New York City: Springer Nature Publishing. DOI:10.1007/978-3-030-59975-1_32

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin III, F.S., Lambin, E., Lenton, T.M., Scheffer, M., Folke, C., Schnellhuber, H.J., Nykvist, B., Wit, C.A. de., Hughes, T., Leeuw, S. van der, Rodhe, H., Sörlin, S., Snyder, P.K., Costanza, R., Svedin, U., Falkenmark, M., Karlberg, L., Corell, R.W., Fabry, V.J., Hansen, J., Walker, B., Liverman, D., Richardson, K., Crutzen, P. & Foley, J. (2009). Planetary Boundaries: Exploring the Safe Operating Space for Humanity. *Ecology and Society,* 14(2), 1-33, [online] URL: https://www.ecologyandsociety.org/vol14/iss2/art32/.

RVO (2022). *Technology Readiness Levels (TRL).* Rijksdienst voor Ondernemend Nederland. Retreived on 25-07-2025, from https://www.rvo.nl/onderwerpen/trl#4-fasen%2C-9-technology-readiness-levels

Sachs, J.D., Schmidt-Traub, G., Mazzucato, M., Messner, D., Nakicenovic, N. & Rockström, J. (2019). Six Transformations to achieve the Sustainable Development Goals. *Nature Sustainability,* 2, 805-814. https://doi.org/10.1038/s41893-019-0352-9

Satalkina, L. & Steiner, G. (2022). Social Innovation: A Restrospective Perspective. *Minerva,* 60, 567-591. https://doi.org/10.1007/s11024-022-09471-y

Savacool, B.K., Turnheim, B., Martiskainen, M., Brown, D. & Kivimaa, P. (2020). Guides or gatekeepers? Incumbent-oriented transition intermediaries in a low-carbon era. *Energy Research & Social Science,* 66, pp. 1-17. https://doi.org/10.1016/j.erss.2020.101490

Scoones, I., Stirling, A., Abrol, D., Atela, J., Charli-Joseph, L., Eakin, H., Ely, A., Olsson, P., Pereira, L., Priya, R., van Zwanenberg, P. & Yang, L. (2020). Transformations to sustainability: combining structural, systemic and enabling approaches. *Current Opinion in Environmental Sustainability*, 42, 65-75. https://doi.org/10.1016/j.cosust.2019.12.004

Smith, A., Stirling, A. & Berkhout, F. (2005). The governance of sustainable socio-technical transitions. *Research Policy*, 34(10), 1491–1510. https://doi.org/10.1016/j.respol.2005.07.005

Sørensen, E. & Torfing, J. (2011). Enhancing Collaborative Innovation in the Public Sector. *Administration & Society*, 43(8), 842-868. https://doi.org/10.1177/0095399711418768

Ståhlbröst, A. (2012). A Set of Key-Principles to Assess the Impact of Living Labs. *International Journal of Product Development*, 17(1-2), 60-75. https://doi.org/10.1504/IJPD.2012.051154

Sundqvist, H. & Åkerman, M. (2024). Creating conditions for sustainability transformation through transformative governance - The case of plastic food packaging in Finland. *Journal of Cleaner Production*, 434, 1-12. https://doi.org/10.1016/j.jclepro.2023.140296

Swain, R.B. & Yang-Wallentin, F. (2020). Achieving sustainable development goals: predicaments and strategies. *International Journal of Sustainable Development & World Ecology*, 27(2), 96-106. https://doi.org/10.1080/13504509.2019.1692316

Tajeddin, M., Simba, A., Liguori, E.W., Edeh, J. & Nuhu, N. (2024). Exploiting a non-mainstream financial scheme to innovate: SMEs in the developing world. *International Journal of Entrepreneurial Behavior and Research,* 31(4), 872-893. DOI: 10.1108/IJEBR-07-2024-0745

Tyagi, S., Garg, N. & Paudel, R. (2014). Environmental Degradation: Causes and Consequences. *Russian Federation European Researcher*, 81 (8-2), 1491-1498. DOI: 10.13187/er.2014.81.1491

United Nations (n.d.). The 17 Goals. Department of Economic and Social Affairs, Sustainable Development. Retrieved on 27-01-2025, from https://sdgs.un.org/goals

United Nations (n.d.). Sustainability. Accessed on 17-07-2025. https://www.un.org/en/academic-impact/sustainability.

Van Der Minne, C., Hekkert, M., Nijhof, A., Loorbach, D., & Termeer, K. (2021). Houvast voor duurzame vernieuwers: Vier perspectieven op transitiedenken en doen. White Paper. Het Groene Brein.
https://www.sociaalcirculair.nl/wp-content/uploads/2021/02/Houvast-voor-duurzame-vernieuwers_Vier-perspectieven-op-transitiedenken-en-doen.pdf

Vilsmaier, U. & Ross, K. (2024). Transformations. *Elgar Encyclopedia of Interdisciplinarity and Transdisciplinarity,* 558-562.
https://www.elgaronline.com/display/book/9781035317967/ch122.xml

Visseren-Hamakers, I.J., Cashore, B., Loorback, D., Kok, M.T.J., de Koning, S., Vullers, P., van Veen, A. (2022). How to save a million species? Transformative governance through priorization. In: Visseren-Hamakers and Kok, M. (Eds.) 2022. *Transforming Biodiversity Governance.* Cambridge University Press.

Wang, T. (2023). Toward an understanding of innovation failure: The timing of failure experience. *Technovation*, 125, pp. 1-10. https://doi.org/10.1016/j.technovation.2023.102787

Whitworth, B. (2009). The Social Requirements of Technical Systems. In: B. Whitworth & A. de Moor (Eds.), *Handbook of Research on Socio-Technical Design and Social Networking Systems* (pp. 2-22). IGI Global Scientific Publishing. https://doi.org/10.4018/978-1-60566-264-0.ch001

Williams, M. & Moser, T. (2019). The Art of Coding and Thematic Exploration in Qualitative Research. *International Management Review*, 15(1), 45-55.
https://imrjournal.org/uploads/1/4/2/8/14286482/imr-v15n1art4.pdf

Yin, R.K. (2018). Designing case studies. In: R.K. Yin (ed), *Case Study Research and Applications* (pp 25-66). SAGE Publications, Inc.
https://us.sagepub.com/sites/default/files/upm-binaries/24736_Chapter2.pdf

Zapata-Aguilar, J.A. (2024). Social innovation. *Journal-Health Education and Welfare,* 8(14), 9-14. https://doi.org/10.35429/JHEW.2024.14.8.9.14

Zajko, M. (2018). Open innovation intermediaries – current roles and benefits. *Innovation Management, Entrepreneurship and Sustainability (IMES 2017), pp. 1129-1142.*

Zhang, T. (2022). Critical Realism: A Critical Evaluation. *Social Epistemology*, 37(1), 15-29. https://doi.org/10.1080/02691728.2022.2080127

10. Appendices

10.1 Appendix 1: Use of generative AI-systems

The entirety of the text presented in this research is my own original writing, reflecting my independent research process including brainstorming, argumentation, critical thinking and textual composition. An extensive literature search is employed to create a rich and detailed theoretical framework that lies the basis for this research. Building on the existing research, I have executed the desk research, participatory observations and interviews. Following this stage in the research process, I have personally developed the insights and connected the arguments presented in this Master's thesis.

Generative AI systems were, however, used in the preparatory stages of this research, specifically for quick access to background information and outlining tasks. This included exploring broad topics and structuring initial ideas. I am aware of the emerging social, environmental and ethical considerations associated with the use of AI systems and have tried to minimize any negative contributions to the environment by conducting my research.

10.2 Appendix 2: Consent form interview

Informatieblad voor deelname aan interview MSc Environment & Society Studies

Titel van het onderzoek:
De rol van innovatie facilitators in de ontwikkeling van sociale innovaties

Doel van het onderzoek:
Het doel van het onderzoek is om inzicht te krijgen in de rol van innovatie facilitators in de ontwikkeling van sociale innovaties, Innofest wordt hierbij onderzocht als case study. Sociale innovaties zijn innovaties die niet alleen gericht zijn op het maken van winst, maar ook een toegevoegde waarde hebben voor de maatschappij. Het onderzoek probeert de relatie tussen de actoren in het innovatie netwerk te begrijpen, en daarmee een beeld te vormen van de functie van Innofest.

Inhoud van het interview
Als u deelneemt aan het interview, vraag ik u om informatie te delen over uw werkzaamheden bij Innofest. Daarnaast vraag ik u hoe Innofest zich verhoudt tot eventuele partners of andere actoren, en hoe zij binnen het innovatie netwerk bijdragen aan duurzaamheidstransities. Het interview duurt ongeveer 30 minuten.

Audio-opname
Als u daarmee instemt, wordt het interview opgenomen om het gesprek na afloop te kunnen analyseren. De opname wordt uitsluitend voor dit onderzoek gebruikt. Na de afronding van het onderzoek wordt de opname verwijderd. Deelname aan het onderzoek is ook mogelijk zonder opname.

Vrijwillige deelname
De deelname aan dit onderzoek is vrijwillig. U kunt op elk moment uw deelname stopzetten, zonder dat dit gevolgen heeft. Ook hoeft u hier geen reden voor op te geven.

Privacy
De verzamelde gegevens worden vertrouwelijk behandeld. Deze gegevens – zoals uw naam, functie, organisatie en een eventuele audio-opname - worden uitsluitend voor dit onderzoek gebruikt en worden nooit zonder uw toestemming gedeeld met derden.

Opslag van de gegevens
Uw gegevens worden bewaard in een beveiligde omgeving. Enkel de onderzoeker heeft toegang tot uw gegevens.

Uw rechten
U heeft het recht om uw gegevens in te zien, te corrigeren of te verwijderen. U kunt uw deelname aan het onderzoek op elk moment stopzetten, en u heeft het recht om uw toestemming in te trekken.

Contactinformatie
Voor vragen over het onderzoek of over hoe uw gegevens worden verzameld en verwerkt, kunt u contact opnemen met:

Iris Heerschop
Masterstudent Environment & Society Studies, Radboud Universiteit Nijmegen
iris.heerschop@ru.nl
06-14948789

Toestemmingsformulier voor deelname aan interview MSc Environment & Society Studies

Titel van het onderzoek
De rol van innovatie facilitators in de ontwikkeling van sociale innovaties

Onderzoeker
Iris Heerschop
Master student Environment & Society Studies aan de Radboud Universiteit Nijmegen, track Local Environmental Change & Sustainable Cities
iris.heerschop@ru.nl
06-14948789

Toestemming voor deelname aan het interview
Door dit formulier te ondertekenen, geef ik toestemming voor mijn deelname aan het interview zoals beschreven in het Informatieblad.

Ik begrijp dat:
- Mijn deelname volledig vrijwillig is en dat ik op elk moment kan stoppen met mijn deelname zonder dat dit gevolgen heeft.
- De data die tijdens dit interview verzameld wordt, wordt gebruikt voor onderzoeksdoeleinden zoals beschreven in het Informatieblad.
- Mijn persoonlijke gegevens vertrouwelijk behandeld worden en alleen voor dit onderzoek ingezet worden.
- Als er een audio-opname gemaakt wordt, deze opname alleen voor dit onderzoek wordt gebruikt en op een later moment wordt verwijderd.
- Ik het recht heb om mijn gegevens in te zien, te corrigeren of te verwijderen.
- Ik het recht heb om mijn toestemming in te trekken zonder gevolgen.

Toestemming voor de verzameling en verwerking van gegevens
- Ik geef toestemming voor het verzamelen en verwerken van mijn gegevens voor het doel van dit onderzoek.
- Ik geef toestemming voor het opnemen van mijn interview (audio).

Vermelding in de scriptie
- Ik wil volledig anoniem blijven – mijn naam, organisatie en functie worden niet genoemd.
- Alleen mijn organisatie mag worden genoemd, maar niet mijn naam en functie.
- Alleen mijn naam en functie mogen worden genoemd, maar niet mijn organisatie.
- Zowel mijn naam en functie als mijn organisatie mogen worden genoemd.

Handtekening en Datum

Naam: ____

Datum: ____

Handtekening: ____

10.3 Appendix 3: Interview Guide

Categorie	Vraag	Evt. doorvragen	Vragen aan
Introductie	Wat is jouw functie bij Innofest?		Iedereen
Uitleg over cases en werkwijze Innofest	Hoe selecteert Innofest met welke cases zij gaan testen?		Test expert
	In welke fase van een innovatie testen zij met Innofest?		Test expert, New Business
	Hoe wordt het doel van een test bepaald?		Test expert
	Wat zijn uitdagingen waar deze cases vaak tegenaan lopen?	Wat doet Innofest om deze uitdagingen op te lossen? Zijn er andere actoren die hieraan bijdragen?	Test expert
	Welke factoren beïnvloeden volgens jou het succes van een case?	Hoe draagt Innofest daaraan bij?	Iedereen
Netwerk van Innofest	Met welke actoren werkt Innofest samen?	Hoe selecteert Innofest met welke partijen zij samenwerken? Wat zijn uitdagingen in deze samenwerking?	New Business
Sociale innovatie	Hoe draagt Innofest bij aan sociale innovatie?	Hoe draag je binnen jouw functie bij aan sociale innovatie?	Iedereen
Living Labs	Hoe wordt een Living Lab geselecteerd?	Zijn er bepaalde criteria waaraan een Living Lab moet voldoen?	Test Expert
	Welke actoren zijn betrokken bij een Living Lab?	Wat is hun rol?	Iedereen
	Hoe worden Living Labs ingezet door Innofest?	Wat is het doel van een Living Lab? Wat wordt er precies getest in Living Labs? Wat is hierin de rol van Innofest? Wat is de relatie tussen het Living Lab en Innofest?	Test Expert, Projectleider
Duurzaamheidstransities	Hoe zou je duurzaamheidstransities omschrijven?	Wat zie jij als de belangrijkste aanjagers en uitdagingen van deze transities?	Iedereen
	Wat is de invloed van Innofest in deze transities?	Welke waarden of overtuigingen spelen	Iedereen

		binnen Innofest een rol in deze transities?	
	Wat is de invloed van de innovators in deze transities?		Test expert
	Met welke andere actoren werkt Innofest samen?	Wat is hun invloed in transities naar duurzaamheid?	Test expert
	Zijn er – voor zover jij weet - innovaties die een bestaand product of dienst helemaal hebben overgenomen?	Hoe hebben zij dit bereikt? Was dit voor het testen met Innofest al hun doel? Zo niet: zijn er innovaties die naast een bestaand product of een bestaande dienst bestaan en die even succesvol zijn geworden? Hoe hebben zij dit bereikt?	Iedereen
	Hoe zorgt Innofest ervoor dat de innovaties bekend worden bij een groter publiek?		Communi-catie
Afsluiting	Wat is volgens jou de belangrijkste reden waarom testen met Innofest relevant is?		Iedereen

10.4 Appendix 4: Surveys

10.4.1 Survey 1: Living Lab evaluation

Living Lab Evaluatie

We leren graag welke invloed Innofest op je heeft gehad en hoe we jou verder kunnen helpen. Het invullen duurt 5 minuten en helpt ons enorm.

We'd like to learn which effect Innofest had on your organisation and how we can continue to help you. It takes around 5 minutes and it is a big help for us.

Voornaam *

What is your first name?

Achternaam *

Last name

Innovatie *

Innovation

E-mail adres *

E-mail address

Wat is je huidige jaaromzet? *

We willen onze opdrachtgevers graag laten zien met welke omvang van start-ups we samenwerken.

What is your annual income? We would like to demonstrate to clients the range of start-ups we engage with.

- Tussen €0-€50.000
- Tussen €50.000-€250.000
- Tussen €250.000-€500.000
- Meer dan €500.000
- Bedrijf is niet meer actief

Wat ga je komend jaar doen?

Welke fase past nu het beste bij jouw innovatie? *

Which phase currently suits your innovation?

- 1. Toetsen van concept
- 2. Ontwikkeling van ruw prototype / systeem
- 3. Toetsing van ruw prototype / systeem
- 4. Ontwikkeling van verfijnd prototype
- 5. Toetsing verfijnd prototype
- 6. Klaar voor de markt (commercialiseren van product/service)

- 7. Geïntroduceerd op de markt

Wat zijn je volgende stappen? *
What are your next steps?

Het testen met Innofest op een Living Lab is cruciaal voor de ontwikkeling van mijn bedrijf. *
Testing with Innofest at a living lab was crucial for the development of my company (the answers go from 'totally disagree' tot 'totally agree').

- Helemaal mee oneens
- Mee oneens
- Een beetje mee oneens
- Neutraal
- Een beetje mee eens
- Mee eens
- Helemaal mee eens

Welke resultaten heeft de test opgeleverd? *
Which results came out of the test?

Zijn de beoogde resultaten behaald? Welke wel en welke niet? *
Did you get the intended results? Which ones did you get and which ones did you miss?

Heeft de test of de samenwerking met Innofest en de Living Labs onverwachte inzichten of resultaten opgeleverd? Zo ja, welke? *
Did the test lead to any unsuspected insights? If so, which ones?

Wat zijn de concrete resultaten van de test? *
What are the concrete results of the test? (amount of testpersons, average results etc.)

Waar heb je behoefte aan na deze test en wat verwacht je van Innofest? *
What is your need after this test and what do you expect from Innofest?

Welke feedback- of evaluatiepunten heb je voor jezelf? *
Which feedback or evaluation points do you have for yourself?

Welke feedbackpunten heb je voor Innofest en/of het festival waar je hebt getest? *
What feedback do you have for Innofest?

Hoe heb je het testen met Innofest ervaren? *

Wat is je het meeste bijgebleven aan het traject met Innofest? *
What did you remember most about the program with Innofest?

Zou je Innofest aanraden aan andere ondernemers? *
Waarom wel of waarom niet?

Als je Innofest een beoordeling moet geven, welk cijfer zou dit zijn? (0-10, met 0 is negatief en 10 positief) *
If you would give Innofest a grade, what would this be? (0-10, 0 is negative and 10 positive)

Ik sta open om mee te gaan naar events van partners en relaties van Innofest om daar een presentatie te geven over mijn ervaringen met het testen met Innofest: * *
I'm willing to join Innofest in giving a presentation about my experiences of testing with Innofest.

- Ja
- Nee

Wil je op de hoogte blijven van Innofest, meld je dan aan voor de Innofest nieuwsbrief *
Would you like to receive our newsletter? You can also follow us on
https://twitter.com/@InnofestNL https://www.instagram.com/innofest
https://www.linkedin.com/company/innofest-nederland

- Ja, graag
- Nee, dank je wel
- Ik ben al lid

Ik heb me aangemeld voor de Innofest alumni LinkedIn-groep, om op de hoogte te blijven van unieke kansen
https://www.linkedin.com/groups/12225923/
Ik heb deze evaluatie naar beste inzicht ingevuld *
I have completed this evaluation to the best of my knowledge

10.4.2 Survey 2: Bi-yearly evaluation entrepreneurs

Dankjewel dat je de tijd wilt nemen om ons te helpen impact te meten. Het invullen duurt 4 minuten.

Voornaam *

What is your first name?

Innovatie *

Wat is de naam van de onderneming waarmee je hebt getest? What is the name of the organization you tested?

In welke fase was je innovatie voordat je met ons ging testen? *

In which phase was your innovation when you started testing with us?

- 1. Toetsen van concept
- 2. Ontwikkeling van ruw prototype / systeem
- 3. Toetsing van ruw prototype / systeem
- 4. Ontwikkeling van verfijnd prototype
- 5. Toetsing verfijnd prototype
- 6. Klaar voor de markt (commercialiseren van product/service)
- 7. Geïntroduceerd op de markt

Welke fase past nu het beste bij jouw innovatie? *

Which phase currently suits your innovation?

- 1. Toetsen van concept
- 2. Ontwikkeling van ruw prototype / systeem
- 3. Toetsing van ruw prototype / systeem
- 4. Ontwikkeling van verfijnd prototype
- 5. Toetsing verfijnd prototype
- 6. Klaar voor de markt (commercialiseren van product/service)
- 7. Geïntroduceerd op de markt

Wat is je huidige jaaromzet? *

We willen onze opdrachtgevers graag laten zien met welke omvang van start-ups we samenwerken. What is your annual income? We would like to demonstrate to clients the range of start-ups we engage with.

- Tussen €0-€50.000
- Tussen €50.000-€250.000
- Tussen €250.000-€500.000
- Meer dan €500.000
- Bedrijf is niet meer actief

Heb je na de test met Innofest een investering opgehaald? *

Did you raise an investment after the test with Innofest?

- Ja, van een bank
- Ja, van een fonds
- Ja, van een business angel
- Ja, van een klant
- Ja, van een andere partij
- Nee, helaas nog niet
- Nee, geen behoefte aan
- Nee, wel subsidie

Heb je na de test met Innofest je team uitgebreid? *
Did you expand your team after the test with Innofest?

- Ja, met 1-5 medewerkers
- Ja, met 6-10 medewerkers
- Ja, met 10 of meer medewerkers
- Ja, maar niet bij mijn onderneming, maar bij partners of leveranciers
- Nee

Heb je na de test met Innofest nieuwe klanten/opdrachtgevers gehad? Wil je jouw top 3 noemen? *
Have you gained new clients after testing with Innofest? Can you name your top 3?

Heeft jouw startup bijgedragen aan de groene of sociale transitie, zo ja beschrijf jouw impact *
Has your startup contributed to the green or social transition? If so, describe your impact. (i.e reduced # liters of water / kg CO_2)

Tot slot heb je bijzondere updates of wat wil je nog wat met ons delen? *

Wil je op de hoogte blijven van Innofest, meld je dan aan voor de Innofest nieuwsbrief *
Would you like to receive our newsletter? You can also follow us on
https://twitter.com/@InnofestNL https://www.instagram.com/innofest
https://www.linkedin.com/company/innofest-nederland

- Ja, graag
- Nee, dank je wel
- Ik ben al lid

Ik heb deze jaar evaluatie, naar beste inzicht ingevuld *
I have completed this year’s evaluation to the best of my knowledge.