

ENABLING SUSTAINABLE ENTREPRENEURSHIP

In the context of the Frisian entrepreneurial ecosystem

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ABSTRACT

The current paper aims to investigate what barriers sustainable entrepreneurs face when setting up their business, and how they can be overcome in the context of Fryslân, the Netherlands. Enabling these entrepreneurs to conquer such barriers marks a step towards a stronger, more sustainable entrepreneurial ecosystem, or *sustainable valley*. Similarly, it will help the province in reaching its circularity goals, while stimulating sustainable entrepreneurial activity. Each entrepreneurial ecosystem has its own, unique characteristics, and studying those of the province of Fryslân results in a better understanding of real-life situations and practices, thereby increasing existing empirical knowledge of entrepreneurial ecosystems and their respective barriers. Semi-structured interviews with both entrepreneurs and essential ecosystem actors indicate that the first steps towards a stronger, more successful ecosystem have been undertaken. Nonetheless, the province of Fryslân still has a long way to go in order to become a true sustainable valley.

Key words: sustainable entrepreneurship, ecosystem, sustainable valley, barriers

INTRODUCTION

In the Netherlands, the government is aiming for more sustainable development, following the Sustainable Development Goals (SDGs) identified by the United Nations (Rijksoverheid, 2021). Amongst others, this is manifested in municipal practices, as numerous municipalities now are moving towards a more circular economy (e.g. Circulair Fryslân, 2021a; Provincie Groningen, 2020; City of Amsterdam, 2021). This is also the case in the province of Fryslân, which is situated in the north of the Netherlands. Several actors are participating in engaging new and innovative opportunities to foster development and entrepreneurial activity in the province (Circular Fryslân, 2015). Especially sustainable entrepreneurial activity is fundamental in these programs and interventions (Circulair Friesland, 2021b), as this is concerned with decreasing its negative impact on both society and the environment (Cohen & Winn, 2007). More specifically, these actors are aiming to facilitate a circular environment for Fryslân, to create ‘*an economy for the future*’ (Circulair Fryslân, 2015: 5). Circularity, or the circular economy, is characterized by its aim to restore, rather than create damage when obtaining resources, while at the same time trying to create as little waste as possible (Ellen MacArthur Foundation, 2021; Murray, Skene, & Haynes, 2017). It attempts to integrate economic activity and environmental prosperity in a sustainable way. The reason such a circular economy is appealing for Fryslân is that it presumably promotes innovation, creates employment, but it also protects and repairs the current ecosystem and biodiversity (Circular Fryslân, 2015). The latter is particularly interesting, as Fryslân is known for its extraordinary landscape and nature (Congresbureau Friesland, 2021).

Moreover, another advantage of a circular economy is that it allows for fostering business activity as well (Murray et al., 2017). This is interesting, as it appears that entrepreneurial activity in Fryslân is lacking compared to other areas. In 2018, the only two provinces that

had less growth in start-ups were Limburg and Drenthe (Van der Beek, 2019). As such, attempting to make Fryslân more circular would also be beneficial for Fryslân in order to stimulate business activity. Circularity then serves as a facilitating mechanism for the province to achieve such a goal.

When aiming to foster entrepreneurship in a particular area, it is useful to look at its specific ecosystem rather than focusing on the characteristics of individual entrepreneurs. Moreover, this individual mindset is not sufficient when looking at the regional context (Xie, Wang, Xie & Duan, 2021). Xie et al. (2021) argue that it is crucial to consider the combination of environmental factors that are present within the ecosystem. An entrepreneurial ecosystem *'comprises a set of interdependent actors and factors that are governed in such a way, that they enable productive entrepreneurship'* (Stam & Van der Ven, 2019: 2). Sustainable entrepreneurial ecosystems, or how Cohen (2006) calls them; *'sustainable valleys'*, foster sustainable entrepreneurship. Sustainable valleys are communities where the entrepreneurial ecosystem is designed in such a way that it enables innovative, sustainable businesses to develop successfully. It results in a collection of sustainable developments in a specific geographic region. The outcome of such a well-designed ecosystem is plenty of entrepreneurial activity and sustainable development in the area. Thus, the formation of a supportive ecosystem could be a potential answer for the call for more entrepreneurial activity in the province of Fryslân (Isenberg, 2011).

In order to obtain a better understanding of how these valleys precisely function, Cohen (2006) elaborated on a list of core elements of the ecosystem, such as the presence of supportive government legislation, professional support services such as consultants, and a prosperous physical infrastructure, among others. Similarly, Isenberg (2011) introduces six

domains of entrepreneurial ecosystems that are determining the success of the ecosystem. All these domains or elements are identified as interrelated and interdependent. Both the core elements of the ecosystem of Cohen (2006), as well as the domains of entrepreneurial ecosystems of Isenberg (2011) are useful in identifying the success of a particular area in terms of business activity. They could, for example, be used to identify the certain barriers that sustainable entrepreneurs encounter when setting up their business. Scholars argue that sustainable entrepreneurs face more obstacles compared to conventional entrepreneurs (Hoogendoorn, Van der Zwan, & Thurik, 2019). The different players in the ecosystem perform a very important role in this (Cohen, 2006), as for example the lack of available capital for sustainable businesses can determine the success of a venture. Similarly, these entrepreneurs need to have access to employees with the right knowledge and skills.

As the province is aiming to foster sustainable entrepreneurial activity, it is essential to eliminate or diminish these barriers. Therefore, this study aims to research the barriers that sustainable entrepreneurs face in the province of Fryslân. More specifically, the research question is:

‘What barriers must be overcome in order to develop a sustainable valley in the province of Fryslân, the Netherlands?’

Using the ecosystem framework of Cohen (2006) and elaborating on the study of Hoogendoorn et al. (2019) answering this research question aims to obtain a better understanding of the opportunities and threats for entrepreneurs in the Frisian ecosystem, and shines light on how existing institutions could address these opportunities and threats. This would facilitate a better understanding of real-life situations and interactions within

ecosystems (Munoz & Cohen, 2018). Besides, Cohen (2006) argues that each ecosystem is unique and has its own characteristics. Studying the ecosystem of Fryslân therefore might not only give more theoretical insights on ecosystems in general, but could also give practitioners a better understanding of how they can contribute to flourishing sustainable entrepreneurial activity, thereby facilitating a ‘sustainable valley’ in Fryslân.

The next section will examine the theoretical background of the concepts introduced in the current section. After, the methods of how the research question is answered will be given. Then, the results will be elaborated, and finally this study will discuss the conclusions and implications.

THEORY

The following section elaborates on the different theories and subject that are adopted to answer the research question.

Sustainable Entrepreneurship

In order to continue elaborating on sustainable entrepreneurship, it is useful to first determine what exactly the subject entails. Sustainable entrepreneurship initially combines two concepts. The first one, sustainability, can be defined as *'meeting the needs of the present without compromising the ability of future generations to meet their own needs'* (UN Brundtland report, 1987: 16). Continuing, entrepreneurship is defined according to the widely used definition of Shane & Venkataraman (2000: 218) as *'the scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated and exploited'*. Combining these two aspects then results in sustainable entrepreneurship. Sustainable entrepreneurs aim to address not only financial goals, as most conventional entrepreneurial ventures, but combine this with social and/or environmental goals (Cohen & Winn, 2007), thereby addressing the collective goal(s) of society (Pacheco, Dean & Payne, 2010). Often, this includes the opportunities that arise from issues that have been ignored or have been unsuccessfully addressed by existing institutions (Hoogendoorn et al., 2019).

As sustainable entrepreneurs pursue a multiplicity of goals, this produces additional challenges for them, especially when setting up their business (Hoogendoorn et al., 2019). More specifically, these authors identified three primary challenges for sustainable entrepreneurs. First, the aim of sustainable entrepreneurs to pursue opportunities that are the result of market failures suggests additional setbacks. Investing in social and/or environmental

goals often leads to value spillovers, which are not always monetized. Second, sustainable entrepreneurs aim to facilitate institutional change. Changing industry norms, installing property rights, or facilitating government legislation (Pacheco et al., 2010) is not something that is easily facilitated. Lastly, Hoogendoorn et al. (2019) argue that sustainable entrepreneurs require considerable proficiency as they operate under an unfavorable institutional context, challenging market imperfections. These challenges are divided into three categories; financial, administrative and informational, which, in turn, form the barriers for sustainable entrepreneurs compared to conventional entrepreneurs (Hoogendoorn et al., 2019). For example, the priorities of financial investors regarding value creation and value capturing are often not aligned with the priorities of sustainable entrepreneurs. Here, the multiplicity of goals for sustainable entrepreneurship presents a significant role, as for financial investors, the economic goal is generally prevailing. Additionally, non-financial barriers relate to the fact that the administrative procedures and information are usually not convenient for sustainable entrepreneurs. This is particularly visible when sustainable entrepreneurs, that aim to address market failures, encounter unfavorable industry norms and legislation, for example (Hoogendoorn et al., 2019).

Meijer, Huijben, Van Boxtael, & Romme (2019) encountered similar barriers for innovation technologies by SMEs in the Dutch sustainable energy sector. Most of the barriers they identified can be classified in the financial, administrative and information categories of Hoogendoorn et al. (2019). One noteworthy impediment that has not explicitly been mentioned by Hoogendoorn et al. (2019) is the presence of a high market competition. Meijer et al. (2019) found that first, entrepreneurs have difficulty accessing the market because potential end users are adverse of using new technologies, second, entrepreneurs mainly focus

on product efficiency rather than the business plan, and third, they face high costs for innovation which affects their price competitiveness.

As these barriers pose a significant challenge for sustainable entrepreneurs, this does not mean they are inclined to failure. In contrast, Pacheco et al. (2010) demonstrate that sustainable entrepreneurs can present an alternative to the defects of conventional entrepreneurs by addressing the collective goal of society, rather than the individual goal of the business or the entrepreneur. However, by addressing these barriers, the several components of the entrepreneurial ecosystem seem indispensable (Cohen, 2006).

Sustainable Valleys

The barriers that sustainable entrepreneurs face when entering the market directly relate to the entrepreneurial ecosystem. The entrepreneurial ecosystem consists of actors and factors that are interdependent, and enable or constrain entrepreneurship within a particular area (Stam & Van de Ven, 2019). This implies that entrepreneurial success builds on the supportive capacity of the ecosystem (Cohen, 2006; Isenberg, 2011), as entrepreneurship takes place in a particular physical setting, or region (Malecki, 2017). However, this is a two-way relationship where the success of entrepreneurs simultaneously affects the prosperity of an area (Pacheco et al., 2010). For that reason, the ecosystem plays a crucial role within sustainable entrepreneurship literature (Cohen, 2006). Diminishing or even eliminating the barriers or constraints within an ecosystem permits the cultivation of a sustainable valley Cohen, (2006).

The elements identified in the classic entrepreneurial ecosystem by Stam & Van de Ven (2019) are categorized into three areas; the institutional arrangements, the resource endowments and the outputs. Institutional arrangements ‘*legitimate, regulate and incentivize*’ entrepreneurship (Van de Ven, 1993: 211), and consist of formal institutions, culture and

networks (Stam & Van de Ven, 2019). The resource endowment area examines the specific resources that are at the entrepreneur's disposal, such as the physical infrastructure, demand, intermediaries, talent, knowledge, leadership and finance. The institutional arrangements and resource endowments are present in a particular ecosystem, and they result in the output: productive entrepreneurship. Productive entrepreneurship is identified as '*aggregate welfare*' implying that there is a mutual interdependency between governments and entrepreneurs (Stam & Van de Ven, 2019: 812). Governments are usually concerned with creating welfare and entrepreneurs can serve as a major contribution to this welfare. On the other hand, entrepreneurs are highly dependent on the circumstances that are shaped by governments (Stam & Van de Ven, 2019). The authors demonstrate this with their theoretical model (figure 1). Indeed, concepts such as embeddedness and context have been highlighted by other researchers as important for entrepreneurship, and, in particular sustainable entrepreneurship (Pacheco et al., 2010). Embeddedness refers to the connection to a certain place and its community, and explains how context influences perceived entrepreneurial opportunities (McKeever, Jack & Anderson, 2015). In this sense, a favorable context, or the entrepreneurial ecosystem that an entrepreneur operates in, can become a resource in itself (Cohen, 2006; McKeever et al., 2015).

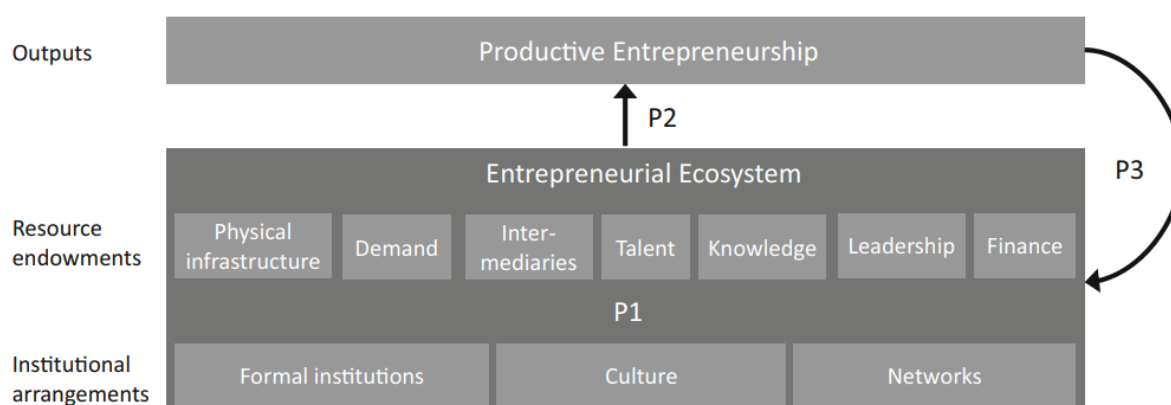


Figure 1 – Elements and outputs of the entrepreneurial ecosystem (Stam & Van de Ven, 2019: 813)

The theoretical framework proposed by Stam & Van de Ven (2019) is composed of elements similar to Cohen's (2006) framework for sustainable valleys. First of all, the entrepreneurial network, culture and formal institutions play a major role in Cohen's (2006) description of a sustainable entrepreneurial ecosystem. Indeed, it has been found that the informal network of a sustainable entrepreneur is particularly important, as the formal network might not be as supportive (Neumeyer & Santos, 2018). The reason the formal network lacks support, is because there appears to be a misunderstanding, or a lack of information about sustainability practices (Cohen, 2006). Support of- and understanding sustainability practices are characteristics that distinguish a conventional entrepreneurial ecosystem from a sustainable valley. This support and understanding might be reinforced or attenuated by the culture of an ecosystem. Therefore, culture might be the most important element of a sustainable valley, according to Cohen (2006). Continuing, where Stam & Van de Ven (2019) talk about institutions, implying governmental and regulatory systems, Cohen (2006) talks about the local, regional, or national government. In order to stimulate sustainable entrepreneurship, he argues, governments should be enabling entrepreneurship practices, as well as innovation practices. In fact, he argues that a lot of innovation could be facilitated if policies were applied properly, for example with obligatory reduced emissions vehicles.

The second aspect that Stam & Van de Ven (2019) discussed concerns the resource endowments. Similar to Cohen (2006), they mention the importance of a physical infrastructure, intermediaries, talent, knowledge, and finance for entrepreneurs. Cohen (2006) argues that research universities provide knowledge with regards to sustainability, and they serve as an example. Therefore, they serve as a major actor to raise awareness for sustainability and entrepreneurship. Intermediaries, or as Cohen (2006) calls them: support & professional services, are critical in providing assistance and guidance to sustainable

entrepreneurs. Similarly, sustainable entrepreneurs need start-up capital, or finance, to set up their venture. Investors have to understand the need for sustainability practices and be willing to financially support these entrepreneurs. Sustainable entrepreneurs also require access to competent staff to assist or elaborate on their business practices, which relates to the talent aspect. In addition, factors such as the cost of real estate, transport facilities, and other accommodations address the livability of an area. The physical infrastructure is therefore essential in the creation of a sustainable entrepreneurial ecosystem (Cohen, 2006; Stam & Van de Ven, 2019).

There are also some differences between the frameworks. For example, Stam & Van de Ven (2019) include the aspects '*demand*' and '*leadership*', where the former relates to the means of the community to actually buy the goods or services from the sustainable entrepreneur, the latter refers to the ability of the sustainable entrepreneur to provide guidance and direction for collective action towards a social and/or environmental goal. Conversely, Cohen (2006) argues that large corporations in the ecosystem can provide an important source for qualified personnel. They form a major contribution to the degree of innovation in the ecosystem, just as technology parks do. In combination with research universities, this effect can be even stronger.

In sum, there appear to be many similarities between the elements of conventional and sustainable ecosystems. The main contrast between the two seems to concern the factors of understanding and supporting sustainability (Cohen, 2006). This implies that in order for sustainable entrepreneurs to be productive, the ecosystem actors have to anticipate for additional support to lower the barriers that sustainable entrepreneurs perceive when setting up their business (Cohen, 2006; Hoogendoorn et al., 2019). When these actors reduce, or even eliminate financial, administrative or informational barriers as identified by Hoogendoorn et

al. (2019), this fosters sustainable entrepreneurship, and will result in the creation of a sustainable valley (Cohen, 2006).

METHODS

The current section outlines the research background, the data collection and the data analysis. Case study research can be conducted by both qualitative and quantitative research (Bryman, Bell & Harley, 2019). However, in order to obtain a full understanding of the barriers sustainable entrepreneurs perceive and how they can be overcome in the context of Fryslân, an abductive approach with a qualitative research design is most appropriate (Alvesson & Kärreman, 2007). It allows for validating existing theory, while acknowledging and supporting the unique characteristics in the Frisian entrepreneurial ecosystem. This is essential, as each ecosystem is unique and has its own peculiarities (Cohen, 2006).

Semi-structured interviews were conducted as this is pragmatic when interviewing several people. They allow for structured questions while simultaneously supporting the opportunity to examine a particular topic more in-depth (Bryman et al., 2019). This will facilitate a better understanding of real-life situations and interactions in ecosystem theory (Munoz & Cohen, 2018).

Data Collection

The semi-structured interviews were separated into two parts. First, sustainable entrepreneurs were interviewed to obtain an understanding of their perspective and experience towards the barriers in the Frisian entrepreneurial ecosystem. Second, these findings were used to interview important institutions in the entrepreneurial ecosystem to obtain a better understanding of their role in relation to these barriers. The participants were selected based on purposeful sampling, as this ensures participants' ability to provide knowledgeable answers with regards to the research questions (Bryman, 2008). The interviewees were either contacted through the network of the researcher, the network of Campus Fryslân, or through

the network of Founded in Friesland, an incubator focused on Frisian start-ups (Founded in Friesland, 2021a).

Entrepreneurs were selected based on a few criteria. First, they had to operate in the province of Fryslân. Second, in compliance with the definition of sustainable entrepreneurs of Cohen & Winn (2007) and Pacheco et al. (2010), entrepreneurs had to consciously address a duality of goals (e.g. financial, social, and/or environmental). Next, following the study of Burström, Harri & Wilson (2018) about nascent entrepreneurs, the entrepreneurs interviewed did not have experience in starting previous ventures, can be identified as the founders of the businesses, and were active for less than five years. This reduces ambiguity regarding interviewees' experiences with entrepreneurship, eliminating biases from previous encounters or the distortion of memories by time. In total, four different entrepreneurs were interviewed, operating in diverse industries or sectors such as cosmetics, education & food production, circular product manufacturing and the horticultural industry. This broad range of businesses allows for examining the Frisian ecosystem from differing perspectives.

The second part of the data collection consists of interviews with employees or members of important ecosystem actors, such as support system providers, educational or research institutes, the local government, a local union, a capital provider and finally a successful, existing business (Cohen, 2006; Stam & Van de Ven, 2019). Interviewing the latter is helpful in validating previous findings as a successful business is experienced when it comes to setting up a business in Fryslân, and therefore knows the 'trick'.

One person per institution or organization is interviewed relying on the criteria of representativeness, knowledgeability and experience when selecting each participant. Naturally, terms of availability and willingness played a role when selecting participants for the interviews (Bryman et al., 2019). An overview of all the interviewees of the sample is provided in table 1.

	Position /organization	Role in ecosystem	Date	Duration interview
Interviewee 1	Founder	Entrepreneur	20-04-2021	34:28
Interviewee 2	Founder	Entrepreneur	21-04-2021	33:02
Interviewee 3	Co-Founder	Entrepreneur	21-04-2021	27:41
Interviewee 4	Founder	Entrepreneur	23-04-2021	1:08:04
Interviewee 5	Founded in Friesland	Support service provider	06-05-2021	51:45
Interviewee 6	WaterCampus Leeuwarden	Research & Education	07-05-2021	39:56
Interviewee 7	University of Groningen	Research University	11-05-2021	29:03
Interviewee 8	Vereniging Circulair Fryslân	Support service provider	17-05-2021	29:20
Interviewee 9	Investment manager	Capital provider	19-05-2021	37:55
Interviewee 10	CEO	Large, existing business	20-05-2021	27:05

Table 1 – Overview of interviewees

Previous to the interviews, all interviewees signed an informed consent (Appendix A) in which they agreed with the terms and conditions of the research. This includes the approval of the interviews being recorded and transcribed for research purposes. In compliance with the present COVID regulations, most interviews were conducted online and lasted approximately 30 to 60 minutes. Two of the interviews were administered in person, at the location of the

company or organization, while taking into account the pertinent COVID-19 measurements. The questions for entrepreneurs differed from the questions of the institutions, as they serve a different purpose. Whereas both types of interviews were aimed at validating theory and increasing the understanding of entrepreneurial barriers in Fryslân, the main difference lies in the varying perspectives. For entrepreneurs, questions were first aimed at obtaining a general understanding of their company, and how they got in touch with entrepreneurship. The second part of the interview was focused on understanding how they set up their business. By first asking about the expectations and challenges and then about how they would want to do things differently if they could, this allows to indirectly examine the challenges and barriers that entrepreneurs faced. The last part of the interview aims to examine the role of Fryslân and other ecosystem actors for the entrepreneur. Especially the question ‘what do you think makes Fryslân interesting for entrepreneurs?’ is essential, as this indirectly aims for a general way to talk about Fryslân as an opportunity for entrepreneurs and entrepreneurship.

For ecosystem players, the interview questions were partly based on the outcomes of the interviews with the entrepreneurs. For example, the entrepreneurs highlighted the importance of support service providers and the convenience of a beneficial network. These themes were also discussed when interviewing the ecosystem actors. The basic themes that were examined were the Frisian entrepreneurial ecosystem, their personal experience within this ecosystem, and the shortfalls of the current ecosystem. Similarly, questions were asked regarding potential barriers for sustainable entrepreneurs, and how the ecosystem and its actors could overcome these barriers with, for example, support or assistance.

Depending on the characteristics of each particular ecosystem actor, additional questions were asked regarding the role of an ecosystem actor within the ecosystem. In order to obtain an exhaustive prospect of the Frisian ecosystem, it is essential to understand the role of each player. The complete question guidelines can be found in Appendices B and C.

Data Analysis

In order to analyze the data, the recorded interviews were transcribed and certain sections were color-coded using predefined codes. These codes consisted of key themes that were derived from the interview guideline and the theory. In total, four general color codes were identified for the entrepreneurs, which are demonstrated in Table 2. Similar codes were prescribed for the ecosystem actors (Table 3), while taking into account the differing role and perspective of the ecosystem actor. Color coding this way allowed structuring the information-rich data to make it more comprehensible (Bryman et al., 2019).

	Code	Meaning
1.	General company information	Information regarding the origin of the business idea, how the business was set up, how the business is currently doing, who is involved and other general information regarding the business.
2.	Motivation to become self-employed	The inspiration and motivation that has led the entrepreneur(s) to actively exploit their business idea.
3.	Existing elements or support	Any type of element, aspect or facility already present within the ecosystem that strengthens, improves or benefits the ability of entrepreneurs to be successful
4.	Missing or constraining elements	Any type of element, aspect or facility that is not (sufficiently) present within the ecosystem, or that is constraining or limiting the ability of entrepreneurs to be successful

Table 2 – Color codes entrepreneurs

	Code	Meaning
1.	General information about ecosystem actor	Basic information regarding the specific ecosystem actor, what they do, how they do it and who is involved.
2.	Position in ecosystem	The position of the respective actor with respect to the ecosystem.
3.	Existing elements or support	Any type of element, aspect or facility already present within the ecosystem that strengthens, improves or benefits the ability of entrepreneurs to be successful
4.	Missing or constraining elements	Any type of element, aspect or facility that is not (sufficiently) present within the ecosystem, or that is constraining or limiting the ability of entrepreneurs to be successful

Table 3 – Color codes ecosystem actors

As the current study aims to identify the potential barriers that entrepreneurs experience within the Frisian entrepreneurial ecosystem and how these can be minimized or removed to strengthen the ecosystem, it is useful to further elaborate on what is already there within the ecosystem, and what aspects need change (color codes 3 and 4). Therefore, a more in-depth analysis of codes 3 and 4 was done by assigning open codes to the text, which resulted in the coding tree demonstrated in figure 2. In total, five prevailing themes were identified with this open coding, with an additional one for entrepreneurs. This additional theme, ‘*personal*’, relates to personal issues, barriers or support that the sustainable entrepreneurs might have encountered. The definition of each theme is presented in table 4.

	Theme	Meaning
1.	Personal (only entrepreneurs)	Related to personal issues, and not to the ecosystem
2.	Financial	Related to the availability of financial support or assistance in any form within the ecosystem
3.	Informational	Related to the availability of information to entrepreneurs, customers, the ecosystem actors or other players that affect the ecosystem
4.	Administrative	Related to the existence of particular laws, regulations or administrative procedures that might affect the prosperity of the ecosystem in any way
5.	Cultural & Network	Related to the specific culture within the region or the ecosystem and the specific networks that might be present within this ecosystem
6.	Facilities	Related to any type of facilities that might be offered within the ecosystem that support or constrain entrepreneurial success

Table 4 – Themes

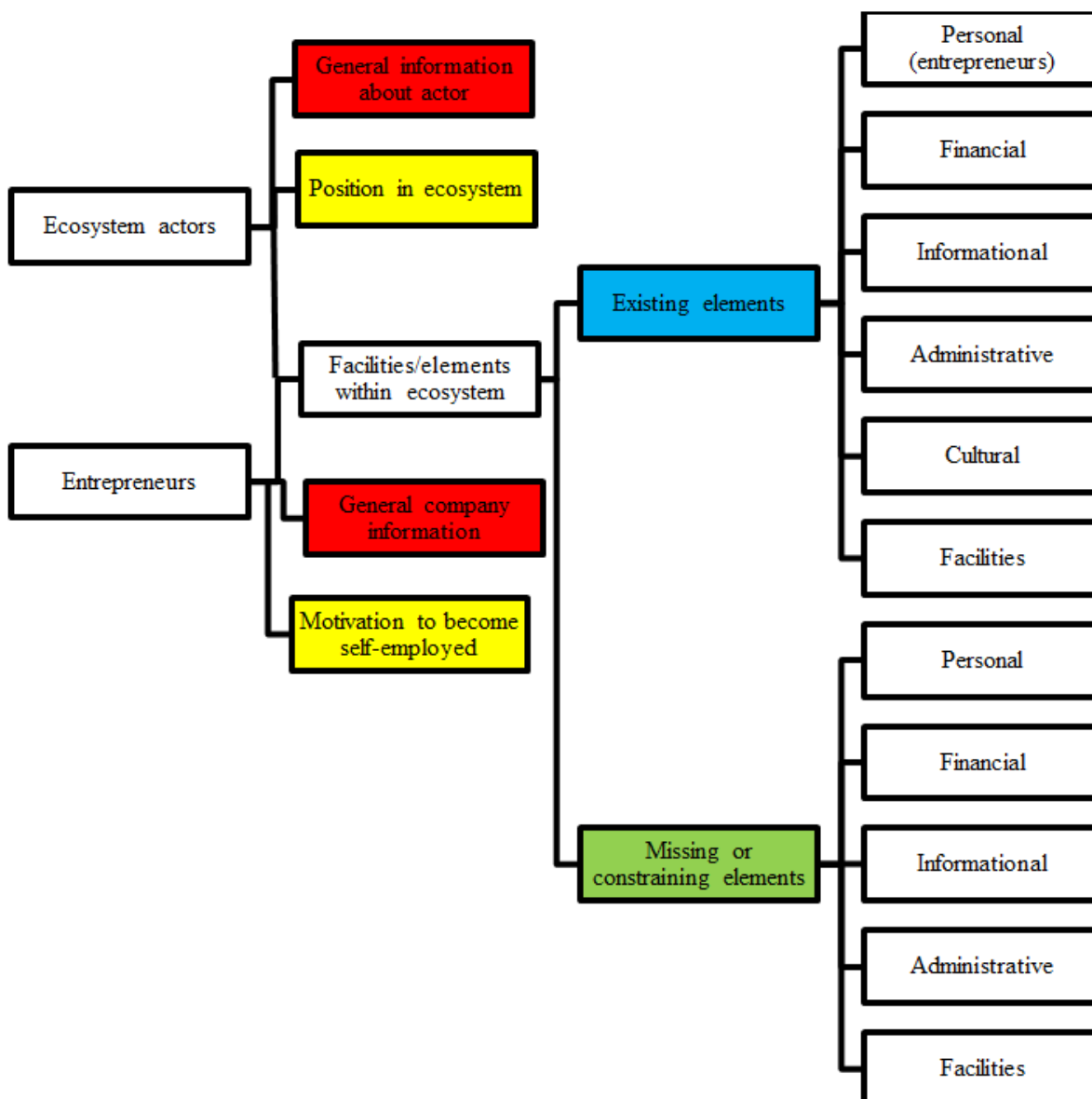


Figure 2 – Coding tree entrepreneurs & ecosystem actors

Information from the interview transcripts were given a color-code, and then assigned to the right category or subcategory. It allowed for a structured comparison between similar themes from different interviews. This comparison is important in order to get a grasp of how the barriers in the Frisian ecosystem are perceived altogether. Furthermore, this way of comparing and analyzing the results enables the researcher to draw conclusions from the data. These conclusions were critically assessed and linked to relevant existent theories. In order to increase validity of the obtained data, triangulation was deployed by checking online

websites, news articles and podcasts (Bryman, Bell & Harley, 2019). These secondary data sources provided additional information and increased the understanding of the Frisian entrepreneurial ecosystem and its peculiarities. For example, the websites of organizations were used (e.g. foundedinfriesland.com, bestart.nl or innovatiepact.frl) as well as a podcast interviewing constituents in the Frisian ecosystem (Boven het Maaiveld) (Founded in Friesland, 2021b).

In short, to answer the question of what barriers must be overcome in order to develop a sustainable valley in the province of Fryslân, a qualitative research method using semi-structured interviews was conducted. By using color coding and thereby allowing a structured comparison of the results, an in-depth understanding of the ecosystem in Fryslân is obtained. A complete understanding of the ecosystem and its respective barriers is essential in generating a way to overcome such barriers. The following section comprises of the outcomes of the current research.

RESULTS

The present section discusses the findings of the data collection. The aim of the research is not only to provide an overview of the current state of the Frisian ecosystem, but also to examine potential flaws, barriers or missing aspects. In total, four nascent sustainable entrepreneurs and six different ecosystem actors were interviewed.

In this section, a general overview of the ecosystem and its players will be provided first. Then, the existing and the missing or constraining elements will be discussed per theme.

The ecosystem – What is already there?

Based on the results, a visual was created of the current Frisian ecosystem in the form of a Prezi presentation (Figure 4). A more detailed description of the current Frisian ecosystem is accessible in Appendix F or through the link in the description at figure 3. The aim of these visuals is to provide readers with a basic understanding of the different players, organizations and interventions present within the region. The ecosystem in Fryslân works with a triple helix model, where the governmental bodies, entrepreneurs and knowledge institutions play a central role and aim to collaborate together. Not only do these different parties collaborate, separate associations are created to facilitate and stimulate this cooperation, such as Vereniging Circulair Fryslân (VCF), the Friese Ontwikkelingsmaatschappij (FOM) and the Innovatiepact Fryslân (IPF). Moreover, the ecosystem aims to differentiate and position itself by promoting specific clusters. One example of it is the WaterCampus, which aims to be the node of the Dutch water technology sector by creating synergies between governmental-, knowledge- and business institutions (WaterCampus, 2021). Most of the ecosystem actors as

well as the clusters are situated in or nearby Leeuwarden, which makes the capital city a central place within the ecosystem.

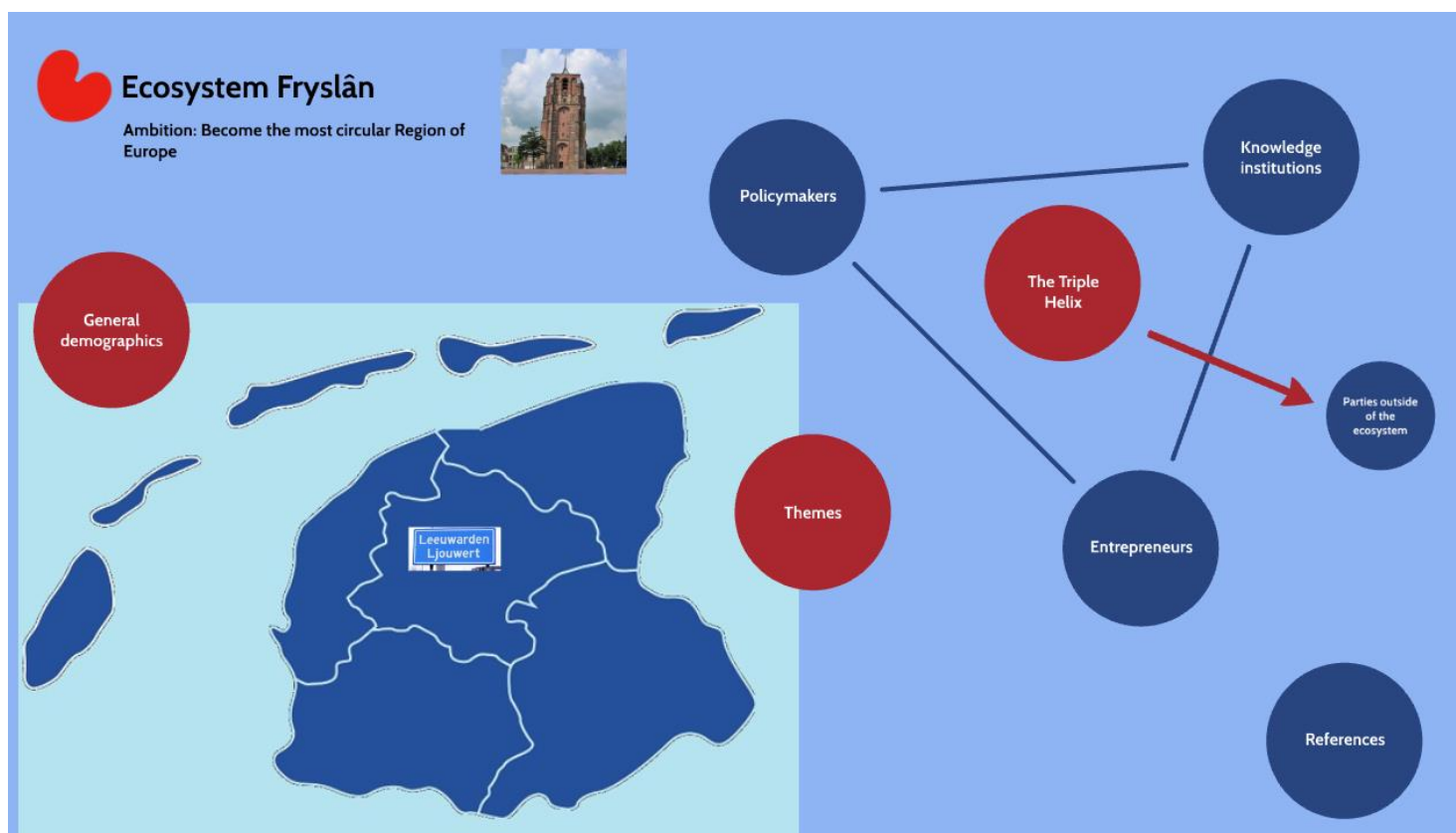


Figure 3 – Visual of the Frisian Entrepreneurial Ecosystem via Prezi.com

(<https://prezi.com/view/13J4DfePLpiQ6Y1zRiq4/>)

Personal

Entrepreneur 1 indicated to have received a lot of support from family members, whereas Entrepreneurs 2 and 3 received this from their friends. However, all entrepreneurs have found setting up a business challenging. Whereas one entrepreneur struggled with insecurities and self-doubt, the other struggled with working inefficient or with communication issues. For example, entrepreneur 1 mentioned: *‘I thought it (entrepreneurship) was going to be really hard. Especially in the beginning, I expected that at some point, I’ll going to run into something that I can’t get over (...) but until that moment, I’ll continue.’*

Financial

Both entrepreneurs and ecosystem actors confirmed that there is already some financial support available, in the form of municipal support or grants. However, perspectives differed slightly, as Interviewee 9 argued that there is plenty of financial assistance available, but that these funds often had a hard time finding the right entrepreneurs or businesses that needed this help.

‘There’s a really nice starters product, in terms of finance. In essence, you should connect this to these educational programs directly. It would make starting a venture very interesting for a starting entrepreneur because there are not many risks involved.’

In contrast, Interviewees 3 and 7 suggested that this financial assistance should be increased. For entrepreneurs, coaching or information with regards to financial assistance was lacking. They did not know where to go or how to acquire access to capital or funding. Another financial difficulty that was mentioned is the limited or stagnating economic growth in the province, that affects the ecosystem’s ability of becoming successful.

Informational

For entrepreneurs, the role of human capital was rather important. Because of the province’s dedication to specific sectors (e.g. the Water technology industry), this results in access to highly skilled people in this field within the region. These skills and knowledge are essential for some entrepreneurs and are, amongst others, one of the reasons for businesses to situate in Fryslân. The entrepreneurs also indicate the significance of the help provided by support service providers, such as Inqubator (Inqubator, 2021) and BeStart (BeStart, 2021). For example, as Entrepreneur 4 mentions about the BeStart program:

“Fantastic! For me, this was the first time. I was astonished, again and again! It was a full year, once a month. (...) I followed the full program and the most important is that it created a network for me, and these people were all truly capable of and super willing to help me! That has been a true trailblazer for me.”

Three of the four entrepreneurs implied having experienced difficulties with standard business practices, and they argued that more assistance in these fields would be helpful. One entrepreneur encountered relatively specific issues as there was no competent assistance available for this respective type of business. Both the entrepreneurs and ecosystem actors mentioned there are some examples of successful, innovative businesses in the province, but there are not really many large businesses, which not only affects the competition and innovativeness, but also the way aspiring entrepreneurs are encouraged to become self-employed. Interviewee 6, 9 and 10 also recalled the challenge for really ingenious or high-tech innovations to make the step towards the market.

Administrative

Both entrepreneurs and ecosystem actors acknowledged the municipal and provincial support for promoting entrepreneurship and the focus on creating a circular region. However, simply a goal was not perceived as enough, and interviewees 6 and 7 argued that the municipalities should commit to this goal more and take further action.

Additional administrative barriers that were mentioned were related to the formal registering of products and other laws and regulations on national or international level. Particularly when it comes to high-tech or sustainable innovations, the international regulations can be constraining as it often takes a long time for them to be put in place, says interviewee 9.

'Imagine you have a sustainable proposition, but the regulations needed for that proposition to succeed are never implemented because they keep being postponed. (...) Regulations should just be clearer and faster so that these kinds of companies also have a chance.'

Cultural & network

The general Frisian demographics (aging population & rural area) might not be prosperous, as they seem to limit the innovativeness of the province. The low-density of the Frisian landscape was both mentioned as an advantage and a disadvantage. It helps nascent businesses in becoming more visible and obtaining access to the different networks. However, it is also constraining when looking for more specific actors or businesses in terms of clientele, for example. The importance of-, and access to the vastly connected network in the province is mentioned repeatedly by both the entrepreneurs and the ecosystem players. Nevertheless, they argue that not all parties are as easily connected throughout this ecosystem, and then it might become a challenge to reach out to the right people. In other words, the goal of the network that is currently created is to create synergies. However, this is currently not always happening because it appears to be challenging to find like-minded and similar people or organizations. The Frisian culture that is characterized by a no-nonsense, hard-working mindset is helpful, Interviewee 6:

'... So the degree of just rolling up your sleeves and get to work is much larger than in other places.'

However, the fact that Frisians are not really open and do not like showing off, does not always affect them positively. A cultural change towards more open branding and more entrepreneurial intention is suggested by the interviewees.

Facilities

Interviewees identified Fryslân as having a unique relationship towards nature and farming, and that this allows for testing sites and testing facilities. Despite these possibilities, interviewees 4 and 6 found that this could be increased. Likewise, the connection between different testing facilities and educational instances should be strengthened in order to facilitate synergies. Interviewees 5, 6, 7 and 9 mentioned that the different knowledge institutions are starting to collaborate more. Interviewee 6:

‘Sometimes you have to reinforce things and just state that we’re not doing a new minor entrepreneurship on Van Hall, because we’ve got an excellent minor entrepreneurship on Stenden, for example. Instead, we can make this minor entrepreneurship on Stenden twice as big. Then we can also connect this minor to the MBO’s because let’s face it; how nice is it if you, as HBO’er, can collaborate with a MBO’er, who can actually make something. This way you can facilitate way more impact, and naturally, the people who will want something in the field of sustainable technologies and entrepreneurship will come together very early.’

This will also benefit aspiring entrepreneurs in their search for innovation, according to interviewee 9.

Other facilities that are already present and successful in the region are those of support service providers, such as the previously mentioned Inqubator, BeStart, but also associations as Founded in Friesland (Founded in Friesland, 2021a) and YnBusiness (YnBusiness, 2021). Together with the knowledge institutions and municipalities, their goal is to promote and stimulate entrepreneurship. Interviewee 5:

‘What you see in Groningen, for example, is that it became an organically emerging ecosystem. Here, in Fryslân, we have to commit interventions to get it done’.

Even though there are many examples of interventions that have been set up, this has not resulted in many new start-ups yet. Interviewees 5, 7 and 9 state that from all the educational programs related to entrepreneurship in Fryslân, only a relatively small group starts their own venture after graduating. Interviewee 7 thinks that this is because of the way the educational programs are equipped. This should be more focused on skills and competencies, and less on providing information. Another remark about the facilities provided is that not all interventions or programs are supplied structurally. According to interviewee 5, structural support is essential in order to facilitate structural change.

As the present section concisely addressed the results from the data analysis, the following section will move on and discuss the conclusions derived from these results.

DISCUSSION

The goal of the current study is to explore the Frisian entrepreneurial ecosystem in order to answer the following research question: ‘*What barriers must be overcome in order to develop a sustainable valley in the province of Fryslân, the Netherlands?*’ In total, four differing nascent, sustainable entrepreneurs were interviewed, together with six different ecosystem actors. In general, there are several attempts to constitute a successful Frisian entrepreneurial ecosystem. Several interventions, support service providers and funding assistance have been set up. Together with the unique peculiarities of the Frisian province, namely the hard-working, no-nonsense culture and the idyllic, rural landscape, this makes it relatively easy to obtain access to the network. People are particularly willing to help each other, as a form of solidarity.

However, it is these same Frisian peculiarities that provide challenges for the entrepreneurial ecosystem to flourish. Operating in a rural area means the population is smaller and the potential market is limited. Similarly, with a no-nonsense culture comes the tendency of being modest, a trait that might not always be useful when aiming to sell or present your products to the outside world. Though the Frisian network seems accessible and is closely connected, it appears that not all facets are involved and that the connection between some parties is not as close as it ought to be. The rural characteristic of the province then becomes a challenge, rather than an asset.

In order for the Frisian entrepreneurial ecosystem to become more successful, and to evolve into a sustainable valley, the above mentioned barriers, or gaps, need to be overcome. The next paragraphs will further elaborate on the meaning, interpretation and discussion of the obtained results.

Different than anticipated previously, the analysis of the results demonstrated additional themes to the ones that Hoogendoorn et al. (2019) identified. These authors describe three main categories: financial, informational and administrative barriers. On the one hand, the current study confirmed the presence of these barriers within the Frisian entrepreneurial ecosystem, implying that indeed sustainable entrepreneurs deal with the challenges proposed by Hoogendoorn et al. (2019). On the other hand, this study identified supplementary themes, such as personal factors, cultural & network-related factors and facility factors that could not be categorized under these three themes. These factors, or themes, presented a distinctive role within the ecosystem. This result implicates that the barriers of Hoogendoorn et al. (2019) do not cover all the barriers that are present within the ecosystem of Fryslân.

One explanation for this could lie in the context where these particular barriers were studied. As each region is different, this implies that no ecosystem can be the same (Cohen, 2006). Accordingly, the extraordinary characteristics of Fryslân could present a different context, resulting in different challenges than, for example, an ecosystem in a more urban area, such as the Randstad or Silicon Valley.

In addition, the methods used may also present an explanation of the differing categories. A diverse research approach or method could affect the distinctiveness of the categories identified. For example, Meijer et al. (2019) identified a broader range of barriers as well, adopting a qualitative approach, using semi-structured interviews. Furthermore, they pursued a focused analysis, looking at the sustainable energy market within the Netherlands (Meijer et al. 2019). This focused perspective on a particular area in combination with a research approach that allows for obtaining exhaustive data might result in more comprehensible categories or themes of barriers. In contrast, Hoogendoorn et al. (2019) employed a quantitative research, conducting surveys of 3000 entrepreneurs in 33 countries. This more superficial approach resulted in fewer categories that appeared relatively general to

entrepreneurs. As the current study was of a qualitative nature, using semi-structured interviews, and also focused on a particular area (Fryslân), this could explain the additional categories found relating to barriers within the entrepreneurial ecosystem. In general, this implies that researchers should not only take into account their research method, but also the desired exhaustiveness of the barriers identified when determining the scope of the research. For example, when examining the ecosystem within a particular area, like the current research, a research method that allows an in-depth understanding of barriers is recommended. This might result in new or supplementary barriers that are unique to the respective ecosystem studied. However, if the goal is to examine general barriers that could occur in multiple ecosystems, then a different approach would be suggested.

Continuing, another finding relates to the structure of the Frisian ecosystem. Even though the resource endowments as described by Stam & Van de Ven (2019), such as intermediaries, talent, knowledge and finance are present within the Frisian context, there also is a significant difference. More specifically, the Frisian entrepreneurial ecosystem is based on collaborations between the (local) government, the knowledge institutions and existing business ventures. This is also referred to as ‘the Triple Helix Model’ and defined as a partnership between governmental institutions, (research) universities and businesses, in order to stimulate growth and development within a particular region (Etzkowitz & Leydesdorff, 1995). As this collaboration is central, it differs from the way ecosystems were described by Isenberg (2011), Stam & Van de Ven (2019) or Cohen (2006).

Yet, this structure is not uncommon within ecosystems. Moreover, Pique, Berbegal-Mirabent & Etzkowitz (2018) studied the development of a famous, successful ecosystem, Silicon Valley, focusing on the role of the Triple Helix actors. Similarly, Brem and Radziwon (2017) demonstrate how the Triple Helix-based collaboration in Denmark could result in an emerging regional entrepreneurial ecosystem. Taking into account the changing demographics

within the province of Fryslân (De Vries, 2020) together with the deficient entrepreneurial endeavors (Van der Beek, 2019), it appears that in order to create a *sustainable valley*, interventions have to be put in place. In Silicon Valley, the collaboration between the Triple Helix actors resulted in more acceleration programs being set up, large corporations starting to cooperate with nascent start-ups more frequently, and funding became more easily available for starting entrepreneurs (Pique, et al., 2018). In the case of Fryslân, such interventions present examples of developments that are essential in order to enable nascent sustainable entrepreneurs to overcome the barriers identified. Setting up the ecosystem by focusing on the Triple Helix Model, then could contribute to a more prosperous ecosystem. For ecosystem research, this implies that the Triple Helix Model could be a fruitful tool to establish the basis of an ecosystem and to support and reinforce its further development.

However, as most of the interventions within the Frisian entrepreneurial ecosystem have been initiated in the past five years, it is essential to take into account the element of time. It takes a while to set up a thriving ecosystem (Mason & Brown, 2014) and as the interviewees indicated, despite the interventions put in place, relatively little start-ups were developed in recent years. The results of such interventions might take a while to notice. Furthermore, it is essential to recognize that the Triple Helix Model is central within the ecosystem, but that there are other elements fundamental as well. For example, Cohen (2006) states that culture might be the most important element of an ecosystem. Similarly, elements such as a supportive physical infrastructure and demand are specified by Stam & Van de Ven (2019).

Observing the Frisian ecosystem and examining its peculiarities led to insights that can help strengthen and develop the future ecosystem, which was the goal of the current research. With these results, the different ecosystem players obtained insights in the things that are already there and that are going well, but also in the things that might not go so well. These results

will give practitioners better insights, knowledge and understanding of the Frisian ecosystem and this will help them in taking further action to develop it into a true *sustainable valley*.

Moreover, for researchers, the insights obtained with this research increases the understanding of ecosystems, or sustainable valleys, in general. Each ecosystem is unique and has its own, specific characteristics, and the Frisian ecosystem is no different. However, learning from existing ecosystem increases the understanding of real-life situations (Munoz & Cohen, 2018) and contributes to the general sustainable entrepreneurship literature.

Limitations & future research

As with any other research, this study is prone to some limitations, which will be addressed in the current section. The focus of this study on the specifics of the Frisian entrepreneurial ecosystem is challenging since it imposes low generalizability towards other ecosystems. However, as Cohen (2006) states, each ecosystem is unique and has its own peculiarities, which reduces the need for generalizability. In addition, the current research mainly focused on what barriers need to be overcome within the Frisian ecosystem, and not necessarily how this can be done. This presents an excellent opportunity for future research. As the interviewees proposed a few suggestions, these are outlined in Appendix G.

Continuing, it is essential to recognize that the current study has a slight focus on Leeuwarden and not necessarily on Fryslân as a whole. This is mainly caused by the fact that most support service providers, such as YnBusiness, Founded in Friesland and Vereniging Circulaire Friesland are situated in Leeuwarden as well. Similarly, both the WaterCampus and the DairyCampus are situated in Leeuwarden, which makes it a central place within the ecosystem. A suggestion for future research would be to expand this view, and examine the specifics of other places, or clusters, within the ecosystem as well.

Similarly, more research is needed for nascent, sustainable entrepreneurs within Fryslân. Due to time and scale constraints, the current study only interviewed four entrepreneurs. Future studies could broaden this by examining more entrepreneurs, conceivably also examining the differences per sector or region. This contributes to mapping the ecosystem.

Mapping the ecosystem is essential, as it allows ticking off boxes of what is already there while it helps identifying missing parts, gaps, or barriers. Ecosystems are continuously evolving (Malecki, 2017) and the current research only provided a snapshot of its current status. Although it provided compelling insights, it is essential to monitor the ecosystem over time. With regards to the investments that are currently made in altering and improving the ecosystem, monitoring its development becomes even more important.

As the province of Fryslân is aiming to collaborate with Groningen and Drenthe more intensively, it would be fruitful to examine the peculiarities of these ecosystems separately or as a whole as well, in order to obtain a better understanding of how they work.

In general, it can be stated that the current research has contributed to the overall understanding of ecosystems, and in particular the Frisian ecosystem. Even though a lot of work has been done already to boost the development of the Frisian entrepreneurial ecosystem, several barriers need to be overcome or eliminated in order to facilitate a wealthy *sustainable valley*.

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APPENDIX

Appendix A. Informed Consent



university of
 groningen

campus fryslân

INFORMED CONSENT

TITLE OF STUDY

Promoting sustainable business ideas in the context of the Frisian entrepreneurial ecosystem

CONTACT INFORMATION

Marije de Boer

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Supervisor: Tom Long

t.b.long@rug.nl

I have agreed to take part in the following study:

'What barriers must be overcome in order to develop a sustainable valley in the province of Fryslân, the Netherlands?'

It is a qualitative research in accordance with the Sustainable Entrepreneurship Project (SEP) of the MSc. Sustainable Entrepreneurship. The purpose of this study is to investigate how Frisian sustainable entrepreneurs perceive barriers to set up their business, and how institutions play a role in this.

I understand and agree upon voluntary participation. I understand that my responses will be kept strictly confidential. I have the possibility to request that my answers will not be used within this study and that I am allowed to withdraw entirely from this study before ***date***. Last, I have the right to decide not to answer particular questions.

The researchers will be held responsible for a discrete and safe process.

The following points have been discussed with the interviewee:

1. The interview will be recorded, transcribed and analysed by the researchers and their supervisors from the University of Groningen.
2. The interview and the transcript will be sent to the interviewee, who has the right to correct, review and approve the transcript before the final report will be handed in. At all times, the interviewee will have access to the interview, its transcript and the report. Last, the final report will be sent to the interviewee.
3. The interviewee has the right and the possibility to take part anonymously and the possibility to be quoted verbatim.
4. In case of additional questions, the interviewee may contact any of the students or the supervisor. Contact information is provided.
5. The informed consent has been discussed entirely with the interviewee. The interviewee agreed upon the consent and is taking part in this study. The interview will take approximately 30 to 45 minutes.

Date:

Signature Participant:

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Date:

Signature Researcher:

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Appendix B. Interview Guideline Entrepreneurs

This interview guideline is structured into three parts. The first part is focusing on the company and the background of the entrepreneur to obtain a general understanding of the entrepreneur and its business. The second section focuses on how the entrepreneur set up its business and the particular barriers he or she has encountered. Once an interviewee has mentioned such barriers or improvements, a follow-up question is being asked with regards to how the interviewee believes this could be eliminated or resolved. Lastly, the third section targets the interviewees' perspective of ecosystem actors, their (lack of) interventions or programs and how this could be revised.

1. General company questions
 - a. Can you explain to me something more about your company?
 - b. How long have you been working as an entrepreneur?
 - c. What were you doing before you decided to become an entrepreneur?
 - d. How did you come in touch with entrepreneurship?
 - i. At what age?

2. Setting up the business & barriers
 - a. How did you set up your business?
 - b. When you started your business, what were your expectations?
 - i. Were there aspects that surprised you? (both positively and negatively)
 - c. What did you find most challenging in setting up your business?
 - d. If you would have to do it all over again, what would you want to see differently?

3. The role of ecosystem actors
 - a. What do you think makes Fryslân interesting for entrepreneurs?
 - b. What do you think aspiring entrepreneurs in Fryslân need to succeed in setting up their business?
 - c. What role do others play in this?

Appendix C. Interview Guideline Ecosystem Actors

The current interview guideline is structured into three parts. The first part mainly focuses on the goal and task of the respective organization or ecosystem player. Then, the second part focuses on the interviewees perspective of the Frisian entrepreneurial ecosystem, what could be improved and what role the different ecosystem actors could play in this. The interview is ended with a question for further suggestions, remarks, additions or notes to give the interviewee with the opportunity to provide additional information, if necessary.

1. Role in the ecosystem

- a. Can you give a brief introduction of *organization*?
 - i. What does *organization* do?
 - ii. What is the goal of *organization*?
 - iii. How did *organization* start?
- b. What is the connection of *organization* to other organization

2. Barriers for sustainable entrepreneurs & acting on these barriers

The goal of my thesis is to identify the different barriers that sustainable entrepreneurs may experience when setting up their business.

- a. Can you tell me a bit more about your experience within the Frisian entrepreneurial ecosystem?
- b. In your opinion, how can sustainable entrepreneurship be promoted and stimulated within the province?
- c. What are things that Frisian sustainable entrepreneurs currently struggle with, in your opinion?
 - i. How could this be solved/improved?
 - ii. What role does *organization* play in this?
 - iii. What role can other organization(s) play in this?

3. Remarks & suggestions

- a. Do you have any remarks, suggestions, additions or other notes with regards to this topic that you would like to share with me?

Appendix D. Codes Entrepreneurs

Code / aggregate theoretical dimensions	Second-order themes	First-order categories
Existing elements or support	Personal	<ul style="list-style-type: none"> - Family assistance - Increasing self-confidence - Assistance of friends (2) - Lack of trust didn't affect one's determination
	Financial	<ul style="list-style-type: none"> - Grants - Municipal support
	Informational	<ul style="list-style-type: none"> - Help from government agency - Importance of human capital (7) - Existing businesses examples (3) - Support service providers – help with general business practices (12) - Unique selling point (USP) – Water technology (2)
	Administrative	<ul style="list-style-type: none"> - Help from government agency - Municipal support (2)
	Cultural & Network	<ul style="list-style-type: none"> - Visibility in Friesland (4) - Friesland's relation to nature & farming - Accessibility & connectedness ecosystem (3) - Willingness to help from network (3) - Importance of and access to network (6)
	Facilities	<ul style="list-style-type: none"> - Friesland's relation to nature & farming (2) - Testing the idea - Accessibility ecosystem - Creating jobs in the North (2)

Code / aggregate theoretical dimensions	Second-order themes	First-order categories
Missing or constraining elements	Personal	<ul style="list-style-type: none"> - Expectation: entrepreneurship is challenging (2) - Expectation: quicker growth of business - Gender (minority) - Self-doubt - Setting up a business takes time, effort & resources (2) - Working with friends is challenging (2) - Working time-inefficient (2) - Communication (3) - Reaching out to others (2)
	Financial	<ul style="list-style-type: none"> - Being risk-averse - Coaching regarding financial assistance (4) - Access to capital (3)
	Informational	<ul style="list-style-type: none"> - No suitable assistance available for type of business (3) - No stable business foundation - Difficulties with standard business practices (4) - Better guidance/direction to facilities/network actors
	Administrative	<ul style="list-style-type: none"> - Registering of products - Setting up a business takes time (4) - No business foundation - Standard administrative business practices (4)
	Cultural & Network	<ul style="list-style-type: none"> - Others lacked trust (2) - Gender (minority) - Getting financial help - Reaching out to others (2) - Easier access to network (2) - Connect different like-minded and similar people or organizations (6) - The Randstad is more accessible
	Facilities	<ul style="list-style-type: none"> - No university in Friesland - A place to work (3) - Possibility to share ideas/inspiration easily (4) - Organize accessible events - Testing accommodations

Appendix E. Codes Ecosystem Actors

Code / aggregate theoretical dimensions	Second-order themes	First-order categories
Existing elements or support	Financial	<ul style="list-style-type: none"> - Financial fund for the validation-period - The FOM is addressing funding market failures
	Informational	<ul style="list-style-type: none"> - Offer inspiration to become an entrepreneur - Sustainability is the standard
	Administrative	<ul style="list-style-type: none"> - The goal of the government for a circular purchasing program
	Cultural & Network	<ul style="list-style-type: none"> - Connection to other parties in the Netherlands (2) - Frisian culture (4) - Collaboration of different ecosystem actors (4) - Importance of and access to network, connectedness (3) - Visibility in Friesland
	Facilities	<ul style="list-style-type: none"> - Regional proposition: caused by large companies, education & talent (5) - Inclusive focus on entrepreneurs with sustainability as a standard - Programs to stimulate & support entrepreneurship of support service providers (9) - Individual that aims to connect different parties - WaterCampus is good at starting companies and self-organizing (2) - Some successful, innovative ventures (3) - Sufficient employees & human capital

Code / aggregate theoretical dimensions	Second-order themes	First-order categories
Missing or constraining elements	Financial	<ul style="list-style-type: none"> - Economic growth is stagnating - Financial support - Sustainable options need to be way cheaper than the conventional options - The connection between funding opportunities and entrepreneurial education
	Informational	<ul style="list-style-type: none"> - Coaching opportunities of business developers (4) - Connection of (high-tech)innovation to the market (4) - Connection in education between water technology & entrepreneurship (2) - Amount of competent successful business examples within Friesland (4) - Finding the right customers who want to adopt your innovation (2)
	Administrative	<ul style="list-style-type: none"> - No compulsory use of innovative products/services - The right laws & regulations ((inter)national level) (2) - The government needs to commit to sustainable/circular purchasing programs (2)
	Cultural & Network	<ul style="list-style-type: none"> - General demographics in Friesland (2) (aging, rural) - Responsibility of actors - Collaboration & connection between different actors to bring synergies (11) - Entrepreneurial intention/knowledge (4) - Collaboration & connections outside the ecosystem - Frisian culture (5) - VCF requires more members to continue making impact - Residents also need to be included - Multidisciplinary/knowledge level of managers, ability to innovate
	Facilities	<ul style="list-style-type: none"> - Frisian ecosystem has to be created – it's not naturally there (4) - Interventions have not really resulted in start-ups (6) - Employment opportunities (2) - Test facilities (4) - VCF needs to take the next step in order to remain successful (5) - Improve programs to stimulate & support entrepreneurs(hip) (7) - More support for the different campuses - An entrepreneurship hub to attract entrepreneurs, employees and new businesses - Finding the right, successful examples (2)

Appendix F. The current Frisian entrepreneurial ecosystem

In order to visualize the current Frisian entrepreneurial ecosystem, a Prezi presentation was made which is also accessible through the following link: <https://prezi.com/view/13J4DfePLpiQ6Y1zRiq4/>

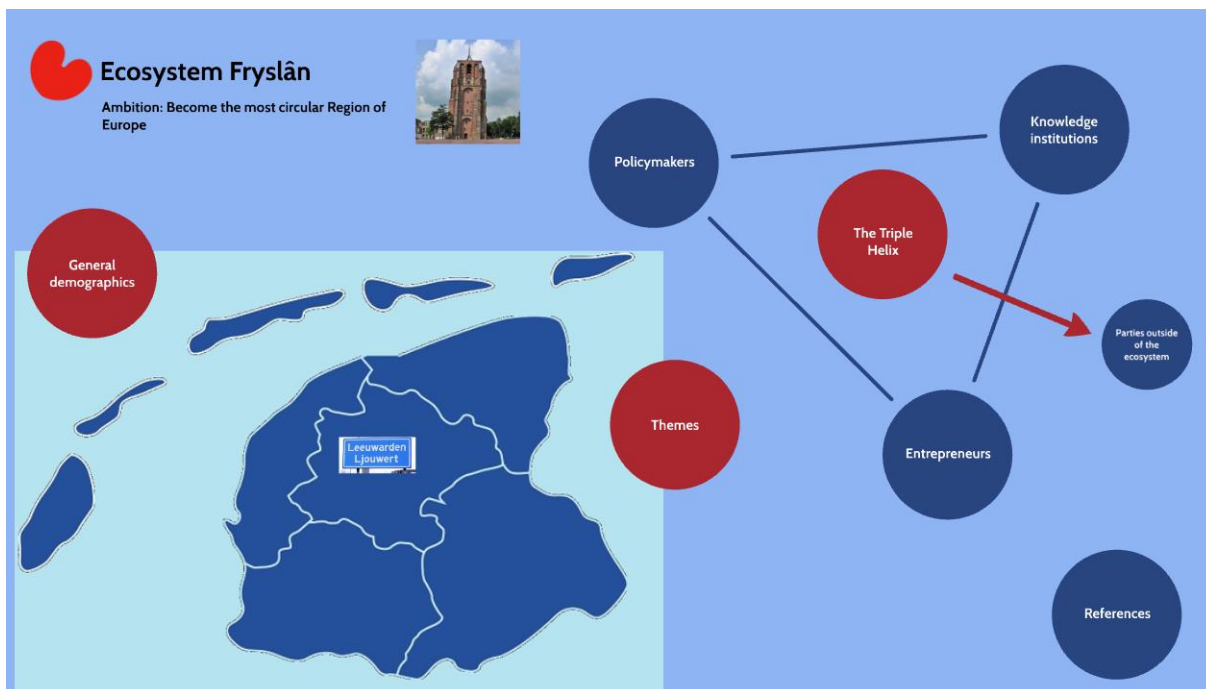


Figure 4 – Overview of the Frisian entrepreneurial ecosystem

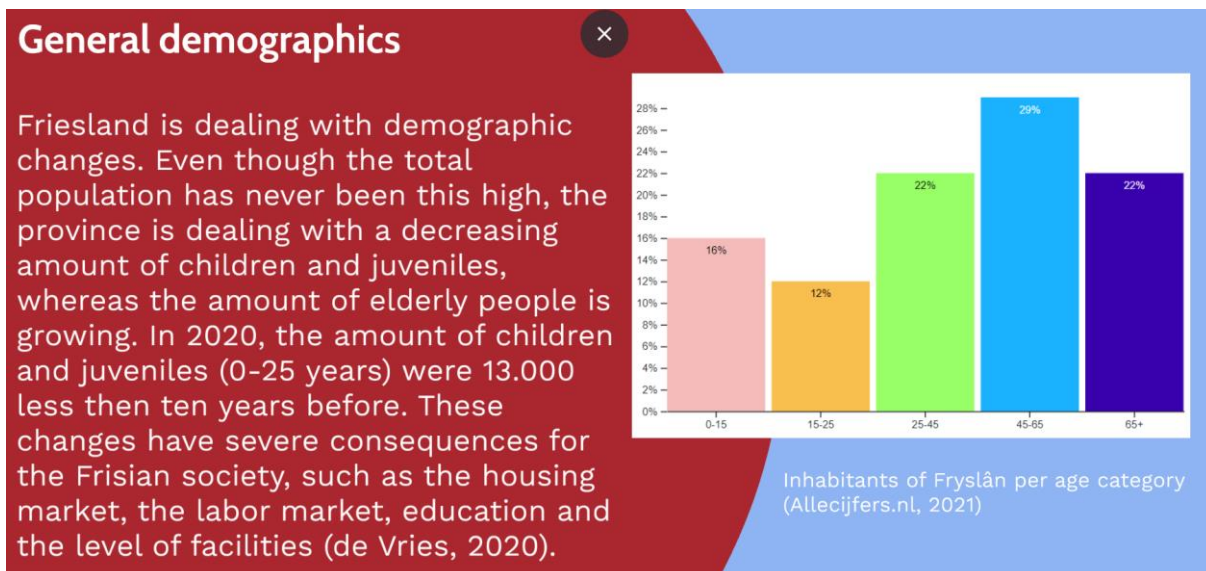


Figure 5 – General demographics

Themes

The province of Fryslân aims to excel in particular areas, themes or clusters. These themes are chosen because of extant prominent business, together with the knowledge or specialism the province had for the particular themes. In general, there are 5 clusters (Innovatiepact Friesland, 2021):

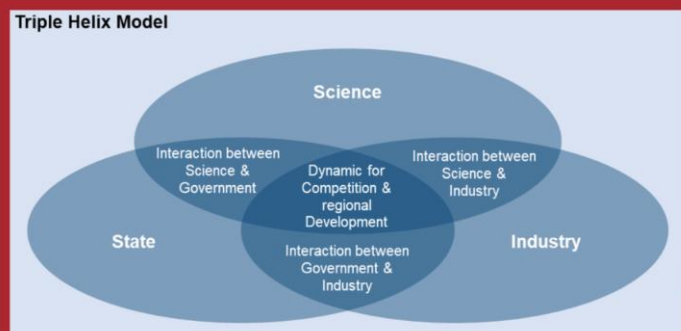
- Water technology
- Agrifood
- High-tech systems & materials
- Maritime technology
- Circular plastics



Figure 6 – Themes in Fryslân

The Triple Helix

The Triple Helix is described as a collaboration between the knowledge institutions, the governmental institutions and the business sector (Etzkowitz & Leydesdorff, 1995)



Innovatiepact
Fryslân

Vereniging
Circulair
Friesland

The FOM

BeStart

Figure 7 – The Triple Helix

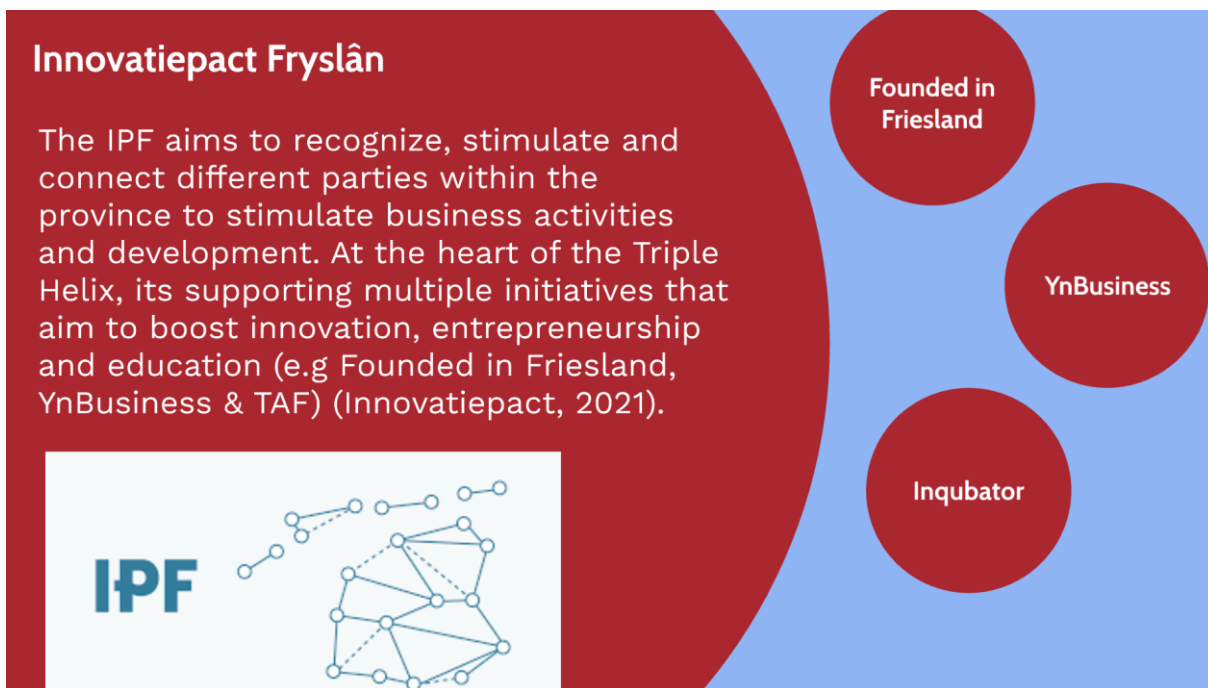


Figure 8 – Innovatiepact Fryslân

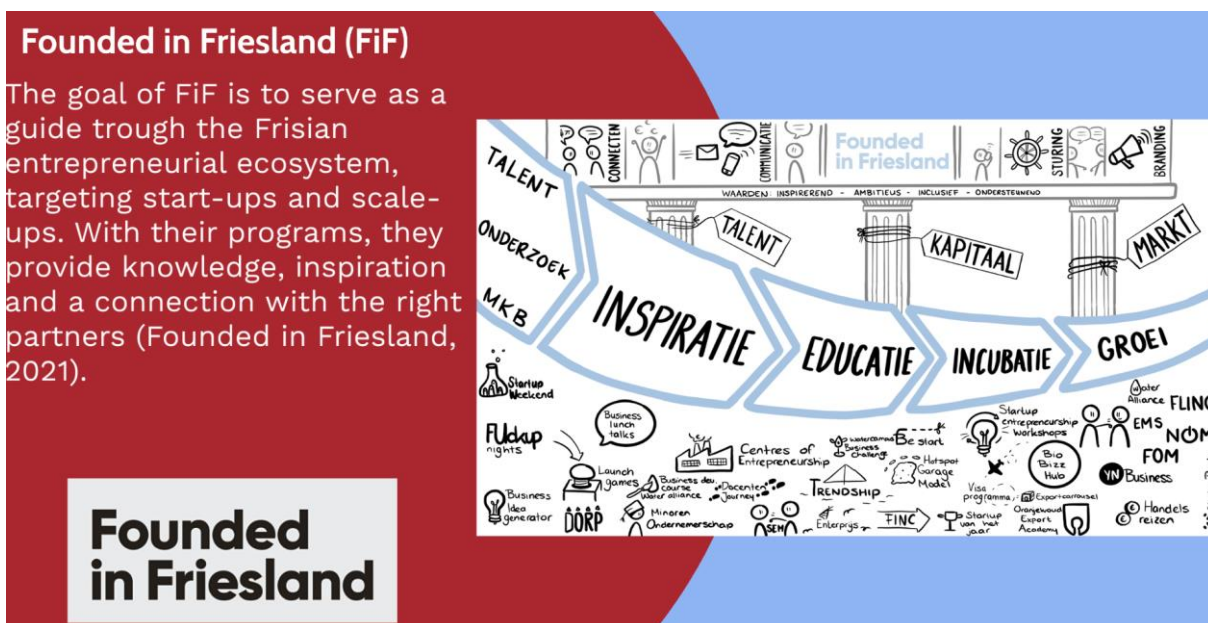


Figure 9 – Founded in Friesland

YnBusiness yn business

The goal of YnBusiness is to support small and medium-sized enterprises (SMEs) with the development of their business. Currently, there are several supportive programs and initiatives for SMEs in Friesland by different partners, and YnBusiness aims to improve the connection between these initiatives and the needs of entrepreneurs (YnBusiness, 2021).



Figure 10 – YnBusiness

Inqubator

Inqubator is an organization supporting start-ups by offering them a workplace, access to their network, monthly interventions and setting up a milestone plan. Their network consists of accountants, lawyers, marketeers, investors and business developers, who are all willing to help these entrepreneurs with a cheaper rate than usual (Inqubator, 2021).



Figure 11 – Inqubator

Vereniging Circulair Friesland (VCF)

VCF was set up by Frisian businesses and aims to stimulate and support circularity within the region by cooperating with businesses, the governmental and knowledge institutions (Circulair Friesland, 2021). They set up meetings for members in order to inspire and motivate them to become more circular. Similarly, they help existing companies become more circular using the CIRCO method, where the existing business model is altered in a more sustainable/circular version. Similarly, they aim to include knowledge institutions as well with the SPARK program. It stimulates students to think of innovative ideas that can solve local environmental, social and economical issues (Circulair Friesland, 2021).



CIRCO

creating business through
circular design

Figure 12 – Vereniging Circulair Friesland

The Friese Ontwikkelingsmaatschappij

The FOM is a unique capital provider, supporting innovating, growing, exporting or starting businesses when other ways of obtaining funding appear incomplete. By addressing this market failure, the FOM aims to support the Frisian economy and create or conserve jobs while, unlike with subsidies, the repayable funds can be reinvested in the province. Their main focus is on small and medium-sized enterprises within Fryslân (FOM, 2021).



Figure 13 – De Friese Ontwikkelingsmaatschappij

BeStart

BeStart is an excellent example of collaboration in Friesland. Set up by Omrin, Ecommunity Park, Wetsus and Paques, BeStart aims to stimulate and support cleantech start-ups with an accelerator program. Start-ups will receive coaching, access to the BeStart network and access to testing facilities to validate the product (BeStart, 2021).



Figure 14 – BeStart

Policymakers

Within the province, different types of policy influences are present, for example:

- The European Union
- The national government
- The province
- Municipalities

As the current study is limited to the Frisian ecosystem, the focus is on the latter two.

Province of
Friesland

Municipalities -
Leeuwarden

F4
Municipalities

Figure 15 – Policymakers

Province of Friesland

The province aims to support the infrastructure in Friesland by setting up programs and interventions that stimulate the connectivity and collaborations. Their slogan is: **'The city as a campus, the region as a testing facility'** as testing novel innovations is essential in order to commercialize them (Provincie Fryslân, 2021).

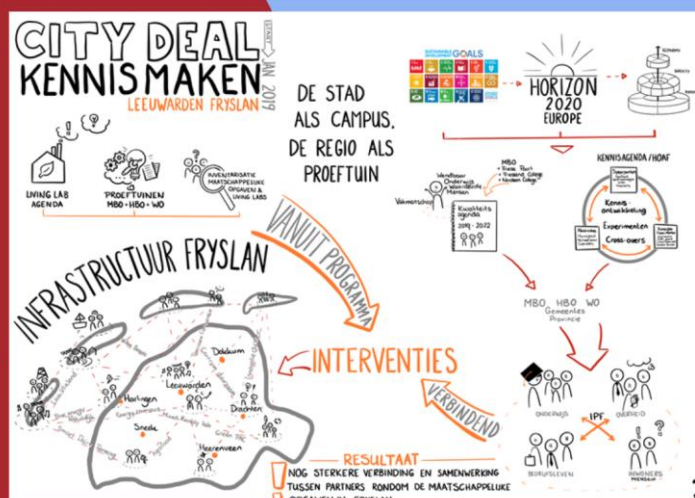


Figure 16 – Province of Friesland

Municipality of Leeuwarden

The municipality has three ambitions:

- Reuse materials and create a waste-free society in 2050
- Purchase circular to stimulate the market
- Put Fryslân in the top 3 of the most circular regions in Europe

In order to achieve these goals, the municipality has set up the following 'tools':

- A strong, supportive network (e.g. IPF, VCF)
- Funding (consultancy, grants & funds)
- European calls
- Launching customership (first customer, test & experiment, media coverage)
- Area-specific approach (with local entrepreneurs)

In this, the municipality aims to adopt a facilitating role (Boersma & Hoekstra, 2021).



Figure 17 – Municipalities: Leeuwarden

F4 Municipalities

The four biggest municipalities in Friesland (Leeuwarden, Súdwest Fryslân, Heerenveen and Smallingerland) decided to combine forces by initiating a significant collaboration of their economic affairs departments. The goal is to strengthen the Frisian economy, increase employment opportunities, and better support for entrepreneurs (Westhreenen, 2018).

Together with the province, these municipalities have been involved with organizations as the IPF, YnBusiness, the FOM and the NOM, for example (Provincie Fryslân, 2021b).

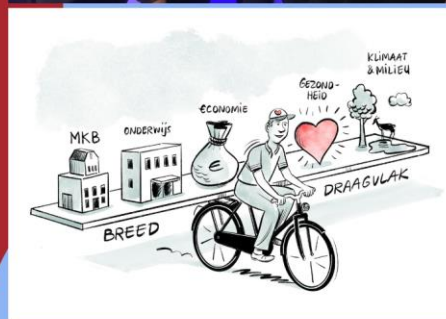


Figure 18 – F4 Municipalities

Entrepreneurs

Entrepreneurs can be categorized into three sections:

- New ventures & start-ups
- Small and medium-sized enterprises
- Large corporations

Within the province, there are relatively many SMEs but not a lot of large corporations or start-ups. For that reason, different programs and initiatives have been set up to stimulate and support entrepreneurship. Such programs and initiatives have been set up for each type of organization.



Figure 19 – Entrepreneurs

Knowledge institutions

There are several knowledge institutions within the province, ranging from practical education providers to a university or research facility.



Campus
Fryslân

Watercampus
Leeuwarden

Other
institutions

Figure 20 – Knowledge institutions

Campus Fryslân (CF)

With the arrival of CF, a department of the University of Groningen (RUG), Friesland now has a University again. The Campus focuses on relevant regional issues, involving international students, PhD's and researchers to approach the topics from differing perspectives. This gives the Campus both a regional and international character (RUG, 2021).

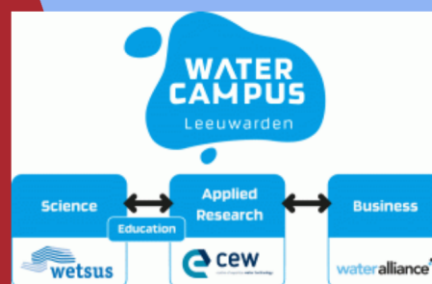


**rijksuniversiteit
groningen**
campus fryslân

Figure 21 – Campus Fryslân

WaterCampus Leeuwarden

The Watercampus is situated in Leeuwarden and is the connection of the Dutch watertechnology sector and aspires to fulfill this connective role for the whole of Europe. It organizes collaboration between (inter)national businesses, knowledge institutions and policy makers within watertechnology, in order to facilitate synergies. It consists of Wetsus (research), Center of Expertise Water Technology (CEW, applied research) and the WaterAlliance (business) (WaterCampus, 2021).



Leeuwarden - The European capital of water technology

Figure 22 – WaterCampus Leeuwarden



Figure 23 – Other knowledge institutions



Figure 24 – Parties outside of the ecosystem

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Figure 25 – References

Appendix G. Suggestions for improvements

Several suggestions for improvements were given by both the entrepreneurs and the ecosystem actors. As some of these suggestions might be fruitful for further research or for further action by the ecosystem actors, they are presented in the current section.

Entrepreneurs suggested the following improvements:

- More and better coaching, not only personal, but also when it comes to financial aspects or business plans. Someone who can monitor your progress and who can steer you in the right direction.
- Group and connect similar companies or like-minded people in an accessible way (e.g. WhatsApp or Facebook groups) in order to create start-up ‘hubs’ and to make it easier to connect with the ‘right’ people.
- A place where people can be connected in order to find their business partner or set up their team.
- Provide access to experienced, knowledgeable experts that can give you more tailored advice (e.g. within a specific sector).
- Assistance with general business practices, such as accounting, sales and marketing.
- Better and more funding opportunities (e.g. in start-up capital).
- Remote working places (offices), which are cheap and accessible.
- More and better possibilities to test ideas and innovations (demo-sites, laboratories).
- A place where people can share their entrepreneurial/innovative ideas in an easy, convenient, low-access way (e.g. landing page, non-committal conversation).
- More cooperation with larger companies in order to use their facilities (e.g. marketing channel) and create synergies.

In addition, the ecosystem actors discussed the following suggestions:

- Align the visions and goals of different ecosystem players in order to make circularity a priority, and not a coincidence (e.g. within all the different municipalities).
- Vereniging Circulair Friesland should initiate structural programs to support businesses in their journey to become more circular. Moreover, it is suggested to include nascent entrepreneurs in such programs as well, rather than just focusing on existing firms.

- Knowledge institutions should focus on connecting existing educational programs with each other, rather than creating new ones. This applies for the whole province. Similarly, students should be taught the skills and competences that come with entrepreneurship better.
- More projects should be created that boost the self-confidence of students, so they are more inclined to start their own venture. For example by providing accessible opportunities for idea-testing.
- Promote the collaboration between existing companies and start-ups in order to assist them in finding a (launching) customer and boost their development.
- Focus on the regional propositions (cluster) rather than aiming to copy another ecosystem. The uniqueness of Fryslân needs to be the focus.
- Just like the water technology cluster, other cluster should become more self-organizing as well, for example by facilitating more collaboration between actors.
- Involve the community/inhabitants of the province in the process of becoming more circular.