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Unlocking the potential of BM meta-models: A framework for creating comprehensive and comprehensible BM representations

Master Thesis – MSc Global Business & Sustainability

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"Simple can be harder than complex" – Steve Jobs

Abstract

Shifting back from the financial profit-oriented paradigm in which we live to a sustainability-oriented society requires businesses to display how their business models (BMs) affect socio-ecological systems in BM meta-models. This trend, however, has initiated the need to rethink how BM meta-models can achieve their two primary objectives of displaying the BMs they aim to describe comprehensively and comprehensibly. This research developed a three-step framework that sets the scene for businesses to develop BM meta-models with a level of simplicity processable by our cognitive minds, while at the same time incorporating all relevant information. The framework relies on four processes that help businesses enhance comprehensiveness and comprehensibility, (1) determine your aim, (2) asses the meta-model's recipient, (3) use multiple BM meta-models, and (4) avoid overwhelm. The framework is innovative, primarily because it relies to a large extent on interindividual differences in the audience of BM meta-models to enhance the comprehensibility of BMs, instead of relying on multivocal symbols and the traits of modularity and standardization. By following the steps in the framework, BM's impact on socio-ecological systems can be effectively shared by businesses. Moreover, it reinforces the meta-models as adequate knowledge-sharing tools for businesses, including the bioregional weaving labs collective, the partner organisation of this research.

Keywords: business model (BM); comprehensibility; comprehensiveness; meta-model; nature-based solution (NBS); system

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BM: business model

BWL: bioregional weaving lab

BMC: business model canvas

CLD: causal loop diagram

FBC: flourishing business canvas

NBS: nature-based solution

ToC: theory of change

Glossary

Term	Definition
Bioregional weaving lab (BWL)	"A facilitated multi-stakeholder partnership process for a bioregion that supports local innovators and stakeholders to engage their communities in collaborative systems change. This is done by co-creating strategies for collaborative systems change that can shape the right conditions for successful integration and scaling of nature-based solutions" (Müller, et al., 2022, p.104).
Bioregion	"In line with (environmentalist) bioregionalism, a bioregion is defined in terms of the unique overall pattern of natural characteristics of a geographical area, including climate, seasons, landforms, watersheds, soils and native plants and animals. Under this definition, people are also counted as an integral aspect of a local's life and a bioregion will therefore entail a unique cultural identity, meaning that livelihoods and the interests of local communities are a key starting point" (Müller, et al., 2022, p.104).
Business model (BM) meta-model	Models of BMs "that consist of elements and relationships that reflect the complex entities that they aim to describe" (Osterwalder, et al., 2005, p. 3).
Cognitive capacity	"The notion of cognitive capacity refers to limits in cognitive processing and task performance that are thought to arise from limits intrinsic to an organism, with these limits being subject to intra- and interindividual variation" (Kleinsorge, 2021, p. 701687)
Comprehensibility	"The quality of being easy or possible to understand" (Cambridge University Press & Assessment, 2023)
Comprehensiveness	The quality of being "complete and including everything that is necessary" (Cambridge University Press & Assessment, 2023)
Institutional Logics	"socially constructed, historical patterns of material practices, assumptions, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time, and provide meaning to their social reality" (Thornton & Ocasio, 1999, p. 804)
Multivocal symbols	"Symbols that can appeal simultaneously to culturally diverse individuals" e.g. words, labels, and shapes (Furnari, 2014, p. 453)
Nature-based solution	"Actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits" (Cohen-Shacham et al., 2016, p. 21).
Scaling	"An ongoing process of increasing the magnitude of both quantitative and qualitative positive changes in society by addressing pressing social problems at individual and/or systemic levels through one or more scaling paths" (Islam, 2020, p. 2)
Social entrepreneurs	"Individuals with innovative solutions to society's most pressing social, cultural, and environmental challenges" (Hussain, et al., 2022, p. XI)
Social Investor	A Social Investor is any vehicle that aims to create social impact – i.e. impact-first or impact-only (Roza, et al., 2018)
Positive social change	"The process of transforming patterns of thought, behaviour, social relationships, institutions, and social structure to generate beneficial outcomes for individuals, communities, organisations, society, and/or the environment beyond the benefits for the instigators of such transformation" (Stephan, et al., 2016)
Socio-ecological system	"A combined system formed by complex interaction between the biosphere and the society nested within it" (Hussain, et al., 2022, p. XI)
Weaving	The practice of interconnecting people, projects, and places to each other and to a shared purpose, fostering collaborations for systemic impact, facilitating collective learning, and embodying the change we wish to see (Müller et al., 2022, p. 6).
Weavers	People who can bring all stakeholders together, support them in their change process and match them with internationally proven solutions, taking the Bioregional Weaving Lab forward. One could also call this person a quartermaster; someone sent ahead to prepare for something entirely new. A forerunner or trailblazer who is skilled in bringing the right stakeholders together for a joint cause (Müller, et al., 2022, p.105).

1. Introduction

1.1. Research context

1.1.1 From profit-oriented paradigm to sustainability-oriented paradigm

Since the start of the Anthropocene in 1950, our world has seen the deterioration of ecosystems as a consequence of human activities, striving for unlimited growth, e.g. deforestation, over-exploitation of resources, and dumping of waste (Meadows, et al., 1972; Raworth, 2017; Rockström, et al., 2009; Steffen, et al., 2015). Many ecosystems are disrupted, and can no longer persist perturbations and shocks to provide the valuable services both humanity and nature benefit from (Steffen, et al., 2015). In consequence, our planet has to cope with different phenomena, ecosystems used to protect us from, and that are causing negative impacts e.g. biodiversity losses, natural disasters (floods, storms, …), global warming, increased poverty and social inequity (Seddon, et al., 2021). In order to reverse this trend, back towards the Holocene epoch, it is fundamentally required that society shifts from a financial profit-oriented paradigm, in which economic development is achieved at a high cost for nature and society, to a sustainability-oriented paradigm, integrating the development of nature and human societies (Meadows, 2009; Steffen, et al., 2015).

Luckily, an increasing number of businesses are taking a step back from traditional business-as-usual methods, and are trying to at least reduce their negative impact on society and the environment (Dyllick & Muff, 2016). In doing so, businesses are more and more taking on a holistic systems perspective to understand how their business models (BMs) affect nature and society via complex and interconnected processes (Williams, et al., 2017). However, while these developments are of course desired, BMs are becoming more complex than ever before, affecting the research stream on formal conceptual BM representations or BM meta-models.

1.1.2. The BM meta-model concept

BM meta-models, simply said, are models of BMs "that consist of elements and relationships that reflect the complex entities that they aim to describe" (Osterwalder, et al., 2005, p. 3). They have two primary purposes. On the one hand, they pursue the comprehensibility, meaning "the quality of being easy or possible to understand" (Cambridge University Press & Assessment, 2023), of BMs' functioning. They do so by abstracting essential elements and relationships of the BM in order to simplify the complex reality and make it understandable to our cognitive capacity (Massa, et al., 2017; Osterwalder, et al., 2005). "The notion of cognitive capacity refers to limits in cognitive processing and task performance that are thought to arise from limits intrinsic to an organism, with these limits being subject to intra- and interindividual variation" (Kleinsorge, 2021, p. 701687). Moreover, BM meta-

models build on multivocal symbols, “symbols that can appeal simultaneously to culturally diverse individuals” (Furnari, 2014, p. 453) (e.g. shapes and labels), and traits (e.g. modularity and standardization) to represent the BM and enhance comprehensibility (Antikainen & Valkokari, 2016; Furnari, 2015; Massa, et al., 2017; Osterwalder & Pigneur, 2010). On the other hand, BM meta-models pursue comprehensiveness, referring to the quality of being “complete and including everything that is necessary” (Cambridge University Press & Assessment, 2023), with the result that BM meta-models aim to present an absolute and detailed representation of a BM, including all relevant aspects by adding different building blocks to the meta-model (Massa, et al., 2017). Typical building blocks represented in a BM meta-metal are key activities, customer interface, and financial costs and benefits (Osterwalder & Pigneur, 2010). BM meta-models are of value for businesses for many different reasons, most commonly, for communication towards stakeholders or to develop strategic thinking within the management team as they allow to capture, understand, and visualize BMs (Burton & Obel, 1995; Osterwalder, et al., 2005; Sterman, 2000; Shaffer, et al., 2019; Zott & Amit, 2010).

1.2. Problem definition

Scholars have agreed that a BM is a complex systems-level concept focusing on how an organisation functions as a whole (Massa, et al., 2018). Representing it in a meta-model requires careful consideration of the balance between the levels of comprehensiveness and comprehensibility, which can create tensions when pursued simultaneously. Overly focussing on comprehensibility might leave important BM building blocks out of the representation, whereas an excessive focus on comprehensiveness may fail to simplify the BM to the extent it is understandable to the cognitive capacity of the recipient. The frequent use of several BM meta-models rooted in the financially-profit oriented paradigm, e.g. the Business Model Canvas (BMC), illustrates that these meta-models managed to find the right balance (Osterwalder & Pigneur, 2010). However, the increasing importance of a BM’s role and functioning within socio-ecological systems has increased BM’s intricacy and has disrupted the balance (Dyllick & Muff, 2016; Massa, et al., 2018). Highlighting this disruption is the causal loop diagram (CLD).

CLDs are BM meta-modelling that recently gained traction in the management literature. CLDs originate in the system thinking literature and have been primarily used for systems mapping (Haraldsson, 2000). Some recent studies, however, have illustrated their potential as BM meta-modelling tools able to include the display of how BM meta-models affect socio-ecological systems, because of their ability to present causal relationships within BMs and to indicate the positive social change (Kiani, et al., 2009; Sarmiento, et al., 2020). Nevertheless, the tool also has significant downsides. On the one hand, CLDs fail to simplify the complexity of a BM as effectively as other BM meta-tools do, as they provide, amongst others, no standardized template and fail to include

modularity in their diagram (Cornforth & Green, 2008; Klang, et al., 2014; Raith, et al., 2021). On the other hand, they provide little space for text and exclude BM content that is typically incorporated in BM meta-models, such as quantitative information on any sort of value created, limiting the information that can be transferred with the model (Kiani, et al., 2009; Sarmiento, et al., 2020). In other words, the tool is not able to meet acceptable levels of comprehensibility and comprehensiveness, contradicting the ultimate purposes of BM meta-modelling tools. Consequently, the management literature needs to rethink how to improve comprehensiveness and display the increased system perspective of businesses, while insisting on the existing level of comprehensibility.

1.3. Objectives

1.3.1. Theoretical

The ultimate objective of this research is to indicate how BM meta-models can cope with the increasing complexity of BMs stemming from a holistic systems perspective applied by organisations to assess their influence on socio-ecological systems and achieve appropriate levels of comprehensibility and comprehensiveness again. To meet the overall objective, this research has two subgoals. First, it aims to discover how businesses' influence on socio-ecological systems can be displayed using BM meta-models, enhancing comprehensiveness. What are the exact elements of the BM that need to be included in the BM meta-model for this purpose, and which BM meta-models are capable to include all of them? Although the literature review indicated the need to display causal relationships, key activities and processes of the BM, and social and environmental value within the meta-model, there exists no agreement on the other critical components necessary to display this impact (Antikainen & Valkokari, 2016; Flourishing Enterprise Co-lab, 2022; Iacob, et al., 2012; Lewandowski, 2016; Massa, et al., 2018; Massa, et al., 2017; …). Secondly, the study aims to investigate how communication on a BM's impact on socio-ecological systems cannot come at the expense of other important BM content, including their simplification, in order to enhance the level of comprehensibility. The literature indicates multivocal symbols and specific traits in the meta-model are important to simplify a BM's functioning (Antikainen & Valkokari, 2016; Furnari, 2014; Furnari, 2015; Massa, et al., 2017; Osterwalder & Pigneur, 2010). However, what other means are available to keep the information as simplified and clear as in existing BM meta-models?

Following the objectives, the following research question stands in force:

"How can businesses restore the disrupted levels of comprehensibility and comprehensiveness in BM meta-models stemming from the growing importance of BM's impact on socio-ecological systems?

1.3.2. Practical

The research also has a practical objective framing within the partnership of the Bioregional Weaving Labs (BWLs) collective and the Rotterdam School of Management, which underpins this research and is further expounded in the methodology section. Briefly stated the BWLs collective has a mission of mobilising one million changemakers by 2030 to protect, restore and regenerate 1 million hectares of Europe's land and sea. One of their strategies to achieve their mission is to scale systemic innovation, with the help of a portfolio of nature-based solutions (NBSs). In recent years, NBSs have been proposed as an effective solution to combat the deterioration of ecosystems in an effective, affordable and sustainable way (Seddon, et al., 2021). As defined by the International Union for Conversation of Nature (IUCN), NBSs are "actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits" (Cohen-Shacham, et al., 2016, p. 21). Specifically, NBSs create four different types of landscape returns, (1) inspiration, (2) social return, (3) natural return, and (4) economic return, briefly outlined in Figure 1 (Dudley, et al., 2021). The idea behind NBSs is that humanity should work with nature and each other again, rather than taking advantage of it for its own sake and the sake of all living things in this world (Müller, et al., 2022). Successful NBSs will restore or protect the desired functioning of ecosystems and allow for a more sustainable and resilient future (Seddon, et al., 2021).

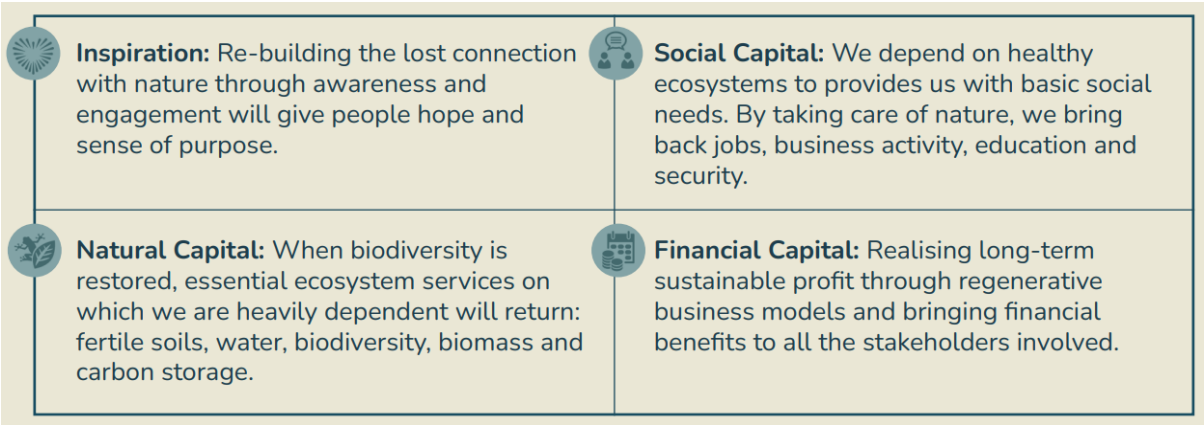

Figure 1: The 4 returns of landscape restoration, created by NBSs (Müller, et al., 2022)

The BWLs collective makes up a dignified partner for this research, because of two reasons. First of all, NBSs are fundamentally rooted in the sustainability-oriented paradigm and their working is centralized around their impact on socio-ecological systems, making them utmost suitable to study and answer the research question with (Cohen-Shacham, et al., 2016; Dudley, et al., 2021; Mayor, et al., 2021). The BWLs collective was able to provide the expertise on the topic of NBSs, including a network of NBS practitioners, necessary to bring this research to fruition.

Secondly, and most importantly, the BWLs collective offered an interesting line of inquiry, very much related to the overall objective of this study. A 2022 study by Hussain and colleagues, launched by the BWLs collective, indicated that lack of collaboration still operates as a fundamental barrier to scale NBSs, pointing out, amongst others, that information and knowledge exchanges do not run as smoothly as one might expect between different stakeholder groups. Often highlighted as underlying this lack of collaboration are, according to the study, distinct institutional logics between stakeholder groups. Institutional logics are the "socially constructed, historical patterns of material practices, assumptions, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time, and provide meaning to their social reality" (Thornton & Ocasio, 1999, p. 804), and resulted, amongst others, in conflicting operational languages and time frames between the three institutions, i.e. stakeholder groups, identified by the BWLs collective as crucial in the process of scaling positive social change with NBSs. These stakeholder groups are (1) social entrepreneurs, who create specific NBSs; (2) weavers, who function as field workers and connect people, cultivate meaningful relationships, and foster collaboration to scale NBSs (Hussain, et al., 2022); and (3) social investors, who bridge the fundamental finance gap that exists for NBSs (Müller, et al., 2022). However, BM meta-models should, because of their ability to capture, visualize, and make BMs understandable, be able to create a common language and bridge the institutional differences between these stakeholders, hence fostering communication and collaboration (Osterwalder, et al., 2005). Consequently, the study aims to illustrate how BM meta-models can cope with these different stakeholders' needs and interests and function as adequate knowledge-sharing systems that help the BWLs collective scale positive social change with NBSs. The objective is to dig deeper into what weavers, social entrepreneurs and social investors need and how this can be leveraged to enhance the comprehensiveness and comprehensibility of BM meta-models. Moreover, in an increasingly interconnected world requiring multi-stakeholder collaboration, this study aims to generalise these insights to the extent it contributes to other practitioners.

1.4. Contributions

This research proposes a three-step framework that sets out the lines for businesses to display BMs in BM meta-models comprehensively and comprehensibly. By following the steps, businesses can restore the disrupted levels of comprehensiveness and comprehensibility in these meta-models, stemming from the growing attention to a BM's impact on socio-ecological systems. Regarding the comprehensiveness of BM meta-models and, thus, the inclusion of all relevant aspects, this research has determined the fixed elements necessary to display a BM's socio-ecological impact. Three building blocks were already identified in the literature, namely the causal relations present in the BM, the BM's key activities and processes, and the social and environmental value created by the BMs.

However, scholars had not reached an agreement over any other critical elements (Antikainen & Valkokari, 2016; Flourishing Enterprise Co-lab, 2022; Iacob, et al., 2012; Lewandowski, 2016; Massa, et al., 2018; Massa, et al., 2017; …). This research contributes that only one other element is necessary to display BM's impact on socio-ecological systems, namely, the initial context and needs of the affected socio-ecological system. To further enhance comprehensiveness, businesses should consider the aim of their BM meta-model use and the needs and interests of the audience to identify all relevant aspects that need to be included in the model.

However, the main contribution of the three-step framework is related to the enhancement of comprehensibility. The framework is innovative and contributes to the research stream on BM meta-models because it urges businesses to asses three variables peculiar to a specific individual (function, personal background, and personal preference) and choose a BM meta-model in function of the outcomes of the assessment to make the meta-model comprehensible for its audience. Interindividual differences have for a long time been acknowledged as determining an individual's cognitive capacity (Kleinsorge, 2021; Mikolon, et al., 2015), however, despite one of the primary goals of BM meta-models, namely, making the BM comprehensible to cognitive capacities, they are overlooked in the BM meta-model literature where the focus lies primarily on standardization and modularization of BM meta-models and the use of certain multivocal symbols to achieve comprehensibility (Osterwalder & Pigneur, 2010; Massa, et al., 2017). Consequently, BM meta-models are a bit more limited in bridging institutional differences than first thought (Osterwalder & Pigneur, 2005). After all, businesses are required to understand the thinking and behaviour of the BM's audience and adapt the BM meta-model to it, rather than that any BM meta-model is universally understandable. Moreover, because of an increasingly interconnected world, in which multi-stakeholder collaboration is expanding to achieve the sustainable development goals, it is argued that assessing the recipient of the meta-model will become increasingly important as recipients will become increasingly diverse (United Nations, 2023). Furthermore, the three-step framework considers the importance of determining the aim of the BM meta-model usage and the use of multiple meta-models to simplify the complexity of BM meta-models, two means which were not previously pushed forward as means to enhance comprehensibility in the BM meta-models research stream, which is dominated by the BMC of Osterwalder & Pigneur (2010) (Massa, et al., 2017).

Specifically to the work of the BWLs collective, this research contributes on two different grounds. Firstly, the research recommends BM meta-models as adequate-knowledge sharing systems for the BWLs collective, primarily to obtain funding. Social entrepreneurs need to adapt BM meta-models to the needs and interests of the meta-model audience, rather than being shaped within the mindset of the creator. To be of help, the study provides insight into the needs and interests in BM meta-models of different actors working in the context of NBSs, most notably weavers and social investors. Although

this information is helpful e.g. BM meta-models should include a discussion of the competitive environment of a BM, capabilities of the management team, and issues to scale the innovation in communication between social entrepreneur and social investor, interindividual differences in personal background preference avoid a clear generalization of different stakeholder groups' needs and interests. Also, the need to know what information a social investor requires was specifically mentioned as a need of the BWLs collective (BWLs collective, personal communication, February 2023). Secondly, the mapping of the NBSs in BM meta-models results in more in-depth information on the BMs sustaining different NBSs, which was also, specifically mentioned as a need by the BWLs collective. BM meta-models are particularly useful for reducing the complexity of the NBSs and therefore getting information on the basic BM sustaining the innovation. This in its own turn is very useful as "understanding every element of the BM could allow a company to streamline its application portfolio" (Osterwalder, et al., 2005, p. 19).

2. Literature review

This section illuminates the relevant literature for this research. First, the study's position in the BM literature is indicated (2.1). Second, it is explained why BM meta-models are required for communicating, inherently, complex BMs (2.2). Third, a summary is provided of the existing literature on BM meta-models (2.3), followed up by an account of why BM meta-models should include BM's impact on socio-ecological systems nowadays (2.4). Finally, the CLD is introduced, leading to the need for new means to enhance comprehensiveness and comprehensibility in BM meta-models (2.5).

2.1. Position in the literature

After being mentioned for the first time in an academic article in 1957, the literature on BMs started to grow exponentially by the end of the 20th century (Bellman, et al., 1957; Osterwalder, et al., 2005). This growth has been characterised by a divergent nature, as scholars infused the BM concept with language relevant to their own targeted audience, slowly fading the original foundations upon which the BM concept was built (Klang, et al., 2014; Massa, et al., 2017; Zott, et al., 2011). By 2010, different theoretical perspectives and methodological approaches ramified to an extent that it seemed impossible to move back to formulate one overarching, accepted foundation of the BM (Klang, et al., 2014). Rather, scholars have tried to identify typologies of unifying research streams, with each stream having its own theoretical foundations (e.g. Massa, et al., 2017; Osterwalder, et al., 2005; Zott, et al., 2011).

This study acknowledges the typology of Massa, et al. (2017) to locate its position in the BM literature. The typology distinguishes between three different interpretations of the meaning and function of BMs: (1) BMs as attributes of real firms, referring to how firms do business; (2) BMs as cognitive and linguistic schemas, referring to how the way firms do business is interpreted by organisational members; and (3) BMs as formal conceptual representations of how a BM functions, referring to how BMs can be represented by meta-models (Massa, et al., 2017). The research in this paper belongs to the latter category. For a detailed description of the theoretical foundation of each of the two former research streams, I refer to Massa, Tucci and Afuah (2017).

2.2. Communicating complexity

Most basically, every human disposes of a cognitive capacity allowing him or her to take up and process information in a given situation (Mikolon, et al., 2015). "The notion of cognitive capacity refers to limits in cognitive processing and task performance that are thought to arise from limits intrinsic to an organism, with these limits being subject to intra- and interindividual variation." (Kleinsorge, 2021, p. 701687). The higher the number of elements and interdependencies between the elements that need

to be processed, the more complex the information, and the higher the percentage of cognitive capacity humans will invoke (Halford, et al., 2007). However, this cognitive capacity has, thus, already for a long time been acknowledged as limited, and it is possible that the complexity of the information transcends our cognitive capacity (Bettman, 1979). Under this scenario, simplification of information is required to be able to process the information and bring it into the spectrum of our cognitive capacity (Walsh, 2018). Simplification is "the process of making something less complicated and therefore easier to do or understand or the thing that results from this process" (Cambridge University Press & Assessment, 2023). There are different ways in which information can be simplified, such as creating visualizations, telling narratives, or simply reducing the amount of information (Walsh, 2018; Osterwalder, et al., 2005). It is important to emphasize that there exist differences in individuals' cognitive processing power, either congenital or because of differences in institutional logics, causing different persons to require different levels of simplification (Mikolon, et al., 2015).

Within the management literature, different scholars have indicated the value of formal conceptual representations or BM meta-models to make sense of the complexity of BM's functioning (e.g. Burton & Obel, 1995; Massa, et al., 2017; Osterwalder, et al., 2005; Sterman, 2000). Scholars agree on BMs being a systems-level concept, explaining on a holistic level how a firm does business and meta-models allow us to deal more easily with this concept (Massa, et al., 2018; Zott, et al., 2011). Ultimately BM meta-models chase two different objectives. On the one hand, they pursue the comprehensibility of BMs by simplifying the complex reality they aim to describe. They abstract essential elements and relationships of the BM in order to simplify the complex reality and make this reality, therefore, more understandable for stakeholders, allowing them to grasp the overall structure and functioning of a BM (Massa, et al., 2017; Osterwalder, et al., 2005). "To model is to simplify, to abstract what is unnecessary or minor, with the goal of improving tractability" (Massa, et al., 2018, p. 63). In addition, BM meta-models consist of different semantics, such as symbols (e.g. plus, minus, …) and shapes (e.g. triangles, arrows, …), and traits, such as modularity and standardization that contribute to the comprehensibility of BMs (Antikainen & Valkokari, 2016; Furnari, 2015; Massa, et al., 2017; Osterwalder & Pigneur, 2010). On the other hand, BM meta-models pursue comprehensiveness and aim to provide a complete and as detailed as possible representation of a BM, incorporating all relevant aspects. This requires careful consideration of what BM components should be represented within the meta-model e.g. economic model, customer interface, partner network, …, however, no agreement exists among scholars on what these critical components are (Massa, et al., 2017).

Within the BM literature on formal conceptual representations, many different meta-models have been proposed throughout the years to capture the essence of how a BM functions. Section 2.3. of this research provides a summary of this literature.

2.3. The existing BM meta-model literature

2.3.1. The inadequacy of traditional BM meta-models

Many traditional meta-models such as the famous BM canvas of Osterwalder & Pigneur (2010), presented in Figure 2, and the BM navigator by Gassmann et al. (2014), have proven their value for the management literature, facilitating easy communication, explaining what different firms do, indicating the stakeholder value, and more (Coes, et al., 2014; Cosenz & Noto, 2018; Stenn, 2017). While reducing complexity, the meta-models remained effective in transferring how value is created, delivered, and captured by a business (Coes, et al., 2014). However, these BM meta-models have also been criticized for two major reasons.

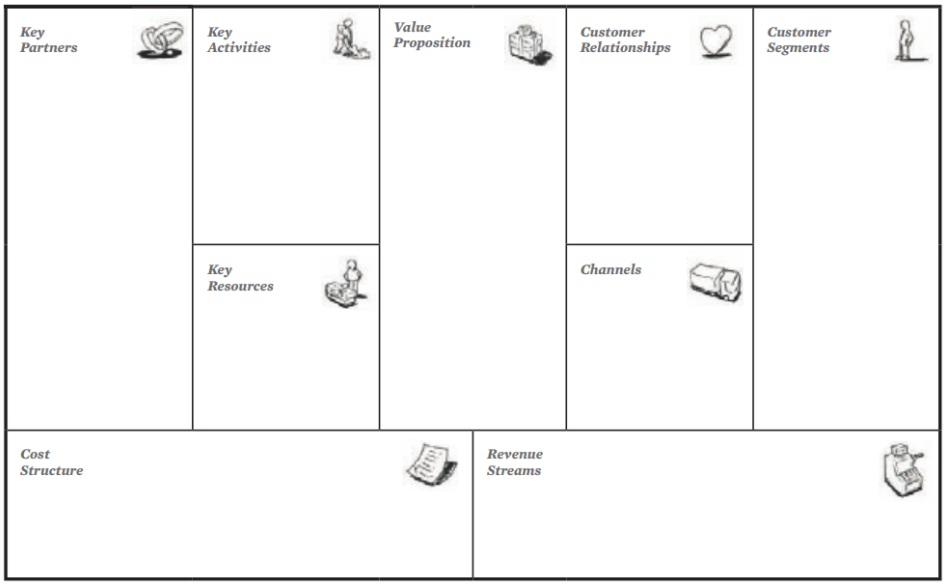

Figure 2: The Business Model Canvas (Osterwalder & Pigneur, 2010)

First, for creating a static blueprint and excluding mechanical relationships, linking value-creating, value-delivering, and value-capturing activities (Burkhart, et al., 2011; Furnari, 2015; Shaffer, et al., 2019). Rather, a BM should, as mentioned, be viewed as "a system that is made up of components, linkages between components, and dynamics" (Afuah & Tucci, 2001, p. 4), indicating the fundamental importance of relations and causal structures in the BM (Furnari S., 2015). Causal structures are essential to be studied for a lot of different reasons, amongst others, to test a BM's market fitness; to assess the systems perspective of BMs; to study the relations between different BM components; to understand how a BM will shift in its competitive environment, to innovate the BM, to calculate the effect of external influences on the BM, …, and should, therefore, not be excluded from a formal conceptual representation (Chen, et al., 2019; Iacob, et al., 2012; Shaffer, et al., 2019; Zott & Amit, 2010; Zott, et al., 2011).

Second, for being fundamentally rooted in the financial profit-oriented paradigm. The BM building stones of Osterwalder & Pigneur (2010), Gassman et al. (2014), and others originated in traditional economic mindsets, focused on strengthening the competitive position in a constantly changing environment and on the creation of economic value rather than social and environmental value (Shaffer, et al., 2019; Sparviero, 2019; Upward & Jones, 2016). Accordingly, these conceptualizations are insufficient to capture the long-term social, environmental, and inspirational value social enterprises and like-minded (e.g. the BWLs collective) create, next to economic value, with their sustainable BMs. The following subsection discusses how the academic literature has tried to address both critiques.

2.3.2. Addressing the deficiencies of traditional BM meta-models

In order to make BM meta-models less static, so-called, formal dynamic BM conceptualizations have started to show up (Chen, et al., 2019; Cosenz & Noto, 2018; Furnari, 2015; Iacob, et al., 2012). Furnari (2015), for example, which acknowledges BMs as cognitive and linguistic schemas, provides a methodology for drawing causal structures between the building constructs of the Baden-Fuller & Mangematin (2013) BM meta-model, to represent entrepreneurs' and managers' cognitive beliefs of a BMs' functioning. Another example comes from Cosenz & Noto (2018), which illustrates how connections, existing between the components of a (modified) Osterwalder & Pigneur's (2010) BMC, can be visualized. These types of representations do allow studying the relationships of BMs for the purposes mentioned before, but do not get rid of the traditional economic mindset in which they are rooted. The dynamic BM framework by Cosenz & Noto (2018) is presented in Figure 3, as an example of formal dynamic BM conceptualizations.

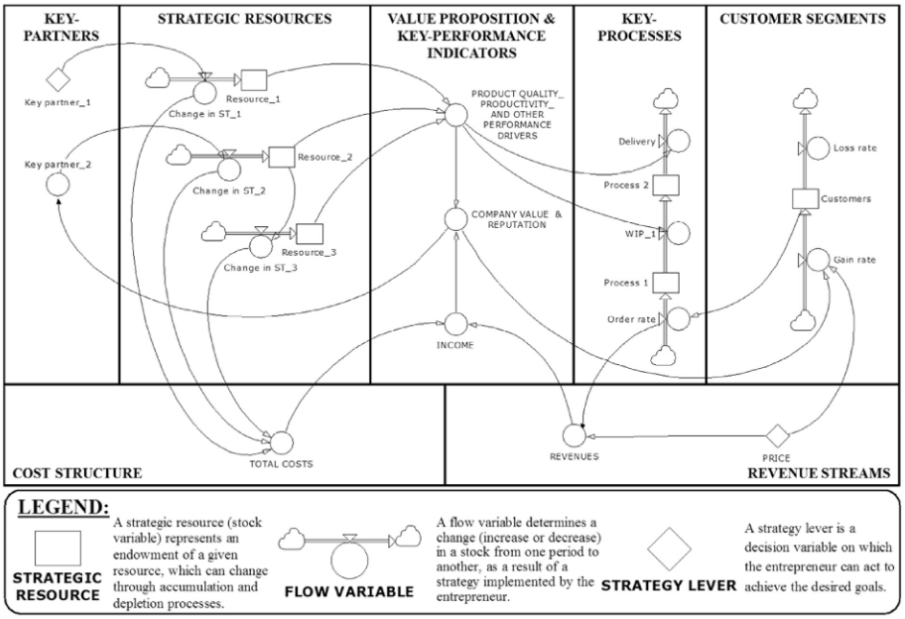

Figure 3: The Dynamic BM framework (Cosenz & Noto, 2018)

To address the second critique, scholars have attempted to pull BM meta-models, especially the BMC by Osterwalder & Pigneur (2010) out of the traditional economic mindset by adapting it to incorporate societal and environmental value creation/destruction (Antikainen & Valkokari, 2016; Flourishing Enterprise Co-lab, 2022; Lewandowski, 2016; Mayor, et al., 2021; Sparviero, 2019). Sparviero (2019), for example, created a 'social enterprise model canvas', by adding building blocks to the BMC that capture non-targeted stakeholders, principles of governance, targeted beneficiaries other than customers, mission values, and other related aspects focused on designing the organisational setting of social enterprises. It is within this context also, that the European Commission attempted to develop BM meta-models, specifically for the purpose of mapping NBSs, during its H2020 projects (Mayor, et al., 2021). The two most promising tools developed during this research were the 'Connecting Nature NBS business model canvas' and the 'NAIAD NAS' canvas. However, arguably the best attempt to modify the BMC to account for social and environmental value creation/destruction comes from the Flourishing Enterprise Co-lab (2022), which work originated in a 2013 study by Antony Upward. The Flourishing Business Canvas (FBC) helps organisations "fully integrate social benefits, environmental regeneration and financial viability" (Flourishing Enterprise Co-lab, 2022) and is presented in Figure 4.

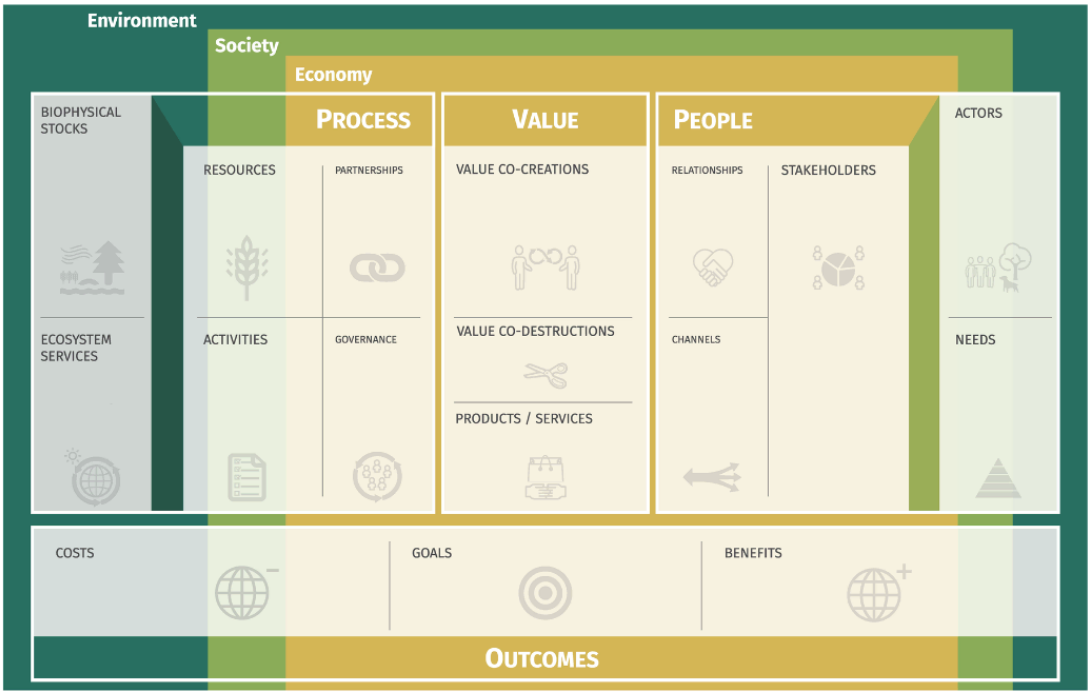

Figure 4: Flourishing Business Canvas (Flourishing Enterprise Co-lab, 2022)

While these BM meta-models get rid of the traditional economic mindset acknowledging social and environmental value, all these meta-models fall short again in providing a dynamic blueprint of the BM, excluding causal structures, which were, as a reminder, amongst others, necessary to assess a BM system's perspective and to assess the effect of external influences on the model (Iacob, et al., 2012; Shaffer, et al., 2019; Zott, et al., 2011)

2.4. Businesses' increased systems perspective

Shifting from a financial profit-oriented paradigm to a sustainability-oriented one, businesses are required to adopt a holistic systems lens to understand how their activities affect socio-ecological systems (Williams, et al., 2017). How the paradigm shift affects businesses, is, arguably, best explained by Dyllick & Muff (2016) in their Business Sustainability Typology. Their typology is presented in Table 1, followed by a brief explanation of each stage derived from Dyllick & Muff (2016).

Table 1: The Business Sustainability Typology (Dyllick & Muff, 2016)

BUSINESS SUSTAINABILITY TYPOLOGY (BST)	Concerns (What?)	Values created (What for?)	Organizational perspective (How?)
Business-as-usual	Economic concerns	Shareholder value	Inside-out
Business Sustainability 1.0	Three-dimensional concerns	Refined shareholder value	Inside-out
Business Sustainability 2.0	Three-dimensional concerns	Triple bottom line	Inside-out
Business Sustainability 3.0	Starting with sustainability challenges	Creating value for the common good	Outside-in
The key shifts involved:	1st shift: broadening the business concern	2nd shift: expanding the value created	3rd shift: changing the perspective

First, businesses move from the business-as-usual state, rooted in the traditional economic paradigm, toward sustainability 1.0, where environmental and social topics are considered in strategy or decision-making for the first time. It concerns social and environmental topics that are acknowledged as challenges - opportunities or risks - to the organisation, because of, e.g. stricter regulations, stakeholder activism, and potential cost reduction. The main goal remains to create profits for the shareholders. Secondly, an organisation realizes social and environmental capital have intrinsic value and should not only be taken care of when it indirectly benefits shareholders. In the sustainability 2.0 phase, an organisation will consider economic, as well as social and environmental value of importance, however, it remains limited to the minimisation of negative social and environmental impact. Finally, towards sustainability 3.0, an organisation shifts its mindset from minimizing negative impacts ('less bad') toward creating positive impacts ('more good'). What's fundamentally different from sustainability 2.0, is the organisational perspective. Firms at sustainability 3.0 start by looking outside of their organisation and formulate their business around solving a social or environmental challenge in their external environment (outside-in), whereas, sustainability 2.0 firms will first

determine their business practices and then look outside, at how they should limit negative impacts in the external environment (inside-out).

For organisations situated in the sustainability 2.0 or 3.0 phase, it is, because of their inside-out or outside-in perspective, of fundamental importance that a holistic systems lens is set up to understand how their business affects socio-ecological systems. These developments, however, affect the research stream on formal conceptual BM representation or BM meta-models. Where scholars tend to agree on BMs being a systems-level concept already, focusing on how an organisation functions to achieve its goals, the BM becomes an even more complex system when taking into account its impact on socio-ecological systems (Massa, et al., 2018). An increasing complexity that needs to be reflected in BM meta-models, since they are now an important part of the BM's value proposition (Dyllick & Muff, 2016).

To include the increased systems' perspective, the meta-model should, on the one hand, provide space to indicate the economic, social and environmental value created by the BM, as, for example, the FBC succeeded in. On the other hand, a system is more than the sum of its parts, so to provide this complex information correctly and completely causal structures must be implemented within the conceptualization (Iacob, et al., 2012; Massa, et al., 2018; Shaffer, et al., 2019; Zott, et al., 2011). As noted by Massa et al. (2018), "The more we move from simpler to more complex systems, the less the level of the static framework is sufficient in providing a comprehensive picture that would allow understanding the system" (p.63). Only by meeting both requirements, it is possible for the meta-model to fully reveal how the BM interacts with nature and society. Existing BM meta-models certainly serve their specific purposes, but none of them is able to meet both requirements simultaneously, and are therefore considered insufficient to display the increased complexity (Antikainen & Valkokari, 2016; Cosenz & Noto, 2018; Lewandowski, 2016; Sparviero, 2019).

2.5. CLDs: benefits & deficiencies

By exploring the literature, this research encountered the CLD, as the tool able to meet both these requirements simultaneously. CLDs allow for the visualisation of causal structures, including feedback loops, both within a BM and between a BM and its internal and external environment and provide space for the integration of mutual value creation along the triple bottom line (Kiani, et al., 2009; Kim, 1999; Sarmiento, et al., 2020). Moreover, CLDs have the possibility to uncover an effective leverage point in the BM to reduce negative impact or create more positive impact (Kim, 1999; Sahin, et al., 2020). They are not unique in the fact that they allow for the integration of causal structures, the inclusion of all targeted and non-targeted stakeholders, or the inclusion of all of an organisation's externalities, but they are unique for integrating all these features within one representation. CLDs are not a new tool, as their concept was first mentioned by Foster in 1961, however, they have been

primarily used for systems mapping and not for the formal conceptualization of BMs (Haraldsson, 2000). Nevertheless, one great example of a CLD describing a BM is found in a 2020 study by Sarmiento and colleagues. They visualize the working and the impact of a cable car system in the city of Bogotá, Colombia. Their final CLD is presented in Figure 5. No other BM meta-modelling tool is found that can provide the unique combination of information a CLD is able to reveal.

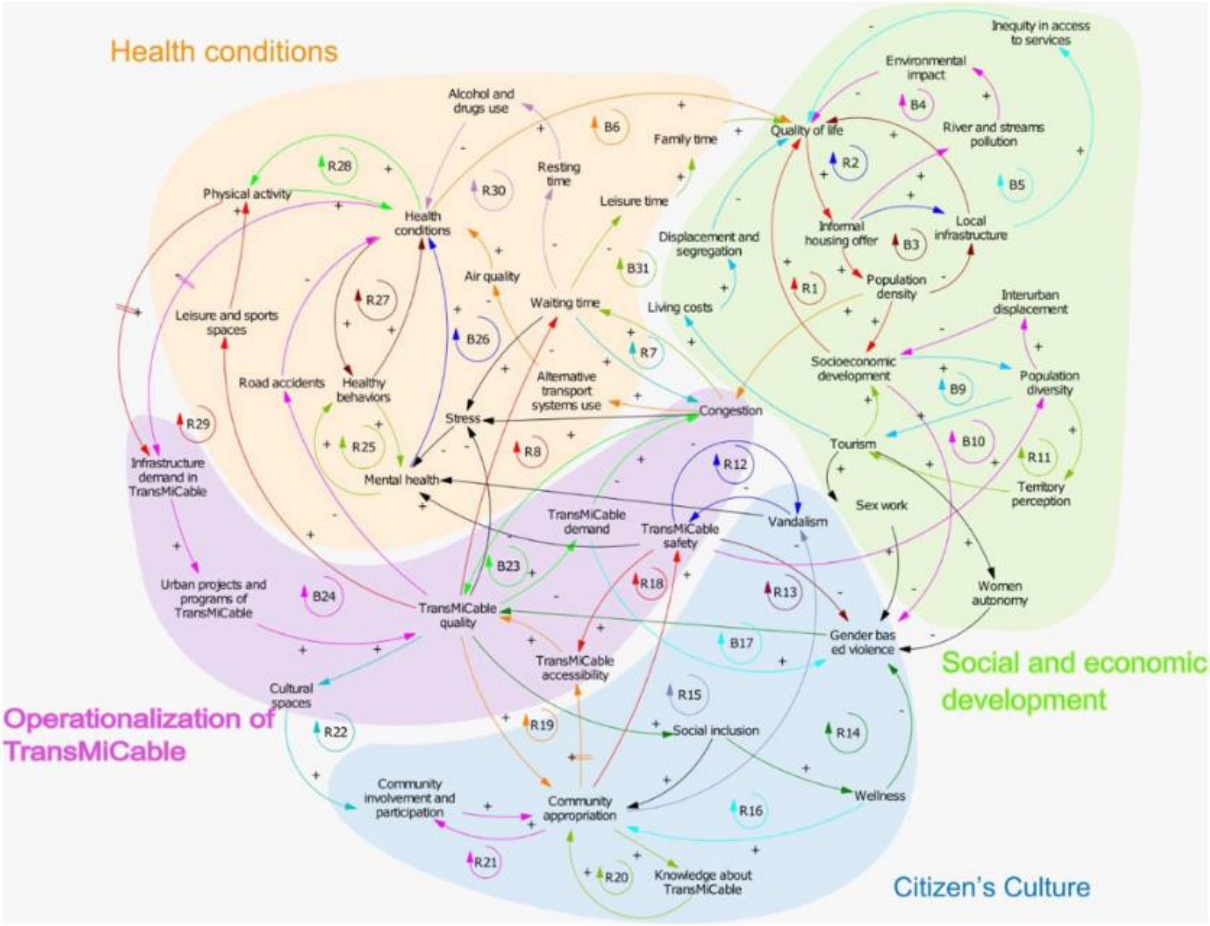

Figure 5: Impact of a cable car system in the city of Bogotá, Colombia (Sarmiento, et al., 2020)

Despite its advantages, some downsides of the CLD also require serious attention. As pointed out, one of the two primary purposes of BM meta-models is to simplify the complexity of BMs to make them understandable or comprehensible for our cognitive capacity (Burton & Obel, 1995; Massa, et al., 2017; Osterwalder, et al., 2005; ...) However, compared to the other meta-models of section 2.3. of this research, CLDs miss specific features that simplify a BM. The CLD, for example, is not divided into separate modules, increasing the difficulty to uncover the key activities, key stakeholders, key resources, … of the BM (Cornforth & Green, 2008; Raith, et al., 2021). It also does not provide a standardized template making it harder for stakeholders to interpret the model (Klang, et al., 2014). Moreover, the CLD provides little space for text, leaving out important information, such as quantitative information on costs and benefits or information related to business governance (Flourishing Enterprise Co-lab, 2022; Osterwalder & Pigneur, 2010). Overall, it is fair to say that the CLD

fails to simplify a BM to an acceptable level and that it lacks important information about the BM compared to the other BM meta-models, because of its strong focus on how a BM affect the socio-ecological system, and, thus, should not be seen as the ideal formal conceptual BM representation.

Illustrated by the previous paragraph is the fundamental tension that exists between the two primary, but actually opposing, purposes of BM meta-models. Comprehensiveness and comprehensibility can occur at the expense of one another. On the one hand, increasing comprehensibility can involve abstracting elements, relationships and information till the point where important information gets lost in the model. On the other hand, enhancing comprehensiveness can lead to the inclusion of extra components and information, making the model complex, and therefore confusing and incomprehensible. It is important that any BM meta-model finds the right balance between comprehensibility and comprehensiveness. Only when a BM succeeds in this, it can be considered as successful.

3. Methodology

To uncover how businesses can restore disrupted levels of comprehensibility and comprehensiveness in BM meta-models, stemming from the growing importance of BM's impact on socio-ecological systems, a clear and comprehensive methodology is followed, outlined below. While the research question could be investigated using different categories of BMs, this study focuses, in particular, on the NBS category. NBSs are centred around their impact on socio-ecological systems, making them together with their multi-stakeholder collaboration requirements utmost suitable for this research (Cohen-Shacham, et al., 2016; Dudley, et al., 2021; Mayor, et al., 2021). In order to justify the decisions made in this qualitative research design, there is first elaborated upon how this study frames into the work of the BWLs collective, the partner organisation of this research (3.1). After this section, the research design is discussed, with specific attention towards the data collection and data analysis (3.2).

3.1. Partnership Rotterdam School of Management with BWLs collective

This study is one of six partial results of a partnership between the BWLs collective and the Erasmus University Rotterdam, School of Management. The BWLs collective, managed by Ashoka, Commonland and Presencing Institute consists of 25+ international system-changing organisations. Their mission is to create 10 strong leadership communities - BWLs - by 2030 that mobilise 1 million changemakers to protect, restore and regenerate 1 million hectares of Europe's land and sea. To realise their mission, the BWLs collective follows a strategy consisting of six pathways: (1) creating weaving labs; (2) building a learning network; (3) scaling system innovation; (4) activation of changemakers; (5) financing systems change; and (6) policy influencing (BWLs collective, personal communication, March 2023). The different pathways are briefly summarized in Appendix A.

In the assistance of the BWLs collective further developing strategy pathways 3 and 5 and realise their mission more efficiently and effectively, six students of the Rotterdam School of Management, program 'Global Business & Sustainability', wrote their Master's thesis in favour of the collective. Appendix B provides an overview of the student's research questions. After finishing all individual studies a brochure will be created, synthesizing all findings.

This specific research is focused on strategy pathway 3 'scaling system innovation'. In the process of scaling positive social change, the BWLs collective mainly focuses on NBSs and engages, amongst others, in weaving practices to map systemic needs in a bioregion and consequently select and implement NBSs to bring positive impact down on the region. The BWLs collective also developed a portfolio of systemic innovations, a term referring to NBSs, to provide guidance on the process and indirectly add value to a bioregion (BWLs collective, personal communication, March 2023).

In the process of implementing and scaling NBSs, the BWLs collective identifies three crucial actors that are required to collaborate, namely, (1) social entrepreneurs, who create specific NBSs; (2) social investors, who bridge the fundamental finance gap that exists for NBSs (Müller, et al., 2022); and (3) weavers, who function as field workers in bioregions and connect people, cultivate meaningful relationships, and foster collaboration to scale NBSs (Hussain, et al., 2022). Hussain et al. (2022) identified five weaving practices; helping systems see and sense themselves, cultivating trust-based relationships, aligning on a shared purpose; facilitating collective (un)learning; and fostering experimental action. For a detailed explanation of each practice, I refer to that study. In between these three parties exists a lot of knowledge and information exchange, centred around the working of NBSs, for which BM meta-models can be used. Social entrepreneurs will, for example, try to convince social investors to provide funding for their NBS by presenting their innovation, while weavers need to have an adequate understanding of different NBSs to fulfil their role and contribute to the creation of positive social change. Despite the importance of information and knowledge exchanges between these stakeholders, the study by Hussain and colleagues, conducted in 2022, pointed out that lack of collaboration still functions as one of seven barriers to scale NBSs, primarily because of differences in institutional logics between the collaborating parties, causing, amongst others, differences in operating languages and time frames. It was proved, amongst others, that information and knowledge exchanges do not occur as seamlessly as expected, on the contrary, the study even proposes adequate knowledge-sharing systems as one of nine fundamental enablers to scale NBSs. Consequently, to be of help to the BWLs collective, this research aims to find out how BM meta-models can become an important enabler for NBSs by bridging institutional differences between stakeholders.

3.2. Research design

This research takes on a qualitative study design and executes semi-structured interviews to achieve its objectives. Its specific interest in how BM meta-models can display the holistic systems' perspective of BMs while keeping complexity low, and the focus on BM meta-model practitioners' experiences using different BM meta-models, advocate a qualitative research design, rather than a quantitative one (Cooper & Schindler, 2014). To get an in-depth understanding of the topic and gain robust results that can be generalised to at least some extent a multiple case study design is preferred on top of a single case study design (Gustafsson, 2017). Different stakeholders working on NBSs need to be interviewed to collect different interpretations and viewpoints on the use of BM meta-models, only then the objectives of this study can be achieved.

Regarding epistemology, this research is oriented by constructivism and is aligned with Sharan Merriam's accompanying principles of knowledge production and meaning-making. According to constructivism, "the primary interest of qualitative researchers is to understand the meaning or

knowledge constructed by people" (Yazan, 2015, p. 137). In other words, it is the task of the researcher to actively construct the gathered knowledge. Although Merrian emphasizes the importance of data collection and analysis being a simultaneous process, both processes are segregated in this final paper to explain this study's research design clearly (Merrian, 2009).

3.2.1. Data collection

3.2.1.1. Interview respondent selection

Interview respondents were selected via the network of the BWLs collective, using purposive sampling (Blumberg, et al., 2014). First, the criteria of heterogeneity was applied to secure the presence of actors out of different stakeholder categories in the interview sample. Next, by applying different criteria, multiple cases in each stakeholder category were selected. In total, 10 respondents were interviewed, of which three weavers, four social investors, and three social entrepreneurs. It is explained now how and by using which criteria, specific interview candidates were selected within each stakeholder category.

The first stakeholder category is the category of weavers. In their mission to create 10 BWLs by 2030, the BWLs collective has already established four bioregions in 2022 (Åre, Sweden; Oltenia de sub-Munte, Romania; Altiplano Estepario, Spain; and Waterford, Ireland) and launched three others in the same year (Brandenburg, Germany; Adour-Garonne Basin, France; and Thermenlinie, Austria). For one other bioregion (Zuidelijke Zandgronden, The Netherlands) the weaving team is now selected and that bioregion will launch in 2023. The two last bioregions still have to be selected. To select the weavers for the interviews, candidates were chosen out of the already launched and established bioregions. Out of these seven regions the following three candidates were chosen: Weaver 1 involved in Åre, Sweden; Weaver 2 involved in Waterford, Ireland; and Weaver 3 involved in Thermenlinie, Austria.

Next, to select interview candidates in the social investor category, social investors needed to be already familiar with the work of the BWLs collective, indicated as 'supporting organisations', so that they understood concepts such as weaving and NBSs. Within the spectrum of the social investor, there exist a lot of different categories in some of which the BWLs collective had supporting organisations already, but not in all of them. In the following categories, the BWLs collective had supporting organisations, how many is indicated by the number between brackets: traditional philanthropists (2); private foundations stemming from a family, an organisation, or a group of individuals (6); impact investors (3); private equity investors (2); …. In other categories, such as angel investors or venture capital Investors, the BWLs collective has no supporting organisations. Consequently, candidates were derived from the first four categories. Respecting the distribution of supporting organisations along the categories, a total of four interview participants were selected, two funders working for a private foundation, one impact investor, and one private equity investor.

In the final stakeholder category, the candidates were the social entrepreneurs whose NBS is part of the systemic innovations portfolio, the BWLs collective is currently developing. Initially, this portfolio consisted of 36 systemic innovations. Four criteria were applied for participant selection, only entrepreneurs meeting all four criteria remained in the race for case study selection. The specific criteria were chosen to ensure sufficient data was available to prepare the interview and already have insight into a participant's own NBS's BM prior to the interview (C1 ⇒ C3), and to ensure the case was relevant to this study's objective (C4). It concerns the following four criteria:

C1. Archival data on an entrepreneur's NBS is available in the BWLs collective's bid book (January 2021).
C2. An archival interview is available with the entrepreneur.
C3. The entrepreneur behind the NBS can be approached in either Dutch or English.
C4. In the bid book, funding/investment is specifically mentioned as a challenge in scaling impact for the entrepreneur's NBS.

After the application of these four criteria, the entrepreneurs of eight systemic innovations remained for potential selection, See Appendix B. Out of these eight systemic innovations, a sample of three NBSs was selected. Initially, the goal was to select three NBSs belonging to the same NBS category, to avoid too many inter-case differences, however, this was no longer possible, since only eight NBSs remained. Therefore three entrepreneurs were selected out of this sample of which the NBS mainly created positive environmental impact, rather than societal impact to keep the inter-case difference as limited as possible. The following three NBSs were chosen, of which the social entrepreneur behind the innovation was contacted.

Table 2: Selected NBSs: Locations and brief descriptions

	Location	NBS category	Brief description
1. Bioregional	United Kingdom	Weaving & Integration	Providing a framework and a process, that enables companies, communities, and city-regions to create a world where people enjoy happy, healthy lives within the natural limits of the planet, leaving space for wildlife and wilderness.
2. Grow it Yourself (GIY)	Ireland	Community farming	Inspiring and enabling a global movement of people who grow their own food at home or in the community to reconnect with nature.
3. Hoge Kempen National Park	Belgium	Nature conservation	Providing a (Re)Connection model for natural ecosystems, increasing socio-economic benefits through eco-tourism while also protecting the environment.

Bioregional was in the end not available for an interview, which got them replaced by Soil Capital. Soil Capital is a Belgian organisation, which developed a carbon payment program. Its entire case got prepared, but also they turned out to be unavailable for an interview in the end.

A solution had to be developed to bring enough entrepreneurial insights into the dataset. One weaver was found to have an entrepreneurial background and provided insights on the interview matter through an entrepreneurial lens, on top of his/her weaver's lens. Moreover, to strengthen the findings and create more robust results, this study also relied on the interviews of the colleague students of

the Rotterdam School of Management involved in the partnership with the BWLs collective. A total of 58 interviews were conducted, of which an overview is provided in Appendix C. Each interview received a unique number. This study extended its data set with interviews 30 and 31. Finally, a respondent validation interview was performed with respondent 41 in which the results of this study were presented and discussed to enhance the methodological strength of this research.

3.2.1.2. Interview manuals

To allow the respondents to share their own viewpoints and experiences using CLDs and other BM meta-modelling tools, semi-structured interview manuals were compiled (Blumberg, et al., 2014). Three different interview manuals were created at the beginning of the data collection and further developed throughout the collection process based on the initial stages of data analysis, one for social entrepreneurs, one for weavers and one for social investors. The manuals are added in respectively Appendix E, F, and G.

As recommended by Blumberg et al. (2014), section 1 of each interview manual is deliberately kept more exploratory and aims to assess an interviewee's exact function and need to communicate or to obtain information from other stakeholders around specific NBSs. Section 2, is then a more formal part aimed at collecting information on what BM meta-models can be used to communicate the increasing complexity of sustainable BMs. To fathom BM meta-models, this research applies two concepts of distinct literature streams. On the one hand, the CLD originating in the system thinking literature and, on the other hand, the FBC stemming from the management literature. This approach of drawing on different theoretical lenses to build theory in the management literature is legitimized by Okhuysen & Bonardi (2011). Consequently, for the purposes of section 2, and to dig deeper into what an ideal meta-model should look like, the FBC v2.1 and the CLD were filled out for the NBS of GIY, Ireland, using an inductive approach. 'Inductive' refers to "elicited and derived from textual materials, such as interviews with managers and entrepreneurs, official communications with stakeholders, and other documents describing firms' BMs" (Furnari S., 2015, p. 21). The specific sources from which information was derived are the following:

- Archival interview with the NBS's social entrepreneur – Confidential
- Discussion of the NBS in the BWLs collective's bid book (Jan 2021) - Confidential
- Discussion of the NBS in the Annex of the BWLs collective's insights report – Public available
- Information available on the NBS's website – Public available

Taking all sources together, firstly, the FBC could be filled out to a large extent. Moreover, the goal was not to fill out the canvas 100% correctly but to do so as accurately as possible to give the interview candidates a good idea of what the canvas would look like for a specific NBS. As an illustration, the FBC filled out for GIY in Ireland is mapped in Figure 6.

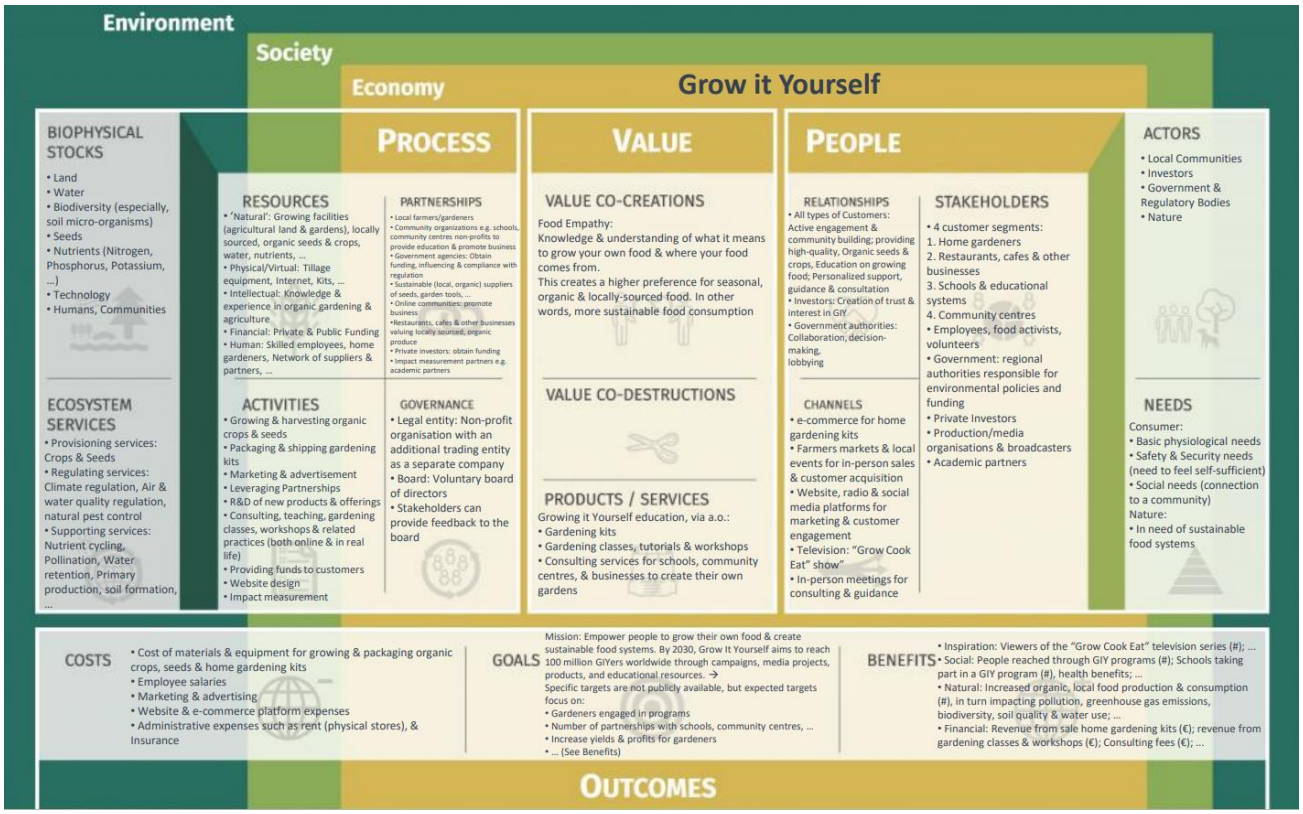

Figure 6: Flourishing Business Canvas - Grow it Yourself, Ireland

Next, the CLD for GIY was mapped with the help of the online platform KUMU. Paying attention to how the different building blocks are interrelated the CLD could be created efficiently. Specific attention was, for example, paid towards sentence structures in the above-mentioned sources of information, indicating causal structures, e.g. "As a result of GIY programs, participants are three to four times more likely to live on a plant-based diet than the average person" (Warhurst, et al., 2021, p. 6); "By raising awareness to the bigger picture and the impacts of the current food system, the initiative imbues people with a deeper consciousness of the food chain and related environmental problems, and consequently enables a change in attitudes and behaviours essential in promoting sustainable food alternatives" (Müller, et al., 2022, p. 116). Mapping the NBS first into the FBC avoided missing important content of the NBS in the CLD. As an illustration, the CLD of GIY, Ireland is mapped in Figure 7.

The interviews lasted on average around 45 min, with the shortest interview lasting 35 minutes and 1 second and the longest interview lasting 53 minutes and 46 seconds. All interviews were transcribed in between two days after the interview took place. Note that this only applies to the interviews conducted for this specific study.

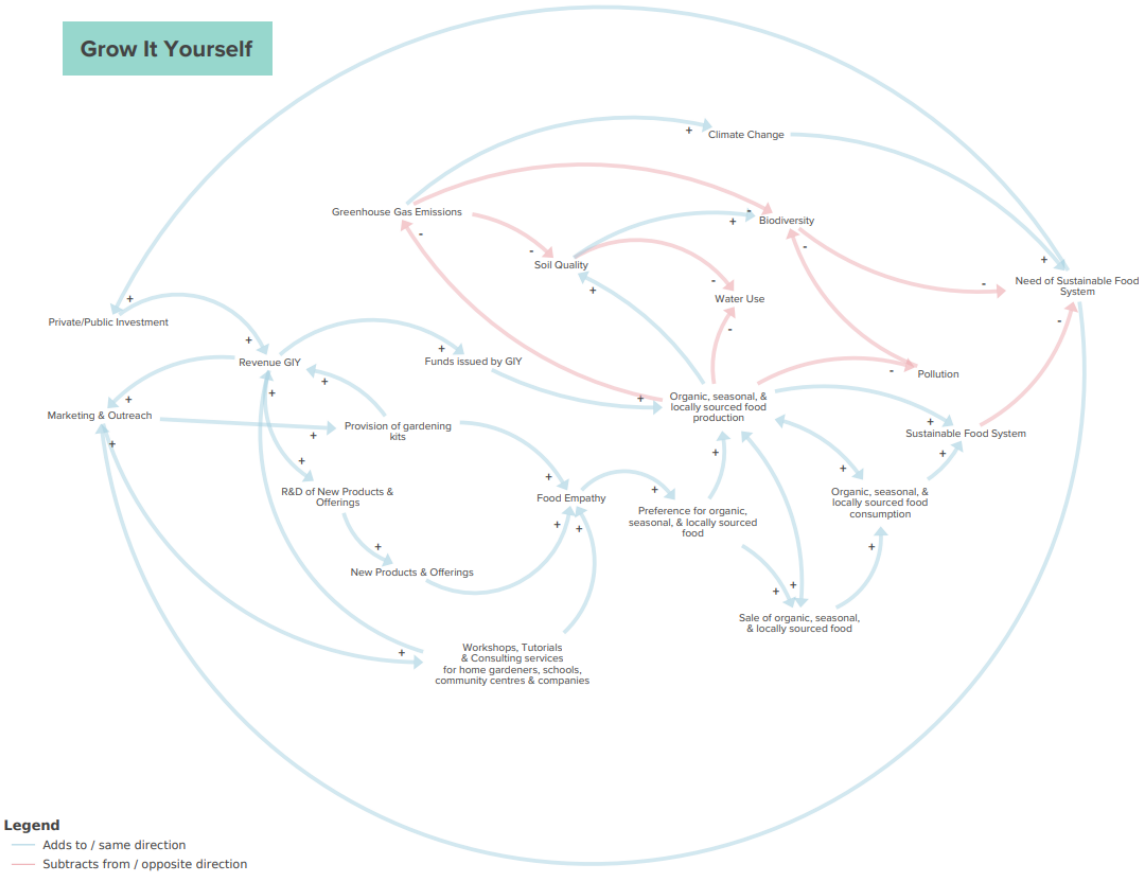

Figure 7: Causal Loop Diagram - Grow it Yourself, Ireland

3.2.1. Data analysis

According to Stake (1995), "Each researcher needs, through experience and reflection, to find the form of analysis that works for him or her" (p.77). However, Yazan (2015) indicated that new researchers will need guidance from other more experienced researchers, preferably experts, on how to pursue the data analysis phase, since they did not gain experience yet. Moreover, this paper highlights that constructivism is more accessible to new researchers than positivism as constructed by, for example, Robert K. Yin or Kathleen M. Eisenhardt. Consequently, this research follows the principles of constructivism as outlined by Sharan Merrian (2009).

Oriented by constructivism, data collection and analysis were to a certain extent pursued simultaneously in this study. The researcher has to construct new knowledge him/herself, but "the researcher usually does not know ahead of time every person who might be interviewed, all the questions that might be asked, or where to look next unless data are analysed as they are being collected" (Merrian, 2009, p. 169). Starting the initial stages of data analysis by making notes during interviews and thereafter during transcription, allowed, amongst others, to adapt interview manuals and ask additional questions related to topics originally not considered as important or to simply

restructure questions more clearly. All this was essential to be able to finally achieve new theoretical contributions.

After all the data was gathered a more incentive stage of data analysis started to substantiate, revise and reconfigure the findings that existed up until then (Merrian, 2009). For this stage, Merrian builds on the principles of the basic inductive and comparative analysis method founded by Glaser & Strauss (1967). With the use of the software tool Atlas.ti9, the first four interview transcripts were coded, resulting in 92 first-order codes. From the beginning, it was a clear goal of this research to indicate what BM building blocks were necessary to display a BM's impact on socio-ecological systems, and what BM meta-models these building blocks could present. Consequently, these 92 codes included, amongst others, 10 codes describing important BM features. Moreover, many codes discussed the advantages and disadvantages of the FBC and the CLD (e.g. 'FBC has no redundant info'; 'FBC can give a nice one pager'; CLD useful for creators), as there was the belief at first that one universally comprehensible BM meta-model tool could be found or created capable of providing all relevant aspects of BMs, including a BM's impact on socio-ecological systems. However, it was the combination of different opinions in the first four interviews on the utility of BM meta-models, and the distributed preference in the FBC, CLD, and other meta-models, that led to the conclusion that this was not possible. Rather BMs should be adapted to their aim and to the recipient to make them comprehensive and comprehensible. The following four quotes illustrate the difference in opinions that existed:

"And positive feedbacks and negative feedback loops and everything that is more valuable because. Let's put this way again, especially in our case. But I know in many, many cases what you do is creating and running a solid business that has a very solid system-changing perspective, which is what social entrepreneurship is sometimes about right or most of the times, and that means, let's say double, maybe quadruple harder than running an association, and it is quadruple harder than running a business." *(Respondent 40)*

(On the CLD): "Personally I don't have a huge affinity with it. That doesn't do much for me. I think it's too much, arrows here and there and doesn't really help me personally, but I know that for service designers it's a very useful tool. I know lots of people you know that, especially ones that have been educated and through a sort of service design masters course or something it's their go-to tool and I know therefore that there's a common language happening and where people relate to causal loop diagrams." *(Respondent 41)*

"The loop diagram is possibly less than the business canvas, because the business canvas, really explains your core values, your people, your process and so on, whereas, in my opinion, the mind map, the loop diagram, is more an informal brainstorming. As an investor, I would think the business canvas gives a nice one-pager on your business. It's still simple and it really defines it very clearly." *(Respondent 42)*

"I mean we spent a lot of time as an organization developing a theory of change and I think it was an extremely helpful process for us to sort of figure out exactly what, you know, the kind of outcomes that we want and, you know, like just get real clarity on what we're about. (…) It would usually be included in the appendix of a pitch deck and so like and I guess it does depend a little bit on the funder. There are some funders that maybe we would expect to see a theory of change and so and some I think would just I think the rise would glaze over while you're presenting it, so I'd be sceptical about." *(Respondent 43)*

Consequently, many of the 92 first-order codes were already capturing these stakeholder-specific needs and interests in BM meta-models (e.g. 'Weaver needs to understand bioregion'; 'Investor

assesses impact creation'; Social entrepreneur needs long-term capital') and focused on assessing interindividual differences (e.g. 'BMMM-Visual-Needs to be familiar'; BMMM-Visual-Simple in eyes of recipient). Refining the first-order codes, with this in mind, reduced the number of open codes to 39 at first and generated 14 second-order codes. The data was revisited again after further interviews were performed and the number of open codes was extended again to 49. Based on these codes a final iteration was developed, resulting in 18 first-order codes, six second-order codes and three aggregate dimensions. The final conversions were based on smaller insights to make a coherent whole of the data structure. The final data structure is presented in Figure 8.

3.3. Ethical considerations

In respect of ethical conduct and practices, all interview participants were provided with and asked to sign an information and consent form after they participated in the interview. The form informed them of their rights as interviews, and what would happen with their personal and interview data in the further development of this research. The information and consent form is added in Appendix F. Despite this form covering all ethics-related themes, one specific topic requires extra explanation. Regarding the social entrepreneurs interviewed in this study, it is possible to find out online, who the entrepreneur behind a specific NBS is. Since the NBSs are mentioned by name in the study, the entrepreneurs' anonymity cannot be guaranteed. To deal with this issue, this matter was outlined to the respective entrepreneurs, and they were informed that they would be referred to as 'the entrepreneur behind a specific NBS' at the time of signing the information and consent form.

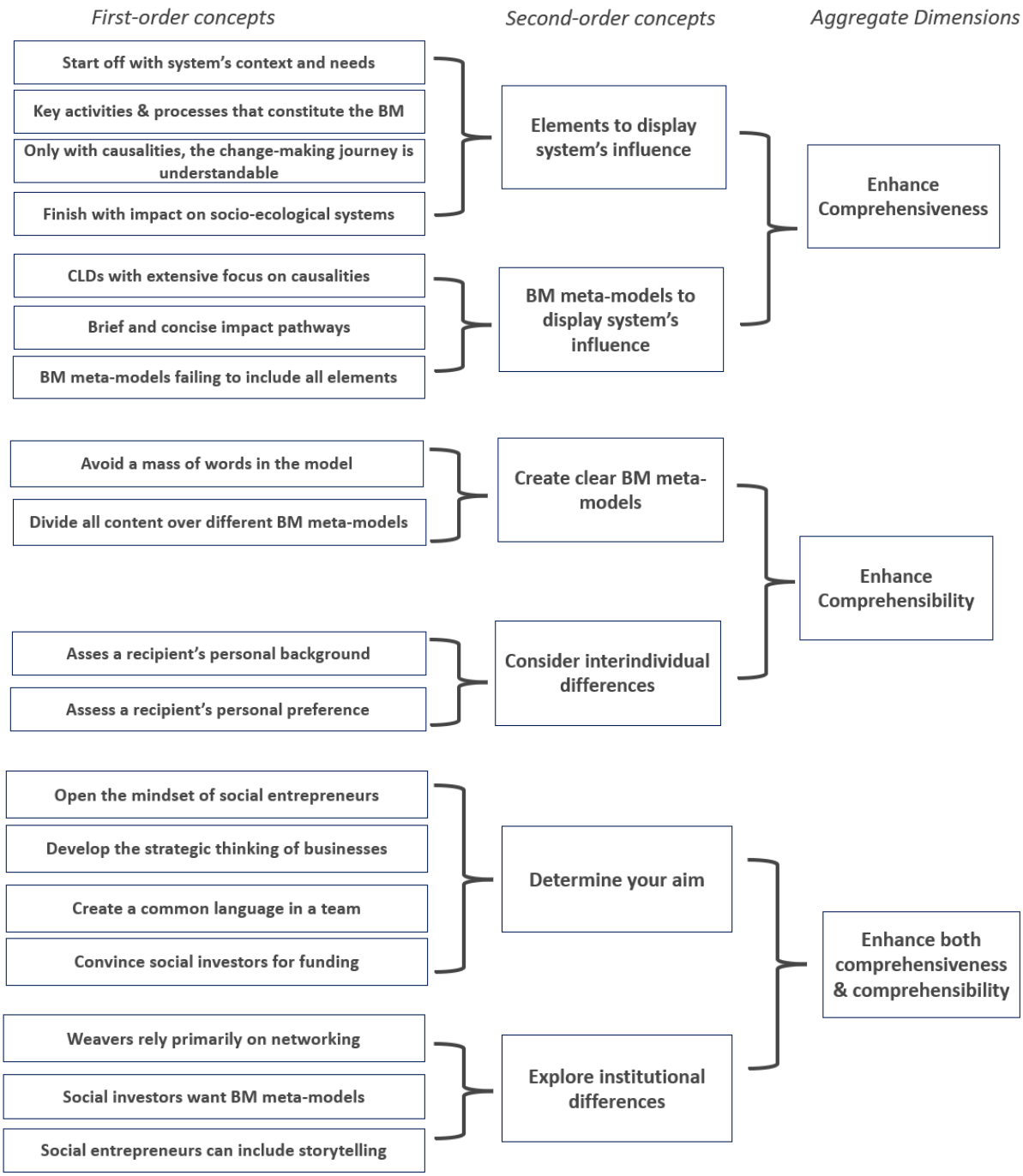

Figure 8: Overview of final data analysis codes

4. Results

Throughout the interviews, different means have been identified to enhance the comprehensiveness and comprehensibility of BM meta-models, some of which improve only one of the two constructs, and others that affect both. What are now all relevant aspects that need to be included in a BM meta-model? And what can be done to make a BM meta-model that has simplified the complexity of a BM by taking advantage of its traits of standardization and modularity and by using different multivocal symbols, actually comprehensible for a recipient? As amplified by *Respondent 45*, the need for answers to these questions is high:

"I've encountered so many models that mostly confuse me. And they are doing kind of a bad job communicating ideas that might be the best idea I've ever heard of. But if I view them via these weird and overwhelming models and diagrams, then my first impression will be a negative one, and then this may be the best idea I've ever heard will have this negative bias, and then I won't view it as the best that you have ever heard, but just some annoying idea. So, I really encountered many of these diagrams, and some of them are really good, some of them are pretty good, but some of them really, really suck." (Respondent 45)

The findings are described in this section. Although interview quotes are extensively used in this description, Appendix I provides an overview of two quotes per first-order code to further substantiate the findings.

4.1. Enhancing comprehensiveness

4.1.1. Elements to display system's influence

Communicating how a BM affects socio-ecological systems involves the explanation of four distinct elements to shape the complete storyline. First of all, it is always necessary to start from the fundamental socio-ecological need the BM tries to address *(Respondents 03, 26, 30, 31, 40, 41, 42)*. What is the exact issue that the BM attempts to tackle, and what is the context in which the BM is shaped? "If you do not understand that context, you cannot understand the decisions that are being made through that." *(Respondent 30)*. The addressed need is also an important indicator of why what you are doing is so brilliant *(Respondent 03)*. In the case of NBSs, this includes an explanation of the region in which positive social change is scaled. Such an explanation can include an overview of the resources (physical, financial, social, …) available in the region *(Respondent 40)*. As an example of what information is referred to, the following paragraph quotes how *Respondent 41* described his/her bioregion:

"It is one of the biggest exporters of meat and dairy in the world, and it supplies the meat from McDonald's across Europe. It supplies the milk powder for huge parts of China, massive export. And through this, it has become an area where extractive and industrial agricultural processes dominate. At the same time, it is an area of extreme beauty and natural resources and you just see this sort of this tension between this natural landscape and what

they're doing to it. And that's expressed both in soils and water. But also I think very much in people's identity and health, mental health and physical health." (Respondent 41)

Secondly, one needs to include the impact that has resulted from the BM on the socio-ecological system *(Respondent 03, 26, 40, 41, 42, 43, 44, 46)*. As indicated by *Respondent 42*: "The most important thing for [name organisation] as a not-for-profit organization is to see what impact a certain solution will bring to a society." What social, environmental, and financial value has been created, or destructed, by the BM? Depending on the stage of development of a business, this information might not be available yet, however, in that case, the projected impact should always be communicated *(Respondent 03, 26)*. "This is what we expect to happen, this is what the return will be, this is how many people we think we will help." *(Respondent 03)*. Careful attention should be paid to the difference between outputs, outcomes, and impact when communicating impact on socio-ecological systems. As indicated by *Respondent 42*: "What is important to me is not the output, but the result of the output. You can, for example, say okay, if we help cocoa farmers in Ghana, it is very nice if you can reach, let's say, 100,000 cocoa farmers, but I find it more interesting to know 'How have their living conditions improved?', …, or 'How has the crop improved because of the input you have given?'".

Thirdly, the key activities and processes which constitute the BM and are ultimately causing the positive or negative impact on socio-ecological systems need to be communicated *(Respondent 03, 26, 40, 42, 43, 46)*. A recipient must understand the way an issue is tackled or caused, and to do so, the activities and processes that stand in place need to be expressed. As amplified by *Respondent 40*, limited depth can suffice here: "And then these are my potential main strategies as we call them forms of production, to go towards our vision, like, not in detail, like work with this guy or do that, but more like, yeah, let's say, make sure to have an entrepreneurial system in place for involvement of people".

However, in order to explain the complete plan, the overall solution, a fourth and final element needs to be included in the communication of a BM's impact on socio-ecological systems, namely the causal relations that are present in the model *(Respondent 03, 26, 40, 41, 43, 44 45, 46)*. How do different activities and processes follow up on each other and how will this finally lead to an overall impact? Excluding causalities can suffice in case of low-level complexity systems, but not in a high-level complexity system, such as a change-making journey as stated by *Respondent 40* when criticizing the FBC:

What I would like to say is that most of the business management. Most of it, not the whole, but most of it is designed for low-level complexity entities. For instance, a for-profit company that produced this or that product. That is a, you know, a product or a service is low complex. I'm not saying that it is not complex and everything is easy. No, I'm not saying it's easy. It's hard, whatever. But it is low-level complexity. The number of holistic dimensions you have to manage is rather lower. So and those diagrams, especially the Flourishing Business Canvas, are designed for managing relatively low complex levels, so I will say it's not missing anything. It's just designed for that and it does its work pretty OK, but it's not applicable or as helpful when it comes to higher-level complexity situations which again a social enterprise usually is or a change-making journey is (Respondent 40).

Only when including causal structures it will be possible for the recipient to understand what the change-making journey consists of. Both positive and negative relationships, as well as feedback and feedforward loops, can be taken into account here. Moreover, *respondent 45*, indicated the importance of expressing neutral relationships in the BM, and also the magnitudes of the effect of causal relations.

4.1.2. BM meta-models to display system's influence

Respondents have indicated the prevalence of different BM meta-models they use or encounter with the purpose of simplifying a BM's impact on socio-ecological systems. Firstly, three interview respondents acknowledged the possibility to simplify and communicate a BM's impact on socio-ecological systems with CLDs *(Respondents 40, 41, 45)*. The most important feature of a CLD is that it extensively displays the causal relationships between the BM building blocks, explaining how the BM influences the socio-ecological need and finally comes to an impact.

Secondly, a theory of change (ToC) framework representing an impact pathway can be of value *(Respondent 41, 43)*. "We spent a lot of time as an organization developing a ToC and I think it was an extremely helpful process for us to sort of figure out exactly what the kind of outcomes that we want and, like, just get real clarity on what we're about" *(Respondent 43)*. An example of a ToC framework is represented in Figure 9, representing the change-making journey of GIY. ToC frameworks display all four elements necessary to communicate BM's impact on socio-ecological systems very briefly and well-organised. This is their main advantage but at the same time their biggest disadvantage. Compared to the CLD, a ToC framework presents less information and only sets out the big lines of the change-making journey. When comparing the ToC framework of GIY in Figure 9 with their CLD in Figure 7, it becomes clear, amongst others, that CLDs can include more of GIY's activities and processes, including natural processes in ecosystems. Moreover, while focusing on the causal structures no positive or negative relations are considered in the ToC framework, and neither are feedback and -forward loops. Note that both BM meta-models leave only little space for impact measurement metrics.

Figure 9: Theory of Change Framework - Grow it Yourself (Respondent 43)

Thirdly, many BM meta-models are used or encountered in practice which have the purpose of communicating how a BM affects socio-ecological systems, but do not provide all four elements, identified here as required to provide the whole image. The BM meta-model, belonging to this category, most often encountered is the BMC, or one of its derivatives *(Respondent 40, 41, 42, 45)*. These business canvases exclude causal relationships and are therefore no systems change tool. "You know, the business canvas one, it's not for systems change, it's for the symptoms change and how to keep your business going. But it's not a systems change tool" *(Respondent 41)*. Next, independent measurement scorecards are sometimes used with the single goal of explaining the outputs, outcomes and impact of BMs *(Respondent 41, 42, 44)*. Finally, one interviewee indicated the use of the Iceberg metaphor/model to explain how a BM creates systemic impact *(Respondent 43)*. The issue with this latter framework is that it is abstract and misses specific information about the BM.

4.2. Enhancing comprehensibility

4.2.1. Create clear BM meta-models

In order to create clear BM meta-models two means have been derived from respondents' answers. Firstly, four respondents touched upon the topic of overwhelm by information *(Respondent 41, 42, 45, 46)*. Although no consensus existed over when a BM meta-model provides an overload of content, it became clear that any respondent can be overwhelmed by an overload of information at some point, and that it should be avoided at all times. As an example, two respondents indicated they experienced the FBC, filled out for the NBS of Grow it Yourself, as presented in Figure 6, as too complex *(Respondent 41,45)*. "It's not the redundancy that strikes me, it's, the mass of words. It's this load of information that strikes me, but I don't. I don't feel like it's redundant. I just feel like it's a bit too much, maybe." *(Respondent 45)*. Then again, one respondent declared having no problem with the amount of

information in the model. “No, I like it. You know, because it's very concrete. There's no overload, in my opinion.” *(Respondent 42)*.

Secondly, two respondents indicated that multiple BM meta-models can be used simultaneously for whatever purpose *(Respondent 26, 41)*. The transferred content is in such cases divided over the different models. On a question of whether to include causal structures in a pitch for a social investor, *respondent 41* asked spontaneously whether she had to choose between different BM meta-models or if she could use more than one. Moreover, *respondent 26* indicated his/her organisation does not always stick to one and the same BM meta-model during an investor pitch. “It's not necessarily saying that we only go for one BM in our application and our funding scope.” *(Respondent 26)*.

4.2.2. Consider interindividual differences

Additionally, respondents have indicated the need to explore interindividual differences and assess recipients’ differences in personal background and preferences to create a more comprehensible BM meta-model. It is important to clarify that this applies to discovering differences in personal background and preferences of individuals belonging to the same institution, i.e. stakeholder group. Exploring interinstitutional differences is discussed in section 4.3.2. of this research.

First of all, the personal background of the recipient plays an important role to determine whether the meta-model will be perceived as familiar, and therefore comprehensible or not *(Respondent 26, 41)*. A recipient’s educational background plays an important role here. "I think it's too much, arrows here and there and that doesn't really help me personally, but I know that for service designers it's a very useful tool. I know lots of people you know that, especially ones that have been educated and through a sort of service design masters course or something it's their go-to tool" *(Respondent 41)*. However, it is also important to find out where recipients position themselves. For example, in the case of a social investor as the recipient, determine whether the investor is an impact-driven investor or a grant funder *(Respondent 26)*. In the case of an impact-driven investor, it becomes much more important to focus strongly on metrics with the BM meta-model.

Secondly, the recipient’s personal preference must be assessed *(Respondent 41, 42, 43, 45)*. Assessing someone’s personal preference is difficult, and it’s primarily something that can only be found out by building relationships and gaining experience as illustrated by the following two quotes:

“I know there's a big investor here, for example, an impact investor, who loves a social business canvas. (…) they like a business canvas for anything that they're going to invest in. So, if I suppose I was going to show them an investable portfolio of things. I could show a very, very simplified business canvas for each of the portfolios that we have in our bioregion because I know that that particular investor likes a business canvas” (Respondent 41)

“I was working on a pitch this morning to a particular foundation that's very, focused around carbon measurement and so we'd be speaking to the carbon-saving potential of food growing overtime with that funder. Another funder might be more interested in the health metrics, you know, the positive impact on mental health

over time. So I think often when you're looking for funding, it's about adapting your metrics to sort of not exactly to suit the funder, but certainly to suit the pitch" (Respondent 43)

4.3. Enhancing both comprehensiveness and comprehensibility

4.3.1. Determine your aim

Interview respondents have indicated the use of BM meta-models for four different purposes, some of which are overlapping. Firstly, they can be used to develop entrepreneurs' understanding of their BM at the beginning of their entrepreneurial journey *(Respondent 26, 40, 41, 42)*. "If you are in the relatively beginning journey of your entrepreneurship or system changing and everything, then they really help for you to see what your assumptions and what your thinking is or how basically limited it may be and things like that. So, to clarify, to open up your mind" *(Respondent 40)*. Secondly, meta-models can be used to facilitate an organisation's continuous strategic thinking *(Respondent 26, 40, 41, 42, 43)*. It is a place to focus your attention as a team and to go into detail on the BM to discuss how to keep developing the business every single day. Thirdly, a common language can be facilitated by BM meta-models between people with different backgrounds and skills *(Respondent 40, 41, 45)*. "When there is an asymmetry, of, let's say experience within the team or between the stakeholders, it doesn't have to be in the team, right, to communicate things clearly between each other" *(Respondent 40)*. Finally, respondents indicated social investors can be convinced to invest in the BM by using BM meta-models *(Respondent 03, 26, 40, 41, 42, 43, 44, 45, 46)*. BM meta-models are of vital importance for this last purpose. As indicated by *respondent 03* (Social investor):

"Every now and then they invite me for inspirational dinners from Ashoka. I'm not coming anymore. I don't need extra … being extra inspired. I need a plan. Give me a plan. Give me a plan. Give me a pitch plan. Give me an idea. Give me numbers. Then I can think about it." (Respondent 03)

What is so important about determining the aim of communication, is that depending on your specific purpose, relevant features of the BM meta-model can be determined, enhancing comprehensiveness and irrelevant information can be excluded, enhancing comprehensibility. Social investor respondents, for example, indicated that they require, amongst others, information on a BM's competitive environment *(Respondent 42)*, the capabilities of the management team *(Respondent 40, 42)*, and issues encountered in the process of growth *(Respondent 03, 42, 46)* in order to be convinced to invest. Consequently, these features should be part of the BM meta-model. However, when the goal is to create a common language in a team, these features never came up.

Despite this example, there was overall no agreement between respondents on what purpose requires what features. During a pitch deck, for example, *Respondents 43 & 45* indicated the importance of bringing in causal structures in the meta-model to convince social investors. "If you want to find investors for these NBSs, of course, you have to, you have to somehow explain how these NBSs will

make a difference and these causal loops, you of course, want to bring into that." *(Respondent 45)*, whereas another respondent indicated: "As an investor, I would think the business canvas (which excludes causal structures) gives a nice one-pager on your business. It's still simple and it really defines it very clearly." *(Respondent 42)*. Similarly, respondents do not agree on what tool is most suited to develop organisational thinking. While some respondents prefer a derivative of one of the business canvases for this purpose *(Respondent 40, 41, 43)*, one other preferred causalities to be included in the model *(Respondent 42)*:

"It's just because it's a discussion tool, I would never use it for anything else apart from that. So that's what it is to me. It's a canvas to keep continuously developing rather than say, here's a dense or a summarized version, because it's just a tool to help remember that we haven't spoken about the relevance between our goals and our cost to whatever today and, so yeah, it looks pretty dense the way it's presented now, but then this would have been the output from many co-created inputs." *(Respondent 41)*

"The mind map, the loop diagram, is more of an informal brainstorming." *(Respondent 42)*

4.3.2. Explore institutional differences

As stated before, the BWLs collective identified three crucial stakeholder groups required to collaborate in the process of implementing and scaling NBSs, (1) weavers, (2) social entrepreneurs, and (3) social investors. To make BM meta-models adequate knowledge-sharing systems that foster collaboration between these stakeholders, institutional differences between the categories need to be understood and taken into account when using BM meta-models. Doing so contributes to achieving high levels of comprehensibility and comprehensiveness.

Weavers rely on networking

To fulfil their function weavers obtain information on NBSs by networking both inside and outside their bioregion *(Respondent 40, 41, 45)*. To assess a bioregion and to create fits between NBSs and bioregions internal networking is of importance. There is so much going on already in the bioregion, and by building trust, visiting local innovators on their site, and inviting local innovators to workshops, weavers can obtain the information *(Respondent 40, 41, 45)*. It is essential to learn from the local people, including, for example, local governors and politicians, or biodiversity and spatial experts in the region, as they work every single day on an NBS. "The amount of expertise of anyone that's working in those areas, I think is just something we have to respect enormously. You know, any farmer, they know so much and I think we just got to bow down and respect how much they already understand of NBSs" *(Respondent 41)*.

Weavers also network outside their bioregion, which is especially important for a weaver to be able to function as a changemaker, by relying on two sources of information *(Respondent 40, 41, 45)*. On the one hand, weavers can have information available via the BWLs collective learning environment. The

BWLs portfolio, for example, provides a range of over 50 different NBSs that can provide ideas to scale positive social change in a bioregion. Be aware that "there is no such portfolio that you look at like in a restaurant looking at the menu and then you choose" *(Respondent 40)*. As indicated earlier, all these solutions need to be carefully checked against the bioregion's specific context, to modify them and create a fit in the bioregion *(Respondent 40, 41, 45)*. On the other hand, weavers can also gain knowledge from their own experiences and networks unrelated to the work of the BWLs collective *(Respondent 40, 41)*. This knowledge can also be used to scale positive social change in a bioregion. As an example, one respondent indicated: "I came to Sweden as a social entrepreneur with already existing solutions in my bag, …, so we already had tools that were started to be designed before Sweden. So in my case, it was OK let's look at the reality and OK, we have some tools available. We have our skills, we have the capacity as it is." *(Respondent 40)*.

Answers to what extent BM meta-models are used to discuss NBSs during these networking processes were very diverse. One weaver was not familiar with the concept of BM meta-models and consequently did not use them in networking processes *(Respondent 45)*. Nevertheless, this respondent was optimistic about their value for both obtaining info him/herself, "I would also be able to obtain some new information myself as well because I feel like it's very direct." *(Respondent 45)*, and for communicating towards other stakeholders like farmers, politicians and funders. Another weaver was very familiar with the concept and had already used CLDs for systems mapping, and different business canvases to develop entrepreneurial thinking as part of the change-making process *(Respondent 41)*. On the question of whether BM meta-models should be part of the BWLs collective's portfolio, all weavers reacted sceptical, as they indicated that the portfolio is there simply to provide ideas *(Respondent 40, 41, 45)*. "If I was the one creating the portfolio, I would be afraid to bring too much bias into that, bringing in these fixed diagrams, fixed ideas, right? Not necessarily fixed ideas, but I'm painting a very distinct picture in the mind of the person reading my portfolio." *(Respondent 45)*.

Social investors need BM meta-models

The only task of a social investor to scale positive social change is to invest for social return, possibly in addition to financial return *(Respondent 03, 26, 42, 46)*. However, based on the interview an important distinction is emphasized between social investors that invest in specific NBSs and social investors who invest in umbrella organisations, such as Ashoka and Commonland. The two corporate foundations interviewed indicated that they only support umbrella organisations *(Respondent 26, 46)*. "So, we support Ashoka Netherlands, the BWL and we support some funding for staff. That also has very practical reasons. It's reasons of, if we give funds to someone in the Netherlands, it's easier to

give it to the Netherlands and they pass it on somewhere. For us, it gets (otherwise) very complicated. We have German regulations that make it even worse." *(Respondent 46)*.

Social investors obtain information on NBSs by having them presented in pitch decks primarily by social entrepreneurs *(Respondent 03, 26, 42, 46)*. Within these pitch decks, BM meta-models are often encountered as they are "a good way of telling what you do in a very short time. And that's basically, what investors are looking for initially, that you, in a pitch, in a very short time frame, can tell the essence of your business" *(Respondent 42)*. The importance of using BM meta-models in convincing social investors was touched upon before in section 4.3.1. of this research, but is emphasized here with the following two quotes:

1. "But if you look from the investor perspective… we are professionals, so we like to think in a professional way." (Respondent 03)

2. "Because I feel like many, many stakeholders that are involved in funding and in politics and in that kind of stuff, in the organizational stuff. Maybe I feel like they are more inclined to look for certain buzzwords and they are more inclined to value the way things are framed. And I feel like the flourishing business canvas is more useful for this stuff." (Respondent 45)

As indicated earlier, no consistency is found in what BM meta-models are or should be used, although all social investors emphasize the importance of the display of impact measurement *(Respondent 03, 26, 44, 46)*. In addition, it is also possible that social investors perform their own research to obtain information on NBSs by invoking a database and contacting start-ups *(Respondent 42)*

Social entrepreneurs include storytelling

Social entrepreneurs have multiple functions, two of which are relevant here. First, social entrepreneurs are required to attract public and private funding *(Respondent 40, 43, 44)*. Secondly, social entrepreneurs should communicate their NBS to many other stakeholders *(Respondent 43, 44)*. Weavers are especially important here, as they help social entrepreneurs scale their positive social change, as well as target beneficiaries. After all, this latter group must know of the NBS to be able to benefit from it. Social entrepreneurs present their NBSs in pitch decks using BM meta-models as explained above. However, one social entrepreneur indicated the use of story-telling as a means to attract funding *(Respondent 44)*. The respondent indicated: "Telling stories helps people. Firstly, to have their attention longer, but also to remember it when they have to, disseminate the story further" *(Respondent 44)*. Nevertheless, the respondent mentioned the need to attach graphs to the story. Seeing the importance social investors attach to BM meta-models, a story can never go without a plan *(Respondent 03, 42)*. Note that none of the interviewed entrepreneurs had made use of CLDs yet *(Respondent 40, 43, 44)*. In terms of their communication to target beneficiaries, little information was obtained. *Respondent 43* indicated his/her organisation makes use of its own TV program, podcasts and website to reach target beneficiaries. No mention of BM meta-model tools was encountered here.

5. Discussion

This section discusses the findings of this research. First, a framework is introduced that sets out the lines for businesses to enhance the comprehensiveness and comprehensibility of the BM meta-models they use. During the explanation of the framework, the theoretical and practical contributions of this research are clarified (5.1). Secondly, the limitations of the research are highlighted and some directions for future research are discussed (5.2).

5.1. The three-step framework for complete and simplified BM meta-model communication

Bringing the findings into synthesis, a three-step framework is created that sets the scene for businesses willing to enhance the comprehensiveness and comprehensibility of their BM meta-models simultaneously. Steps 1a and 1b pursue both constructs, whereas steps 2 and 3 are only focused on improving comprehensibility further. When following up on the proposed steps, a business will be able to present its BM's impact on socio-ecological systems, while at the same time keeping the model understandable to our mind's cognitive capacity. The framework is innovative, primarily as it stresses the importance of determining the purpose of a BM meta-model use and the assessment of the meta-model's recipient prior to meta-model selection to enhance the comprehensibility of the model, rather than relying on the multivocal symbols and traits of BM meta-models, as is common up until now in a research stream dominated by the BMC of Osterwalder & Pigneur (2010). Moreover, doing so will help determine all relevant features that need to be included in the meta-model, enhancing comprehensiveness. The three-step framework is presented in Figure 10 and discussed below.

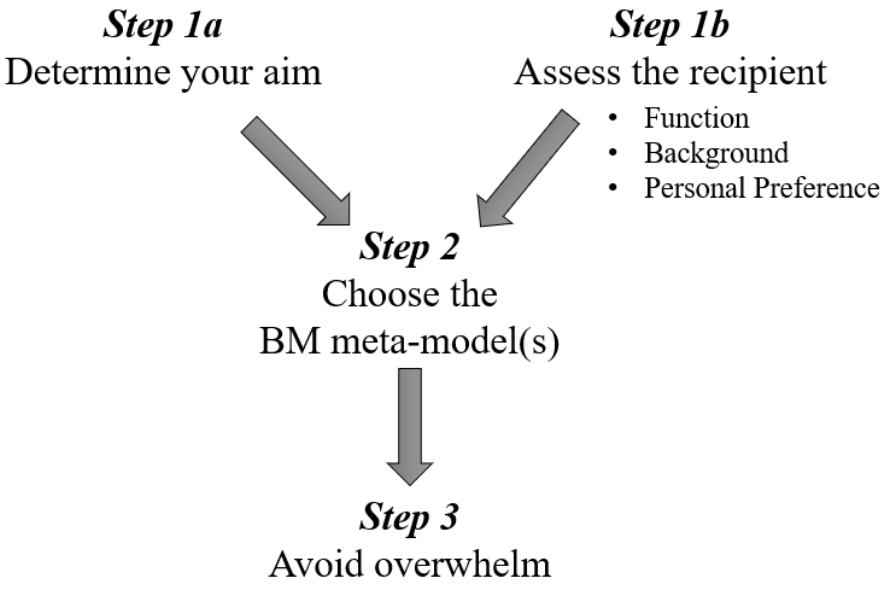

Figure 10: 3-step Framework for Complete and Simplified BM meta-model Communication

Step 1: Prepare your choice

The choice of the right BM meta-model requires careful deliberation of the purpose of communication and the assessment of the BM meta-model's recipient.

Step 1a: Determine your aim

"For what purpose is the BM meta-model introduced?" is the first important question, a business should ask itself. If the sole goal of the BM is to explain its impact on socio-ecological systems, the business needs to include only four specific BM features within the meta-model, as identified in this research. Regarding the first three features, (1) the social and environmental value captured by the BM, (2) the key activities and processes of the BM, and (3) the causal structures explaining how the impact has been realized, this research confirms existing literature, who indicated the need of these features already. Amongst others, Furnari (2015) and Schaffer et al. (2019) indicated the requirement of including causalities in BM meta-models already to assess a BM system's perspective. Whereas, BM's key activities and processes, as well as the captured value, simply always return in existing BM meta-model templates adapted to meet sustainability requirements (Antikainen & Valkokari, 2016; Flourishing Enterprise Co-lab, 2022; Lewandowski, 2016; Sparviero, 2019). For more information on how businesses should display their captured social and environmental value, I refer to the project of one of my fellow students, Johanna Gärtner. However, on any other necessary features to display a BM's impact on socio-ecological systems, scholars did not agree on what these should be (Antikainen & Valkokari, 2016; Flourishing Enterprise Co-lab, 2022; Iacob, et al., 2012; Lewandowski, 2016; Massa, et al., 2018; Massa, et al., 2017; …). This research argues that only one additional element is required to display the complete image, namely, the initial need and context of the affected system. Some scholars did include this feature already in their BM meta-models (Antikainen & Valkokari, 2016; The Flourishing Enterprise Co-lab, 2022), while others did not (Lewandowski, 2016; Sparviero, 2019). Consequently, practitioners can stick to these four features in the future when presenting BM's impact on socio-ecological systems.

It is also possible that the BM meta-model is used for other purposes, and that displaying a BM's impact on socio-ecological systems does not belong to or is merely one part of the information that needs to be transferred to the audience. In that case, the meta-model requires additional or other features. This research identified four examples of other purposes, (1) opening the mindsets of entrepreneurs, (2) developing organisational thinking, (3) creating a common language and (4) convincing social investors. The existence of further BM meta-model purposes did not arise during interviews. However, based on the literature review, their existence is acknowledged (Chen, et al., 2019; Coes, et al., 2014; Cosenz & Noto, 2018; Iacob, et al., 2012; …). For each purpose, a business should consider all relevant aspects

that the BM meta-model should include to meet the purpose and enhance comprehensiveness. While this research has provided indications of what purpose requires what BM meta-model features, e.g. convincing social investor requires, amongst others, presenting the capabilities of the management team, the competitive environment, and issues in encounter in your plan, it has not been able to contribute set guidelines. Once the purpose and the corresponding meta-model features have been determined, it is vital to stick to these features and not include any additional ones. Redundant information can only make things more complex and confusing, reducing comprehensibility.

Step 1b: Assess the recipient

Concurrent to step 1a, a business should assess the recipient of its BM meta-model before choosing which BM meta-model it is going to use. Interindividual differences have for a long time been acknowledged as determining an individual's cognitive capacity, and should therefore be considered when enhancing comprehensibility of BM meta-models (Kleinsorge, 2021; Mikolon, et al., 2015). In this regard, the framework builds further on a study by Bouwman et al. (2020), which indicated the importance of asking yourself who the target audience is of a BM meta-model to assess its utility, but without further expanding on it. The three-step framework adds to this argument that the audience will differ mainly on three variables, namely function, personal background, and personal preference, which, consequently, need to be assessed by businesses before choosing a BM meta-model to communicate with.

First of all, assessing a recipient's function is important, to enhance both comprehensiveness and comprehensibility of BM meta-models, and refers to the findings on consideration of interinstitutional differences. Based on their institutional background, recipients can have very different needs and interests in BM meta-models. Weavers, for example, require a limited understanding of specific NBSs to perform their function as fieldworker and rely, therefore, primarily on networking and less on BM meta-models to gain information on NBSs, while social investors require detailed information on NBSs that can be provided by BMs in order to make an investment decision. As social entrepreneur, or business in general, it is important to take this into account, and for example, opt for a basic ToC meta-model, as presented in Figure 9, in communication towards a weaver. Such a BM meta-model can make the weaver curious and can help weavers scan their environment and determine where networking is valuable. The ToC meta-model transfers limited information, but that is sufficient for weavers to perform their function more efficiently. In communication with a social investor, however, a social entrepreneur should better opt for a more all-inclusive BM meta-model, such as the FBC, for example, supplemented with other information and/or meta-models. Assessing the recipient's function will allow businesses to transfer a BM meta-model including all relevant aspects the recipient is looking for, enhancing comprehensiveness, and excluding irrelevant features, enhancing

comprehensibility. Storytelling can be used by social entrepreneurs, but it should always be backed up with concrete plans in case social investors ask for it.

However, as indicated in the results, there is more to consider. Even within specific stakeholder groups, needs and interests in BM meta-models can still differ very strongly. This study indicated two variables responsible for this, the recipient's personal background and preference. Someone's personal background and someone's personal preference are very much related to each other. Nevertheless, the distinction was made since the personal background illustrates best what BM meta-models someone will be familiar with and understand, (e.g. someone with an educational background in service design will probably understand a CLD), whereas the personal preference tells better what BM meta-model and what features someone would like to encounter in the BM meta-model (e.g. preference for environmental metrics, rather than social metrics). Moreover, it is argued that personal background is easier to discover than personal preference, for example, through the internet, in particular social media, whereas, to discover personal preference building relationships is required.

By taking all this information into account, the BWLs collective can stimulate its social entrepreneurs to adapt their BM meta-models to their audience, and consequently share knowledge more adequately and effectively as identified as an important need to scale NBS-driven positive social change more effectively (Hussain, et al., 2022). More in general, this implies that BM meta-models are a bit more limited in bridging institutional differences than first thought (Osterwalder & Pigneur, 2005). After all, businesses are required to understand the thinking and behaviour of the BM's audience to opt for the right BM meta-model and transfer the information adequately, rather than that BM meta-models are universally understandable. Consequently, the three-step framework comes at the right time, as multi-stakeholder collaborations are expected to expand further to achieve the sustainable development goals, in which stakeholders will become increasingly diverse and assessing the recipient of the meta-model, thus, will become increasingly important (United Nations, 2023).

Step 2: Choose the BM meta-model(s)

By gathering all the information in the previous steps, the business will have a very good idea at this point of what BM meta-model to choose that includes all relevant features and is comprehensible for the cognitive capacity of the recipient. This research has given an overview of a range of BM meta-models in the literature discussing their main drawbacks that can be used by businesses as a source of inspiration in their choice. In particular, this research discussed two BM meta-models that are able to display a BM's impact on socio-ecological systems, namely a CLD and a ToC framework. However, businesses should always carefully assess how to include all other content they want to transfer in these BM meta-models. It is possible to opt for spreading the information over multiple BM meta-

models, which is encouraged if the business believes it will enhance comprehensibility. This is already common in investor pitches but can be followed up for other purposes.

Step 3: Avoid overwhelm

Finally, as indicated any recipient can be overwhelmed by information. It is therefore important to always limit the words to what businesses believe is necessary to convey its message to the specific audience. It is difficult to give set guidelines here on what is acceptable, as it will again depend on the recipient's profile whether the information will be perceived as overwhelming or not.

5.2. Limitation and directions for future research

This research has been subject to several limitations. First of all, three methodological limitations need to be designated. First, the study is based on constructivism as underlying epistemology, supporting the construction of knowledge by the individual (Karagiorgi & Symeou, 2005). This in itself is not a limitation, since constructivism has for a long time been acknowledged as a prominent epistemology (Yazan, 2015). However, as with any epistemology, its limitations should be highlighted to allow the reader to interpret the results correctly. One thing, in particular, is important to mention here, namely that knowledge construction, following Merrian's (2009) constructivist principles, will always be sensitive towards the influence of individual perspectives and interpretations (Yazan, 2015). As the researcher, it is not possible to indicate where in this research this may have influenced the findings. However, the quotes table in Appendix I gives the reader an overview of the most important quotes the findings are based on, attenuating this bias.

Following up on this limitation, are two limitations related to the context-specificity of the results. On the one hand, this research focussed on one specific category of BMs to answer the research question with, namely NBSs and is established within the context of the BWLs collective. Consequently, the research focused on communication of NBSs between only three stakeholder groups, admittedly, identified as crucial in scaling positive social change with NBSs by the BWLs collective. Other stakeholder groups businesses can communicate to using BM meta-models were excluded from the research, such as regulators, and its employees. No information is provided on the aim of communicating to these stakeholders or on their needs and interests in BM meta-models. On the other hand, significant overlap between the analysed cases could not be guaranteed in this research. Although the aim was to select three social entrepreneurs of NBSs belonging to the same NBS category, the case study selection strategy did not allow this. However, while this was thought of initially as a limitation, it actually allowed to draw more broadly and investigate what BM meta-model features are necessary to display a BM's impact on socio-ecological system in general, rather than for a specific type of NBSs.

Related to the findings, the study was able to provide only limited insights into what the relevant BM meta-model features are for each aim of communication. Further research is necessary to set fixed guidelines on what building blocks and features which aim requires. Moreover, while the research could provide some insights into the needs and interests of weavers and social entrepreneurs in BM meta-models, more research is required to create more depth in the understanding of which features certain stakeholders are interested in. One thing, in particular, is important to point out here. Within the findings, the distinction was made between social investors who invest in specific NBSs and those who invest in umbrella organizations. This research has not been able to make a valid attempt to understand what the consequences of this distinction are for the use of BM meta-models. Consequently, further research is required to understand how BM meta-models will differ to convince a social investor to invest in an umbrella organization or in a specific NBS. Moreover, in the respondent validation interview, the respondent pointed out the possibility of investing in a BM portfolio of NBSs. The notion of a BM portfolio is an emerging theme within the strategic management literature, referring to "multiple BMs operated and managed by an organisation" (Westerveld, et al., 2023) (Schwarz, et al., 2017; Toutaoui & Benlian, 2020). Again, this can have consequences for how to present the BM meta-model. How, for example, the added value of investing in a portfolio of innovation, rather than one single NBS be presented in the model?

One last direction for future research is also related to the notion of BM portfolio's. An increasing number of organisations run more than one BM in parallel for diverse reasons (Aversa, et al., 2017; Casadesus-Masanell & Tarzijan, 2012; Schwarz, et al., 2017; Snihur, et al., 2022; Wiener, et al., 2018). Although NBSs have high potential in creating social and environmental value, practitioners, such as the BWLs collective struggle to implement NBSs and reach the point where involved communities become self-sufficient and are able to sustain the NBS without external help (Mayor, et al., 2021). However, running multiple NBSs simultaneously is another means that could help the BWLs collective to scale positive social change faster, on the premise that synergies are found between the NBSs, a strategy referred to as 'complementing' of BMs (Schwarz, et al., 2017; Westerveld, et al., 2023). A synergy is "the combined power of a group of things when they are working together that is greater than the total power achieved by each working separately" (Cambridge University Press & Assessment, 2023). Identifying synergies can increase the overall value delivered by the BMs in place, as for example redundant resources can be saved, communication can be delivered through additional channels, and existing activities can serve additional purposes (Westerveld, et al., 2023). To identify the synergies, the building blocks of different BMs can be compared to each other by means of BM meta-models, as is the case in the following studies: Gilibert & Ribas (2019); Hoßbach (2015); Toutaoui & Benlian (2020); Wiener et al. (2018). Typically, the different BMs are mapped into the BM meta-models, which then, together with interview data illuminate synergies between different components, that can later be

leveraged. Unfortunately, the example studies, make use, again, of BM conceptualizations rooted in the financial profit-oriented paradigm, such as the BMC. Consequently, more research is necessary to study how BM meta-models should be adapted to act as a synergy identification tool for businesses. Managing BM portfolios is complex, but succeeding can yield multiple benefits for the bioregion, scaling positive social change at a speed unthinkable before (Westerveld, et al., 2023). For example, according to Mayor et al. (2021), “the scale of individual NBS projects (often less than 500,000 EUR) is too small for private sector investors, suggesting that a portfolio approach (bundling multiple NBS projects for investment) might be needed”.

6. Conclusion

Humanity's increasing negative impact on socio-ecological systems has caused businesses to reflect on how their BM's affect socio-ecological systems in BM meta-models. In doing so, businesses have failed to achieve the levels of comprehensiveness and comprehensibility they traditionally did in BM meta-models. In search for a BM meta-model able to present all relevant aspects of BM's understandable to our cognitive capacity, this research has brought broader implications for the research stream on BM meta-models to the surface, synthesized in a three-step framework that sets out the lines for businesses to enhance the comprehensiveness and comprehensibility of their BM meta-models. The framework relies on four processes; (1) determine your aim; (2) assess the recipient; (3) choose the BM meta-model(s); and (4) avoid overwhelm, and is innovative primarily as it urges businesses to assess the aim of their BM use, as well as perform an assessment of the BM meta-model audience and adapt the meta-model in function of these assessments to make the BM meta-model comprehensible, rather than rely solely on multivocal symbols and specific BM meta-model traits. Assessing the recipient of the BM involves exploring three important variables, (1) the recipient's function, (2) its personal background, and (3) its personal preference. The framework reinforces BM meta-models as adequate knowledge-sharing tools for businesses, including the bioregional weaving labs collective, the partner organisation of this research, capable of taking into account the needs and interests of different stakeholder groups.

Furthermore, this research indicates BM meta-models require four specific features to display a BM's impact on socio-ecological systems, namely (1) the initial need and context of the system, (2) the BM's key activities and processes, (3) the causal relationships between the BM's building blocks, and (4) the societal and ecological value created by the model. In case the only purpose of a business is to display the BM's impact on socio-ecological systems these are the only four features that need to be included in the BM meta-model. All other features are then redundant. The research identified two BM meta-models capable of displaying these four features simultaneously, namely the CLD and the ToC framework.

Finally, more research is necessary to provide deeper insights into the needs and interests in BM meta-models of both the stakeholder groups involved in the research and other stakeholder groups excluded from the study, and to set fixed guidelines on which aim requires which BM features included in the meta-model to achieve comprehensiveness. This research was only able to provide limited insights into these topics. Moreover, an interesting area for future research is how BM meta-models should be adapted to serve as an effective identification tool of synergies between different BMs to scale positive social change more effectively.

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Appendix A: BWLs collective's strategy

(BWLs collective, personal communication, March 2023)

Appendix B: Research questions of colleague students

Student	Research Question
1. Günter Daniel	*How can institutional logics explain the lack of funding and investment in nature-based solutions?*
2. Gärtner Johanna	*How can social entrepreneurs utilize impact measurement to reduce institutional complexity for assessing financial capital?*
3. Klein Rowdy	*How is Collective Social Entrepreneurship perceived to influence the scaling of NBS?*
4. Maes Seppe	*How can businesses restore the disrupted levels of comprehensibility and comprehensiveness in BM meta-models stemming from the growing importance of BM's impact on socio-ecological systems?*
5. Ortenburg Johannes	*How can multi-stakeholder partnerships for landscape restoration leverage the business model elements of their projects to scale environmental, social, and financial impacts?*
6. Sabel Thom	*How can Dutch Social Enterprises manage their financing strategies through various stages of their lifecycle to enhance access to financial resources?*

Appendix C: Case selection

	Criteria 1	Criteria 2	Criteria 3	Criteria 4	Meeting all 4 criteria
1. Herenboeren	1	1	1	1	yes
2. Savory Institute	1	1	1	1	yes
3. Farming for Nature	1	1	1	1	yes
4. GIY (Grow It Yourself)	1	1	1	1	yes
5. Sea Ranger Service	1	1	1	1	yes
6. Bioregional	1	1	1	1	yes
7. Hoge Kempen National Park	1	1	1	1	yes
8. Klub Gaja	1	1	1	1	yes
9. Incredible Edible	1	1	1	0	no
10. BeeOdiversity	1	1	1	0	no
11. Fundacja Łąka	1	1	1	0	no
12. ReNature	0	0	?	0	no
13. BESE-products	0	0	?	0	no
14. Soul food forest farms	0	0	?	0	no
15. Bloom	0	0	?	0	no
16. Sustainable Food Trust	0	0	?	0	no
17. North Sea Farmers	0	0	?	0	no
18. Regionalwert AG	0	0	?	0	no
19. Intent	0	0	?	0	no
20. Climate Farmers	0	0	?	0	no
21. Asociación Forestal de Soria	0	0	?	0	no
22. Pur Projet	0	0	?	0	no
23. European Rivers Network	0	0	?	0	no
24. Fundación Lonxanet	0	0	?	0	no
25. Slow Food	0	0	?	0	no
26. En Direct des Eleveurs	0	0	?	0	no
27.Terre de Liens	0	0	?	0	no
28. Terre et Humanisme	0	0	?	0	no
29. Ludia a voda	0	0	?	0	no
30. The Weather Makers	0	0	?	0	no
31. Soil Capital	0	0	?	0	no
32. Citizens Forests	0	0	?	0	no
33. Drawdown Europe	0	0	?	0	no
34. Klimamoor Brandenburg	0	0	?	0	no
35. Client Earth	0	0	?	0	no
36. True Footprint	0	0	?	0	no

Criteria 1: Archival data on the innovation is available in the BWLs collective's bid book (January 2021).
Criteria 2: An archival interview is available with the entrepreneur behind the NBS.
Criteria 3: The entrepreneur behind the NBS can be approached in either Dutch or English
Criteria 4: In the bid book, funding/investment is specifically mentioned as a challenge in scaling impact for the NBS.

Appendix D: Overview of all 58 interviews

Interview #	Organisation	Interviewer
1	Blue Parasol	Daniel Günther
2	Reframe Ventures	
3	Surmount Ventures	
4	Shaping Impact Group	
5	Citizen Forests	
6	Fundacion Lonxanet	
7	Hooge Raedt Social Venture	
8	Horizon Nua	
9	XXXXXX [Not Disclosed]	
10	Permarchitecture	
11	SNV	
12	TreeStory	
13	Mustard Seed Trust	
14	The Pollinators	
15	Biotomy	
16	Griessler Bulc	
17	Circonnact	
18	IRIDRA	
19	Fair Capital Partners Impact Investing	
20	Farming for Nature	Johanna Gartner
21	Impact Capital	
22	Anatolian Grasslands	
23	Commonland	
24	Climate Farmers	
25	Beeodiversity	
26	DRK Foundation	
27	Incredible Edible	
28	True Footprint	
29	DIIF	
30	Savory Institute	Johannes Graf zu Ortenburg
31	Klub Gaja	
32	AlvelAl Association	
33	Blueventures	
34	Kogayon Association	
35	AlvelAl Association	
36	Agroforesterie	
37	Regionalwert AG	Rowdy Klein
38	FoodNetworks	
39	XXXXXX [Not Disclosed]	
40	OTAG	Seppe Maes
41	Grow It Yourself (Weaver)	
42	We Share Ventures	
43	Grow It Yourself	
44	Hoge Kempen National Park	
45	Landschaftspflegeverein (Weaver)	
46	Bosch Foundation	
47	Commonland	Thom Sabel
48	DGB	
49	Ecologi	
50	OysterHeaven	
51	Corekees	
52	Bamboologic	
53	Investancia	
54	NewEconomy	
55	North Sea Farmers	
56	reNature	
57	Sea Ranger Service	
58	We Share Foundation	

Appendix E: Interview Manual A – Social Entrepreneurs

General questions:

Q1: Can you tell me something about yourself?
- How are you related to the BWL?

Q2: Can you introduce your nature-based solution in a couple of sentences?

Specific questions – Section 1:

Q3: In the process of scaling social impact, who are you communicating your innovation too?
- How important is it to communicate your innovation to (1) Weavers? (2) Funders? (3) Customers?
- Why do you need to communicate the information to (1), (2), (3)?

Q4: What (elements) about your innovation do you find important to communicate to these parties?
- Can you elaborate on … (*make sure everything is very clear here!)*

Q5: How do you communicate this information?
- What problems do you encounter in this process?
- How do other social entrepreneurs cope with these problems?
- What would improve your ability to communicate this information?

Q6: Are you familiar with the concept of BM frameworks?
- *If yes, verify*
- *If no, explain*

(Simply explained, BM frameworks are models of BMs "that consist of the essential elements and relationships of the BMs they aim to describe". BM meta-models are of value for many different reasons (e.g. making sense of complexity, communicating towards stakeholders, facilitating BM innovation, …). The most famous BM framework is the BMC by Osterwalder & Pigneur (2010).)

Specific questions – Section 2:

I've tried to map the NBS of Grow It Yourself, Ireland in two of these frameworks
1. The Flourishing Business Canvas, an updated version of the famous BMC that takes, amongst others, into account the social and environmental that is captured by a BM.
2. A causal loop diagram, which in addition to the FBC, takes into account the causal structures present in between different building blocks.

➔ *Make sure interviewees understand the frameworks and the information in them*.

Q7: Are you familiar with the causal loop diagram?
- Did you ever use it for systems mapping?

Q8: Do you believe these types of frameworks are of any value for communicating your NBS?
- Can such a framework make it easier to communicate the relevant information than is the case now?
- To whom will the communication be easier?
- In what stage of the communication process are they valuable?

Q9: Which of both models would you prefer to communicate your NBS, and why?
- Does it meet all your communication wishes? Or what is it still missing?
- Is there redundant information available?
- What makes it better than the other framework?
- What is the other framework missing?
- Do you consider causal structures important to communicate, and why?

Appendix F: Interview Manual B – Weavers

General questions:

Q1: Can you quickly tell me something about yourself and briefly introduce your job?

- What is the role of a weaver?

Q2: Can you tell me something about the region you are active in?

- What are the fundamental needs identified in the bioregion?
- What is currently happening in the region?
- What is developing that makes you hopeful?
- What is developing that frustrates you?

Specific questions – Section 1:

The BWLs collective's long-term strategy for scaling systemic innovations in a bioregion consists of 5 steps: (1) Mapping the bioregion, (2) Selecting & exhibiting the most promising solutions for the bioregion, (3) Matching & Preparing solutions, (4) Co-creating & Prototyping, (5) Scaling & Integrating

➔ *Provide PowerPoint image to clarify the 5 steps*

Q3: How do you determine what solution you are going to select for potential integration in step 2? *(Clarify that you already know the systemic needs of the bioregion at this point.)*

- Do you make use of a portfolio of NBSs?

Q4: In the process of selecting potential NBSs to scale social impact in the bioregion what information on NBSs is required to have available?

- What do you need to know about the NBS to make an implementation decision?

Q5: How do you obtain this information?

- What problems do you encounter in this process?
- How do other weavers cope with these problems?
- What would improve your ability to obtain this information?

Q6: Are you familiar with the concept of BM frameworks?

- *If yes, Verify*
- *If no, Explain*

(Simply explained, BM frameworks are models of BMs "that consist of the essential elements and relationships of the BMs they aim to describe". BM meta-models are of value for many different reasons (e.g. making sense of complexity, communicating towards stakeholders, facilitating BM innovation, …). The most famous BM framework is the BMC by Osterwalder & Pigneur (2010).)

Specific Questions – Section 2:

I've tried to map the NBS of Grow it Yourself, Ireland into two of these BM frameworks

1. The Flourishing Business Canvas, an updated version of the famous BMC that takes, amongst others, into account the social and environmental that is captured by a BM.
2. A causal loop diagram, which in addition to the FBC, takes into account the causal structures present in between different building blocks.

➔ *Make sure interviewees understand the frameworks and the information in them*.

Q7: Are you familiar with the causal loop diagram?

- Did you ever use it for systems mapping?

Q8: Do you believe these types of frameworks are of any value for obtaining information on specific nature-based solutions in the selection phase?

- Can such a framework make it easier to obtain the relevant information than is the case now, why?
- What information is easier to obtain?

Q9: Which of both frameworks contains the most information that you require?

- Does it contain all the information you would like to have? Or what is it still missing?
- Is there redundant information available?
- What makes it better than the other framework?
- What is the other framework missing?
- Is it important to have the causal structures available in de the framework?
- Do you miss important content in the Flourishing Business Canvas?

Q10: Could such a framework potentially be valuable in another stage of the scaling social impact strategy?

- Could such a framework be used to convince potential investors?

Appendix G: Interview Manual C - Social Investors

General questions:

Q1: Can you briefly introduce yourself?
- Can you briefly introduce your job?

Q2: Can you tell me something about the company you work for?
- What type of projects does the company invest in?

Specific questions – Section 1:

Q3: What are the most important considerations for investing in an NBS and why?
- When will you decide to invest in a social project, and when not?
- (How important is financial return in these criteria?)
- Are there any criteria that are standing above the other criteria in terms of importance for the investment decision?

Q4: How do you obtain the information on your investment criteria?
- What problems do you encounter in this process?
- How do other investors cope with these problems?
- What would improve your ability to obtain this information?

Q5: Are you familiar with the concept of BM frameworks?
- *If yes, Verify*
- *If no, Explain*

(Simply explained, BM frameworks are models of BMs "that consist of the essential elements and relationships of the BMs they aim to describe". BM meta-models are of value for many different reasons (e.g. making sense of complexity, communicating towards stakeholders, facilitating BM innovation, …). The most famous BM framework is the BMC by Osterwalder & Pigneur (2010).)

Specific Questions – Section 2:

I've tried to map the NBS of Grow it Yourself, Ireland into two of these BM frameworks
1. The Flourishing Business Canvas, an updated version of the famous BMC that takes, amongst others, into account the social and environmental that is captured by a BM.
2. A causal loop diagram, which in addition to the FBC, takes into account the causal structures present in between different building blocks.

➔ *Make sure interviewees understand the frameworks and the information in them*.

Q6: Do you believe these types of frameworks are of any value for obtaining information on Nature-based solutions?
- Can such a framework make it easier to obtain the relevant information than is the case now?
- What information is easier to obtain?
- Where, in the process of information exchange would these frameworks fit?

Q7: Which of both frameworks contains the most information relevant to you?
- Does it contain all the information you would like to have? Or what is it still missing?
- Is there redundant information available?
- What makes it better than the other framework?
- What is the other framework missing?
- Is it important to have the causal structures available in de the framework?

Appendix H: Information and consent form (ethics and privacy)

Information and consent form

Introduction

My name is Seppe Maes, I am a Master's student of the Global Business and Sustainability program at Rotterdam School of Management, Erasmus Universiteit Rotterdam. This research is part of my Master's thesis on multi-stakeholder partnerships for landscape restoration projects and nature-based solutions (NBSs). With this information and consent form, I would like to inform you about the study and what participation in the study means.

Please sign the document at the end, if you agree to your participation in the study. Please contact me if there are any questions remaining.

What is the research about?

The research is written in partnership with the Bioregional Weaving Labs (BWLs) Collective. The partnership with the Rotterdam School of Management and the BWLs collective is aimed at scaling social impact and will help the BWLs collective in their everyday work. A total of 6 students are active in this partnership, all focussing on different domains to scale social impact faster.
My own research focuses on the analysis of what elements from various business model frameworks are important for Nature-based Enterprises, funders and private investors in the communication between funder/investor and grantee/investee. The assumption is that the investment gap in NBSs and social innovations can be (partially) explained by the difference in focus on certain elements of the business model between funder/investors and grantees/investees and the information that they actually need. By researching what elements of business models the different parties focus on, the aim is to find a BM framework that is best at capturing all those aspects together and that can, therefore, facilitate easy communication and serve as a tool between investor, weaver and social entrepreneur."
For the analysis, I make use of a qualitative research approach, implying (publicly) accessible documents are collected and analysed, and interviews are conducted.

Why are we asking you to participate?

You are invited to participate in this research because of your involvement and practical experience regarding concepts and constructs such as 'grand challenges', 'social entrepreneurship, 'landscape restoration', 'nature-based solutions', 'multi-stakeholder collaborations and partnerships', and 'weaving'. Your insights can give people in practice and in science a lot of knowledge and ultimately lead to the further development of these fields. The work you are involved in contributes towards a more sustainable future for all of us, and the aim is therefore to share your ideas, insights and initiatives with the rest of the world.

You decide whether to participate

Participation in this study is completely voluntary, and without obligation. Your data and personal information are protected and, anonymised in translations to academic articles, practical manuals, and other publicly accessible publications. You can stop your involvement at any time, without the provision of any explanation.

What will we do or have we already done?

I will engage in an interview with you and ask questions related to my research, explained above. In the course of the process, the conversations are recorded, transcribed, (translated), and analysed for processing into an academic publication. If you do not wish to answer a question during an interview - or wish to revise or delete an answer or phrase after an interview – you are free to do so, or contact me.

The collected data is handled with care; it is carefully compiled, stored, and monitored in accordance with EUR and AVG guidelines. Translation into works made accessible to the public involves anonymising the data.

Use of your personal data

The use of your personal data is limited to the following purposes:

- To contact you, we've used some of your personal data. This data includes your first name, surname, the organisation you work for (at the time), your position and your e-mail address.
- This data can also be used to share the results of the research with you.

All your personal data is stored securely. Some of the personal data you provide to us may be useful for educational purposes and for future research, including in other research areas. Therefore, we ask you to give your consent in the consent form so that we may be able to use the data again for follow-up or other scientific research.

Who can see your interview data?

- All your interview data is stored securely.
- Only persons involved in the research can see (some of) the data.
- Recordings are transcribed. Your name is replaced with a number.
- An article about the results of the study will be published (publicly share the results) in (academic) journals and/or books. The results will be accessible to anyone.
- Some of your specific answers can be used in this article. If your answer can be traced to you or your name would like to be mentioned, permission will be asked first.

What happens after the research?

In accordance with the FAIR principles[1] of the Dutch Code of Conduct for Scientific Integrity 2018, the information is public and accessible as much as possible and will remain confidential to the extent necessary.

Your (personal) data will be kept in a secure location for at least ten years after publication (public sharing of results). The data is stored, so that other researchers have the opportunity to check whether the research was carried out correctly (i.e., "open science"). In this data storage, your personal data are anonymous or in pseudonym (not directly traceable to you). These form part of the Data Management Plan that is part of the design and conduct of research within and around the EUR.

What happens with the results of the study?

The knowledge gained from this research will be shared with you and the BWLs community. Every participant will receive a summary of the results. This will be done by e-mail. You can indicate whether you want to receive the results, and you will be contacted via the contact details you provide for this purpose.

The research results may (also) be shared more widely, for example through publications or data repositories.

Withdrawing permission to use your data

You will be given the option to consent to participate in the study at the end of this document. You may withdraw your consent to participate. If you decide to withdraw your consent, further use of your personal data will stop. Your personal data already further processed in the final result that is published (the public sharing of the results) cannot be deleted. This (personal) data will then only be saved so that the integrity of the research can be tested (see 'What happens after the research?').

To withdraw your consent, please contact me. You can find my details under 'Do you have questions about the study?'.

Do you have questions about the study?

[1] *See the GoFair website: https://www.go-fair.org/fair-principles/*

If you have any questions about the study or your privacy rights, such as accessing, changing, deleting, or updating your data, please contact me.

Name: Seppe Maes
Phone number: +32 4 71 68 09 80
Email: 661582sm@student.eur.nl – seppe.maes00@gmail.com

Ethics approval

This research has been reviewed and approved by an internal review committee of Erasmus University Rotterdam. This committee ensures that research participants are protected. If you would like to know more about this RERC/IRB, please contact ethics@eur.nl.

Declaration of Consent

I have read the information letter. I understand what the study is about and what data will be collected from me. I was able to ask questions as well. My questions were adequately answered. I know that I am allowed to stop at any time.

By signing this form, I

1. consent to participate in this research.
2. consent to the use of my personal data;
3. confirm that I am at least 18 years old[2].
4. understand that participating in this research is completely voluntary and that I can stop at any time; and
5. understand that my data will be anonymised for publication, educational purposes, and further research.

Consent

In the square box, indicate whether you consent to the following information(s). You can do this in two ways. Option 1 is by printing this form and returning it signed. Option 2 is by entering "yes" or not "no" in the square and digitally entering your name and surname or signature below.

Personal data
I consent to the collection, use and storage of my special personal data for answering the research question, namely health, political views, religious beliefs and ideological convictions: Yes /No

Audio recording
I consent to the interview being audio recorded. Yes /No

Sharing of data outside the EEA
I consent to the sharing of my data with the Bioregional Weaving Collective (BWL) and the Erasmus University Rotterdam. Yes /No

Use for educational purposes and further research
I hereby consent to have my personal data stored and used for educational purposes and for future research, also in other areas of research than this research. Yes /No

New research
I give permission to be contacted again for new research. Yes /No

Name of participant:

Participant's signature: **Date:**

You will receive a copy of the complete information and consent form.

[2] GDPR permits 16 years old in the EEA to consent. From an ethics perspective, holding on to the age people become an adult may be preferable. Different countries may handle a different age for becoming an adult.

Appendix I: Table of quotes

Aggregate Dimensions	Second-order concepts	First-order concepts	Quotes
Enhance Comprehensiveness	Elements to display system's influence	Start of with system's context and needs	1. “If you do not understand that context, you cannot understand the decisions that are being made through that.” (Respondent 30) 2. "So the beginning of it is, is what we call as the whole land management definition, where you describe not only the causal loops but what is that, that I am managing here. What is the bioregion about right? Like what are the physical resources there, what are the financial resources slash dynamics, what are the social resources? So to put a good frame of like what you are trying to manage." (Respondent 40)
		Key activities & processes that constitute the BM	1. "And then these are my potential main strategies as we call them forms of production, to go towards our vision. Like, not in detail like work with this guy or do that, but more like. Yeah, let's say, make sure to have an entrepreneurial system in place for involvement of people" (Respondent 40) 2. "How can you work with others to go about it, et cetera? Like these are, for example, the questions that we're interested in, like how can you connect, can you mobilize, how can you build on efforts et cetera?" (Respondent 46)
		Only with causalities, the change-making journey is understandable	1. "Of course, you have to, you have to somehow explain how these NBSs will make a difference and these causal loops, you of course, you want to bring that into that." (Respondent 45) 2. "So I think we tend to anchor our communication around that concept to help people understand the food system transformation that we're trying to create." (Respondent 41)
		Finish with impact on socio-ecological systems	1. “The most important thing for [name organisation] as a not-for-profit organization is to see what impact a certain solution will bring to a society.” (Respondent 42) 2. "Showing how it's delivering on the four returns or some sort of four returns matrix that says, you know, these are the returns you're going to get. And with both, you know, qualitative and quantitative data on there." (Respondent 41)
	BM meta-models to display system's influence	CLDs with extensive focus on causalities	1. "I worked quite a lot with causal loop diagrams and in the mega giga mapping project we did in the public sector here." (Respondent 41) 2. "Me personally, I very much like, I prefer the causal loop diagram because to me it's much more clear, what it means and what I see than the second one, the flourishing business canvas, because the flourishing business one is very much in your face and it's kind of overwhelming at the first point that you really have to make sense of it for a long time, I feel like, that you really understand it. And with the casual loop, I feel like it's very clear from the beginning." (Respondent 45)

		Brief and concise impact pathways	1. "I think you know at the moment the word framework comes up so many times in so many ways, you know which framework and we've got to have some sort of consistency of which frameworks we're feeding back from the bioregional weaving labs. And at the moment, I would like to put up something maybe like a theory of change" (Respondent 41) 2. "We spent a lot of time as an organization developing a theory of change and I think it was an extremely helpful process for us to sort of figure out exactly what, you know, the kind of outcomes that we want and, you know, like just get real clarity on what we're about" (Respondent 43)
		BM meta-models failing to include all elements	1. "The TEEB methodology, The Economics of Ecosystems and Biodiversity, where you can have some calculation about the outcome, the socioeconomic outcomes of the transition you want to take into account or what you try to achieve" (Respondent 44). 2. "I mean there are different models of course, but we are trying to set a standard to measure impact and to manage it so that you have an independent scorecard on management. (...) Yeah. And that's the scorecard, you know, or the measurement tool, you can also put in a very short box in this. You could put it in the box outcomes, you know." (Respondent 42)
Enhance Comprehensibility	Create clear frameworks	Avoid a mass of words in the model	1. "It's not the redundancy that strikes me, it's, the mass of words, right? It's this load of information that strikes me, but I don't. I don't feel like it's redundant. I just feel like it's a bit too much, maybe." (Respondent 45) 2. " We used to have big documents that had to be sent to us, but and, we know that this is quite a burden and doesn't help very much because we want to be close to the partners and learn constantly and not look back like two years later." (Respondent 46)
		Divide all content over different BM meta-models	1. "But it's not necessarily saying that we only go for one business model in our application and in our funding scope." (Respondent 26) 2. "And because you said that, for example, the flourishing business canvas would be most useful to use towards investors. But don't you think that especially an investor would be very interested in the causal structures and actually see how the impact is going to be created?" (Interviewer) "Yeah. No, definitely. They would also be very interested in that, of course, so I don't know. Do you have to choose between both?" (Respondent 41)
	Consider interindividual differences	Assess a recipient's personal background	1. " I think it's too much, arrows here and there and doesn't really help me personally, but I know that for service designers it's a very useful tool. I know lots of people you know that, especially ones that have been educated and through a sort of service design masters course or something it's their go-to tool". (Respondent 41) 2. "And the one thing that you always do have to keep in mind, is it an impact-driven investor, grant funder or is it impact-first? So the different definitions, also where some organization might define themselves, for example when it's impact-first, it's almost the only metric." (Respondent 26)

		Assess a recipient's personal preference	1. “I know there's a big investor here, for example, an impact investor, who loves a social business canvas. … they like a business canvas for anything that they're going to invest in. So, if I suppose I was going to show them an investable portfolio of things. I could show a very, very simplified business canvas for each of the portfolios that we have in our bioregion because I know that that particular investor likes a business canvas” (Respondent 41) 2. “I was working on a pitch this morning to a particular foundation that's very, focused around carbon measurement and so we'd be speaking to the carbon-saving potential of food growing over time with that funder. Another funder might be more interested in the health metrics, you know, the positive impact on mental health over time. So I think often when you're looking for funding, it's about adapting your metrics to sort of not exactly to suit the funder, but certainly to suit the pitch” (Respondent 43)
Enhance both Comprehensiveness & Comprehensibility	Determine your aim	Open the mindset of social entrepreneurs	1. "One scenario is that, let's say if you are in the relatively beginning journey of your entrepreneurship or system changing and everything, then they really help for you to see what your assumptions and what your thinking is or how basically limited it may be and things like that. So, to clarify, to open up your mind." (Respondent 40) 2. "We use the social business canvas fundamentally to help them understand their, I mean, they're in really, really early stage and people who come in, who maybe not even see themselves as a business person and they come in and we start helping them to sort of sort out where their social enterprise might lie and I am a big proponent of using it as a place to come back to as a way to support their development because we use it every week as a support player, they come in and we look at, you know, where are your customers or not, they're not customers, usually beneficiaries, where your beneficiaries are, what is your value? What do you do with your profit? (...) And for us, because it's a weekly coaching kind of setting, it works really well. (Respondent 41)
		Develop the strategic thinking of businesses	1. "The mind map, the loop diagram, is more of an informal brainstorming." (Respondent 42) 2. "It's just because it's a discussion tool I would never use it for anything else apart from that. So that's what it is to me. It's a canvas to keep continuously developing rather than say, here's a dense or a summarized version, because it's just a tool to help remember that we haven't spoken about the relevance between our goals and our cost to whatever today and, so yeah, it looks pretty dense the way it's presented now, but then this would have been the output from many co-created inputs" (Respondent 41)

		Create a common language in a team	1. "In a bioregion core team you usually don't sit as five experienced project manager who have been working in wherever. You have very different experience levels and very different perspectives, very different life journeys. And there this kind of models become very useful again to communicate clearly complex and multidimensional processes, ideas, structures and so on in a, let's say, simplified version basically." (Respondent 40) 2. "I feel like communication is key when it comes to these to these collaborations and everything that facilitates, that can facilitate, presenting and communicating ideas that might be difficult to understand is, of course very helpful in processes like these." (Respondent 45)
		Convince social investors for funding	1. "If you do it like this, we need so much money. We're going to spend it this way on that. It's just not existent. Every now and then they invite me for inspirational dinners from Ashoka. I'm not coming anymore. I don't need extra … being extra inspired. I need a plan. Give me a plan. Give me a plan. Give me a pitch plan. Give me an idea. Give me numbers. Then I can think about it." (Respondent 03) 2. "You know, in a good pitch deck, you also see who the competitors are and what the USP is and everything (...) I prefer also to know where you have challenges, issues, problems, to see whether it's the money you need or whether you need support on an activity or something which you are not good at in your business yet because you don't have the money and the people to solve the challenge you know. Very often I get too many pitches that people think that if they get a lot of money that they can solve everything" (Respondent 42)
	Explore institutional differences	Weavers rely primarily on networking	1. "I came to Sweden as a social entrepreneur with already existing solutions in my bag, …, so we already had tools that were started to be designed before Sweden. So in my case, it was OK let's look at the reality and OK, we have some tools available. We have our skills, we have the capacity as it is." (Respondent 40). 2. "The amount of expertise of anyone that's working in those areas, I think is just something we have to respect enormously. You know, any farmer, they know so much and I think we just got to bow down and respect how much they already understand of NBSs" (Respondent 41).
		Social investors want BM meta-models	1. "But if you look from the investor perspective… we are professionals, so we like to think in the professional way." (Respondent 03) 2. "Because I feel like many, many stakeholders that are involved in funding and in politics and in that kind of stuff, in the organizational stuff. Maybe I feel like they are more inclined to look for certain buzzwords and they are more inclined to value the way things are framed. And I feel like the flourishing business canvas is more useful for this stuff." (Respondent 45)

		Social Entrepreneurs can include storytelling	1. "I mean we do a lot for our general beneficiaries, we're communicating via you know our TV programs and podcasts and websites and various other, you know, online courses and content and so on. " (Respondent 43) 2. "I tell stories. Because people can remember a story, not maybe for the full 100%, but they remember the context and say, OK, this was the clue and then if they remind themselves that it is not only a story. (...) And so telling stories helps people. Firstly, to have their attention longer, but also to remember it when they have to, yeah, disseminate the story further and that's then they become weavers of course." (Respondent 44)