NURTURING ORGANIZATIONAL RESILIENCE?

The impact of strategic sustainable development on the adaptive capacity of organizations

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Abstract: This research explores how strategic sustainable development (SSD) using the Framework for Strategic Sustainable Development (FSSD) might influence the resilience of organizations, using the lens of adaptive capacity (AC). The topic was addressed by researching how practices informed by the FSSD are experienced in relation to fostering organizations' AC. Data was gathered through interviews and a focus group with FSSD practitioners and interviews with sustainability champions applying the FSSD inside organizations. The findings show that the FSSD has the potential to foster AC in organizations, although it isn't designed for it. Especially the systems perspective and backcasting from principles, which are core to the FSSD, proofed helpful. However, the data shows that there are conditions to foster AC through SSD. Important is a long-term, iterative use of the FSSD, as well as the human-centered aspects of facilitation and leadership. The existing culture of organizations showed to be critical as well. There are further implications that render the FSSD's potential as an organizational development tool. An opportunity lies in understanding organizations from a social systems perspective and in using the complexity science behind it to stress this viewpoint in practice, both strengthening resilience and the sustainability practice.

Keywords: Organizations, Adaptive Capacity, Resilience, Social Systems, Strategic Sustainable Development, Framework for Strategic Sustainable Development

Statement of contribution

What a beautiful, learningful journey of three strong and curious women who came together to ask difficult questions and let their process take shape in times of global turmoil and lockdowns! A story that recites the universal truth that nothing comes as it is planned, leading to places where one is supposed to be once giving in.

Throughout the research project, all team members have contributed to the research to the best of their abilities, all being to some extent involved in all steps of the process and contributing to all main decisions. The journey started with an elongated struggle to find our final research topic, originating from our shared sense of the need for more meaningful, healthy workplaces. The first months, we explored and got inspired by Frederic Laloux' work, the topic of teal organizations, living systems and the nature of organizational purpose. This led us to the comparatively more pragmatic focus on SSD and adaptive capacity (AC) of organizations. The design was created and revised by all of us following the iterative nature of our approach. The data was gathered in a collective manner: next to sharing the workload of the literature review, all of us interviewed, facilitated, transcribed and coded throughout the different research phases. Everyone had the chance to learn, expand their comfort zones and explore their strengths. The three of us have been writing and reviewing. Sophie played on her strength producing content from scratch and Ellen on hers in reviewing and polishing the text, taking care of all referencing. Patrizzia's role in the writing was of high importance considering her critical comments on clarity, content and flow and taking care of the formatting and graphs. Presentations were prepared and held together. All three of us prepared and facilitated the diverse content and tribe meetings of our team. Ellen was the head of organizing on the documentation and communication side, yet all followed up on emails with interviewees when necessary.

Ellen is the light of our team and president of the world. Her questioning mind always brought us good discussions about the topic and how we are developing the process. During the research project, she played on her strengths in organizing the group and polishing texts, making sure that we stay in the frame of the helpful. Ellen fiercely jumps into the struggle of living up her own boundaries and was the one who was slowing down when needed, inspiring the team to take rests. She is very considerate about her actions and reminded us of taking care of our own health and aspirations. This strong woman dares to challenge the status quo of the automatic mechanisms from the paradigm we are born in.

Sophie put a lot of thought into the topic and her role. Overfloating with passion and ideas, her eagerness to share had to be channeled by the team and led to the final topic. She has a natural ability to observe things systemically and is a master in the art of painting with words. Her writing skills brought beauty, clearness and precision to our research and her leadership supported us to create the space in and around our study. Throughout the process, Sophie practiced being vulnerable and opening up about her fears and aspirations, inviting the team to be fully present and holding herself accountable if she failed to do so. Over the process, Sophie made progress in understanding the different paces in teams, and finding a sweet spot that balances thinking and acting ahead while honoring and adapting to the boundaries of others.

Patrizzia, a deeply loving and caring human being, enriched the process with her quenchless thirst for learning and powerful motivation to contribute. Sharing her stories and experiences, as well as her struggles provided us fertile soil to step beyond our comfort zones and grow from and with each other. Patrizzia was always bringing in a critical voice that asked for more

clarification when the others expected too early that a shared mental model already had been created. As a true wholehearted person, she helped us to see the capacities in ourselves, also by taking on tasks she never did before. Her inquietude and curiosity about humans and nature brought us to deep discussions on the topic, as she shared new angles during our exploration journey. The dragon dreamer added to the beauty of the tangible outcomes as a master of format.

As a team, one of our biggest achievements was the establishment of a team culture which is fostering trust, marble by marble, and enabled us to create a safe space to share honestly and deeply. From the beginning, the three of us have been taking care of the team dynamics and putting space and effort into it. Our group developed our own rituals, mechanisms and ground rules and we found ourselves revisiting the elements of our research in our own little organization. The most nourishing times were spent in nature, cruising to tribe trips into the forest or to Sophie's parents with 't Wijf aka The Beauty, Ellen's beloved van. We dared greatly to have difficult conversations, challenging the status quo of our educational and social system and voicing our own, reinforcing triggers several times. We practiced being compassionate with ourselves and with each other, especially in the time of the COVID-19 pandemic. A lot of energy went into finding a way to align our different natural paces of work, which is still a bit of a mystery for all of us. In retrospective, we have been learning a lot and see how we grew and healed throughout the process, both as a team and as individuals, as we created the space to do so. Over the course of this research project, we moved towards being able to adapt the process so that it leaves space for everyone's needs while still creating meaningful outcomes and learnings.

The biggest challenge throughout the journey: an educational system that doesn't even realize how it creates structural obstacles to health, competence, meaning-making, influence and impartiality by creating an artificial scarcity of time, which in the end did not allow us to live up to the value of our topic. The state of world during our research, facing a global pandemic, sharpened our awareness of this reality as we became witnesses of the different developments and approaches of our home countries and went together through times of quarantine and spatial distance.

For sure, this is not the end of our journeys as we will take deep inspiration from the past months into our futures.

Charrois, Sophie

Decoodt, Ellen

Rocha, Patrizzia

Acknowledgements

Above all, we would like to thank our interview partners and the organizations that so willingly opened up their (digital) doors and shared many enriching stories and experiences. We are very grateful for the willingness to contribute and inspired by the courage out there to step into practice and also, to question approaches and find one's own language on the journey towards sustainability land. Writing a thesis on resilience in the midst of a global crisis highlighted the importance of our topic and raised our awareness on the important impact we might have by just asking powerful questions to the right people. How could their sustainability practice be a door opener to "pop out their heads out at the other side of the funnel"?

We could say that, from a team-perspective we are grateful for the contagious virus-situation the world is currently in: COVID-19 gave our MSLS journey a whole new sense of dancing with complexity and made us face and overcome several challenges like physical distancing and of course learnings. It also opened doors to several beautiful memories, like a road trip to Germany which was meant to be a conference participation but ended up in staying with Sophie's family in the midst of nowhere. A huge thank you therefore also goes to the parents, grandparents, aunts and uncles of Sophie who welcomed us with great hospitality and hand-knitted socks. Of course, we also thank Ellen's big beauty 't Wijf, the van that carried us to the most enchanting places.

We also want to acknowledge our team and team spirit itself, for dancing through these uncertain times with a lot of grace and dedication to our own sanity, yet with the willingness to have difficult conversations in order to find out that in the end we're striving for the same, just using different paces and languages. Not to forget, our black mas-cat Minou!

Furthermore, without the outlines of such a courageous, empowering and transformative program like MSLS, this team would have never stepped together, and we would have never been able to verbalize the insights that our research touches upon. A thank you from the deepest of our hearts therefore goes to all the generations of MSLS staff (or: our Karlskrona ancestors) who shaped the program, and especially to Tita and Bekki for offering their valuable time and opinion to make our work more science-proof. You encouraged us to find our own way and we were really lucky to enjoy your guidance!

Last but not least, and probably most essential (next to the living systems theories that came across our ways, thank you Frederic Laloux and Margaret Wheatley for the deep inspiration): we want to acknowledge the importance of our communities and networks, of our friends and families. You are our backbone and without you, there would be no us.

Executive summary

Purpose and relevance of this research

This research was undertaken to develop an initial understanding of how strategic sustainable development (SSD) guided by the Framework for Strategic Sustainable Development (FSSD) might influence the adaptive capacity (AC) and thereby the resilience of organizations. Being a pioneering study in the field that connect those topics, the purpose of this research was to explore possible relationships between SSD and AC from a social-systemic perspective, together with people who are directly involved in the sustainability journeys of organizations.

Introduction

Climate change, drastic biodiversity decline, poverty, inequality, and mass migration are only some examples of the sustainability challenge: over the past decades, humanity is moving the socio-ecological system closer to its boundaries. The sustenance of life on Earth is at stake. (IPCC 2014; World Bank 2020) According to the World Bank, "the achievement of sustained and equitable development remains the greatest challenge facing the human race" (World Bank 1992, 1). Taking a systemic stance at the sustainability challenge, the complexity and interconnectedness of root causes and effects becomes clear, as the concerned systems interact and behave in complex, non-linear ways (Andersson 2014). The social and environmental issues humanity is facing are as intertwined as the ecological and social system, making the sustainability challenge a wicked problem with many hidden determinants (Pryshlakivsky and Searcy 2013).

The scientific discussion has arrived at the conclusion that the design and structure of social systems are key drivers of humanity's contributions to the sustainability challenge (Robèrt et al. 2019). Current underlying social structures and mindsets result in an increasing number of paradoxes and collective pathologies: our societal design aims at addressing our fundamental human needs, but often fails or even worsens both societal and environmental system states (Max-Neef 1991). To address this challenge, action needs to be undertaken by all players in society. Literature states that "re-design towards sustainable practices happens in the creative tension field between social and ecological sustainability, and cooperation to safeguard natural systems relies on viable social systems" (Missimer, Robèrt, and Broman 2017a, 34). In other words, it is relevant to better understand the ways in which humanity behaves and organizes. Having a closer look at society, the nowadays prevalent subsystems are organizations (Jonker 2000). These are the places where individuals come together in many different ways under a common purpose, joining forces to enable more than they could achieve on their own (Wheatley and Kellner-Rogers 1998). Jonker (2000) describes them as the glue of society, acknowledging their role in the larger system. Talking about the sustainability challenge, Jonker concludes that "what really seems to be required is change in the way of thinking about organizations and their role in society." (2000, 744) Striving towards a more sustainable world will require to critically examine how we are working together in organizations and which activities we follow.

A social systems approach has recently gained popularity, addressing the complexity of human interactions (Törnberg 2011; Nowotny 2005 as cited in: Missimer, Robèrt, and Broman 2017a), which has also been observed as a development in the management sciences regarding the organizational context (Vancouver 1996; Ackoff 2006; Cezarino, Junior, and Correa 2012). One stream of literature sees social systems as complex adaptive systems (CAS) (Clayton and

Radcliffe 1996). This approach renders dynamic networks of relationships with changing collective and individual behavior (Miller and Page 2007; Castellani and Hafferty 2009). Furthermore, this perspective acknowledges the non-linear interactions and connectivity between social agents in order to understand the bigger whole (Andersson 2014) and the increasing complexity as humanity develops (Scoones et al. 2007). Complex adaptive social systems (CASS) are nested on multiple levels: from families to organizations to communities and society as a whole (Missimer, Robèrt, and Broman 2017a). Considering organizations as CASS showcases the interconnection between the people they consist of, society and the Earth system (Miller and Page 2007). Acknowledging these dynamics can help to understand how organizations can sustain in a complex environment of rapid transformations causing critical challenges. Flexibility and adaptation are considered as necessary capacities to leap back or leap forward in order to maintain the systems functions.

The concept of resilience describes how a system reacts in the face of shocks or change. The concept thereby describes two abilities: the one to absorb and shape changes and the ability for renewal and transformation (Berkes et al. 2003; Folke et al. 2005; Folke 2006; Nelson et al. 2007 as cited in: Missimer, Robèrt, and Broman 2017a; Wahl 2016). Brunckhorst (2002) and Wahl (2016) highlight the scale-linking nature of resilience, which is related to the interconnectedness of the observed systems. What stands out is that, in organizational contexts, resilience is of utmost importance to be able to proactively embark on changes in order to navigate in complexity and to move towards or even beyond sustainability. Being resilient as an organization means to be able to adapt to the unpredictable effects of possible shocks like the unraveling environmental and social crises (Linnenluecke and Griffiths 2010). Social systems' ability to foster resilience has been referred to as adaptive capacity (AC). Missimer et al. define AC as "the key feature that allows complex systems to continue despite the constant change and uncertainty within them and in their environment" (2017a, 36). The five elements of AC that contribute to resilient system states are trust, learning, diversity, self-organization and common meaning (Missimer, Robèrt, and Broman 2017a). Therefore, it is of interest for organizations to understand how to foster these elements. If they are well developed, a social system can more easily adhere to the conditions of the external environment, being able to adapt as a learning organism (Missimer, Robèrt, and Broman 2017b).

Over the past century, organizations have increasingly furthered humanity's development. Looking at the increasing urgency to address the sustainability challenge, they hold an important key for a reconciliation with the natural world (Shrivastava 2014). Practicing sustainable development thereby can take different shapes. There are many concepts, tools and methods with different perspectives on the topic, many being highly context specific and not strategic in nature (Spaiser et al. 2017; Robèrt et al. 2002). Over the past decades, new frameworks have been developed to approach organizations' sustainability journey more strategically and from a whole systems perspective. In practice, conducting strategic sustainable development (SSD) also means to find a unique path for the organization towards sustainability (Robèrt et al. 2019). This can be a journey full of change and transformation. Olsson et al. (2014) describe this transformation as fundamental change, which in the context of sustainability, involves value, belief and behavior shifts, as well as new forms of governance and management. Robèrt et al. highlight that strategic sustainability journeys of organizations require "management tools and practices that help shift an organization's paradigms, mindsets, goals, rules, structures, […] that empowers organizations and their employees to create change." (2019, 138) The practice around the Framework for Strategic Sustainable

Development (FSSD) proved successful in several cases and has been examined in the context of this study (Broman and Robèrt 2017; Harel et al. 2013; Smith and Jarisch 2019).

The importance of resilience and AC of organizations is undeniable, considering their complex environments and their role in the sustainability challenge. Yet, SSD in organizational contexts often focuses on tangible outcomes rather than the processes or transformational journeys many organizations embark on. There is a clear gap in exploring the contribution and potential of SSD in fostering the AC of organizations, both as unintended and intended consequences. This thesis aims to address this gap in an exploratory way. The main research question "*How can practicing Strategic Sustainable Development using the FSSD nurture the resilience of organizations?"* thereby was researched by diving deeper into the current sustainability practice of organizations using the FSSD (SRQ A), by gaining insights on how this practice has been experienced in relation to fostering AC in organizations (SRQ B) and by looking for possible levers for doing so (SRQ C). The scope of this research was organizations that practice SSD using the FSSD within a working context. Consequently, the intended audience consists of FSSD practitioners and organizations using the FSSD, as well as the academic field concerned with resilience of organizations.

Research design and methods

This research has an exploratory nature. The design of it was inspired by Maxwell's (2013) concept of interactive research, where all phases of the research influence each other in a continuous, developmental process. The conceptual framework at the core of this study is the CAS perspective on organizations as introduced by the FSSD, focusing on the concepts of AC and resilience.

A combination of qualitative research methods was chosen to address three sub-research questions (SRQs) as explicitly as possible. The methods include 14 semi-structured interviews and a digital focus group which proceeded in three research phases. In the first phase, the researchers inquired an outside-in perspective, sampling a diverse group of FSSD practitioners (P) and phase 2 explored the inside perspective of sustainability champions (S) within organizations. Phase 3 rounded up the insights with a digital focus group on potential levers of SSD to foster the AC of organizations. The discussion took place between six of the seven practitioners that already joined phase 1.

All data was coded using the five elements of AC as categories. Additional categories were added during the analysis to highlight reoccurring topics and their relation. The derived insights then were tied together in a holistic discussion of the main research question.

Results

The results part of this thesis follows the three SRQs. The data addressing SRQ A and B interweaves the insights from phase 1 (outside-in perspective) and phase 2 (inside perspective), being rounded up by the results from phase 3. Practitioners contributed with fundamental insights. In general, the contributions of the organizations practicing SSD on a longer term were richer and deeper in nature than the ones from the organizations practicing between 0-5 years.

Diving into the current application of the FSSD in organizational contexts (SRQ A), a main finding is that a successful sustainability practice seems to be related to an adaptation to organizational context, a long-term, iterative approach, an empowering and encouraging culture

and committed leadership. In several cases, the sustainability practice shaped a learning culture in the organization. The participants reflected on their use of the different framework elements and how some are mainly used to facilitate and design processes while others are used on the surface, e.g. the systems perspective, the SPs and the ABCD procedure. The need of complementation with other tools stood out clearly, especially on the human-centered side.

When inquiring the relationship between practicing SSD using the FSSD and the AC of an organization (SRQ B), it became clear that building AC is not considered as a direct objective of SSD. Nevertheless, many practitioners organically integrated the topic in their general reflections on organizational resilience and sustainable development. The results showed that some elements of AC have more potential to be fostered through SSD than others. Especially the elements of trust, common meaning and learning were stressed to be supported by SSD, yet a general number of preconditions like leadership and culture, participatory processes and long-term practice were stated several times. Some participants reflected on the opportunity to design more resilient systems when going through the SSD procedure.

The focus group contributed with potential levers to foster AC (SRQ C) through SSD. Practitioners mainly reflected on the topics of leadership, organizational development and governance, social systems, and sustainability competence building. Questions related to these topics guided the conversation but participants in general freely built up on each other's comments. Several insights were derived to round up the data set and feed into a holistic discussion of the MRQ.

Discussion and conclusion

Resilience currently appears as a buzzword, also in the sustainability debate (e.g. Laurent 2018) and the scientific background of the FSSD allows addressing this topic from a systemic perspective. It can help to powerfully distinct and show the interrelations between sustainability and resilience. Zooming in on the application in practice, the FSSD is not explicitly designed to foster the adaptive capacity and thereby the resilience of organizations but has been found to have the potential to do so in multiple ways.

In general, the researchers observed that the elements of systems thinking and backcasting support social agents in organizations to identify the complexity of the sustainability challenge and integrate themselves as part of the wider systems. They learn to respond and even take proactive measures, what reduces their vulnerability to unexpected risks. Especially the strategic elements of the FSSD showed to foster AC: the FSSD can be seen as a decision-making tool that points out a unique "right direction" for the organization, being framed by universal, scientific boundary conditions while considering the flexibility of chosen platforms.

Reflected through the lens of AC, it stood out that the elements trust, common meaning and learning had a higher, more visible potential to be fostered by SSD in comparison to diversity and self-organization. This indicates the opportunity of a more explicit use of the social systems perspective in a sustainability practice. Being added fairly recently, the lack of this perspective is visible in the incoherent use of the FSSD's social side in practice and the lacking understanding of organizations as social systems. Looking at the experiences of practitioners and sustainability champions, there were some reoccurring conditions like committed and empowering leadership, an open culture and integration and adaptation of the sustainability practice to the specific context over the longer term. When practiced in an iterative manner, the participants were able to draw clear relationships between SSD and the AC elements.

What stood out: a progressive organizational culture as fertile soil for change seems to be a condition for both successfully practicing SSD and fostering the resilience of an organization. But what if the soil is not ready yet? What if the seeds the FSSD sows are not planted deep enough or cannot make it without fertilizer? The results confirmed that practicing SSD has the potential to shape the culture and mindset as seen in well-known case studies (Harel et al. 2013; Smith and Jarisch 2019) and it might also manifest in the governance of an organization. If the FSSD is seen in the light of an organizational development tool, what would that mean? How can this be reflected through the SSPs or the elements of AC? The researchers see a big potential in using the CASS perspective to inspire a wider discussion on organizational development and leadership backed up by the recent scientific developments. Increasing the accessibility and applying a social systems perspective might be one key to regenerate the soil. The role of practitioners thereby can be to comprehend the seeds well and bring in the right, human-centered fertilizers for the process.

The human-centeredness of a sustainability practice adds complexity, fragility and uncertainty. Yet, it also unfolds the intangible potential of transformation and development as organizations go through change processes. The role of leadership commitment and the empowerment of employees in a participatory culture was stated several times, both for successful sustainability journeys, and to foster AC and resilience. The role of facilitators as catalyzers, and leaders as role-models stand out clearly, yet even the experts lack courage and guidance to address the topic of social system functions and change from a similar perspective as the environmental ones. Being more explicit about the scientific background empowers leaders and could be fruitful for both, fostering sustainability and resilience through SSD.

The current crisis state of the world, namely the COVID-19 pandemic, showcases the low resilience of several organizations at this moment of history: the shock equaled an existential crisis for many corporations and the economy as such (United Nations 2020; Farrer 2020; Goyal 2020). There are signs that organizations that are known or listed for their sustainability efforts survive with ease or even thrive (Murray 2020), an observation that could proof the findings of this project. Next to this shock, the increasing complexity and urgency of the sustainability challenge indicate that our society and organizations have to become more adaptive while moving towards protecting our system boundaries. This study shows a new potential of SSD as we need AC and resilience to develop in a sustainable direction on the long term. The question here: in this context, is it the role of the FSSD to address resilience and AC more directly?

This research holds a high significance as a pioneering study that aims at relating the SSD and AC by taking a systemic stance at practicing organizations, and therefore showcases the potential to open several discussions in theory and practice. It renders the potential to verbalize the link between sustainability and resilience with an action-oriented and strategic lens. Limitations of the research outcome are related to the scope of the study and the chosen methods. One prominent limitation is the preliminary orientation in one framework, which both informed the conceptual framework and the field of study. Efforts have been made to address the ethical and normative considerations and to reflect on validity concerns.

Glossary

ABCD procedure: A strategic tool for backcasting from Sustainability Principles, designed to promote a four-step process in an organizational context.

Adaptive capacity (AC): The capacity of systems to re-configure and adjust to changes without declining its functionalities over the long run.

Backcasting: A strategic planning concept that starts with the creation of future visions of success and then analyzes what is needed to be done in the current reality to achieve this vision of success in the future.

Common meaning: Human's shared understanding to work towards a purpose and express themselves individually and as a group. Common meaning is considered as one of the five key elements of adaptive capacity.

Complex adaptive system (CAS): A complex system that re-configures its construction and behavior over time to respond to its environment.

Complex adaptive social system (CASS): A social system that behaves as a complex system and that is re-configuring its construction and behavior over time to respond to its environment.

Complex system: A system that is constituted of parts whose behavior is sometimes unpredictable. This is due to the variety of relationships and interactions between its parts and/or its environment.

Conceptual framework: A mental model that allows people to simplify and categorize a complex issue in a way that aids understanding.

Culture: The explicit or implicit behaviors and norms that appears in human relationships and organizations expressed by habits, policies, beliefs, capabilities, of the individuals and their social systems.

Diversity: A quality or state of variety of ideas and responses to a changing environment. Diversity is considered as one of the five key elements of adaptive capacity.

Five-level-model (5LM): A conceptual framework which supports to facilitate processes of analysis, decision-making, and planning in complex systems. It contains the five following levels: system, success, strategic guidelines, actions, tools.

Framework for strategic sustainable development (FSSD): A transdisciplinary framework that builds on a whole-systems perspective to guide the sustainability journeys of organizations. The main elements of this framework are the Five-Level-Model, Sustainability Principles, the funnel metaphor, backcasting and the ABCD procedure.

Funnel metaphor: A concept that explains the idea that the current sustainability challenge is a consequence of misaligning actions with social and ecological boundary conditions. Those misalignments are systematically weakening both the ecological and social systems, tightening the funnel walls.

FSSD practitioner (P): Professional with a minimum of 3 years of experience in facilitating processes in organizations informed by the Framework for Strategic Sustainable Development (FSSD).

Learning: State or act of continuously gaining knowledge and of sensing, and responding to changing environments, individually and together. Learning is considered as one of the five key elements of adaptive capacity.

Organizational culture: Organization's core values and ways of managing and leading that are materialized in its governance practices and its inter-personal and inter-organizational relationships.

Organizations: Group of individuals working towards a common purpose.

Researchers: The authors of this paper: Sophie Charrois, Ellen Decoodt and Patrizzia Rocha.

Participatory process: Process that is based on active participation and involvement of all individuals of a group.

Resilience: The capacity of systems to bounce back and maintain a system state and to leap forward and transform when facing shock or change.

Self-organization: The coordination that arises from the local or internal interactions between individuals without hierarchies, direction and/or control. Self-organization is considered as one of the five key elements of adaptive capacity.

Social sustainability: A state where a system or an organization does not violate any of the five social sustainability principles.

Social system: Social systems are formed by social agents (individuals or groups) that interact and build different forms of relationships.

Socio-ecological system: System composed by the social system and the biosphere and that interact in complex ways.

Strategic sustainable development (SSD): The active, strategic transition from the current globally unsustainable society towards a sustainable society. In an organizational context this also means to find a unique path for the organization to move towards sustainability: moving into a strategic direction that will contribute to positive developments in society and the organization itself while not systemically violating the earth system boundaries.

Structural obstacles: Social constructions (political, economic and cultural) which are firmly established in social systems (organizations, governments, states, societies) and impose difficulties or impossibilities to overcome or avoid by the people exposed to them.

Subsystem: A self-contained system within a larger system.

Sustainability: A state or the ability to eliminate and/or avoid systemic violations to the boundary conditions of the social and ecological system in order to maintain their socio-ecological balance.

Sustainability challenge: The systematic errors of societal design and operation that are driving humans' unsustainable effects on the socio-ecological system, and the obstacles to fixing those errors.

Sustainability champion (S): An individual who takes the lead in transforming an organization towards sustainability.

Sustainability principles (SPs): A set of principles underpinned by scientific laws and knowledge that describe the necessary conditions that must not be violated in order to promote a sustainable society in the biosphere.

Sustainable development: The active transition from the current globally unsustainable society towards a sustainable society.

Systems-thinking: Holistic and organized understanding and study of systems, their constituent parts, their feedbacks, and their behavior as a whole and within the context of larger systems.

Trust: The attitude enabling people to rely on each other and formulate a positive expectation towards one another. Trust is considered as one of the five key elements of adaptive capacity.

List of abbreviations

AC Adaptive Capacity

BTH Blekinge Institute of Technology

CAS Complex Adaptive System

CASS Complex Adaptive Social System

COVID-19 Coronavirus Pandemic of 2019

FSSD Framework for Strategic Sustainable Development

GDPR General Data Protection Regulation

MSLS Master's in Strategic Leadership towards Sustainability

MRQ Main Research Question

NGO Non-Government Organization

O Organization

P FSSD Practitioner

S Sustainability Champion

SDG Sustainable Development Goals

SRQ Sub Research Question

SSD Strategic Sustainable Development

SP Sustainability Principle

SSP Social Sustainability Principle

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1. Introduction

1.1. The sustainability challenge

Humanity has been facing and overcoming critical challenges over the course of history. The challenge of our time is related to a number of ecological and social issues that result from our species' own action in the past century. From climate change, to collapse of biodiversity, poverty, inequality, and mass migration of big parts of the global human population: it is proven that our species is moving the ecological and social system closer to its boundaries every day. The sustenance of life on Earth itself is at stake. (IPCC 2014; Solé, Alonso, and Saldaña 2004; World Bank 2020; Schmidt, Stilz, and Zimmermann 1994) According to the World Bank, "the achievement of sustained and equitable development remains the greatest challenge facing the human race" (World Bank 1992, 1). Ever since acknowledging that humanity actively interferes with the system functions of our planet, scientists have referred to this challenge as the sustainability challenge (Broman and Robèrt 2017).

In order to understand and navigate the complexity of the sustainability challenge it is essential to take a look at the bigger system: planet Earth consists of an ecological system, which nests the social system (see Figure 1.1). Each of these systems have several subsystems which are interconnected and related to one another. They interact and behave in complex ways: cause and effect of actions in the different systems are not characterized by linearity, they differ in time and space which makes the correlations hard to map (Andersson 2014).

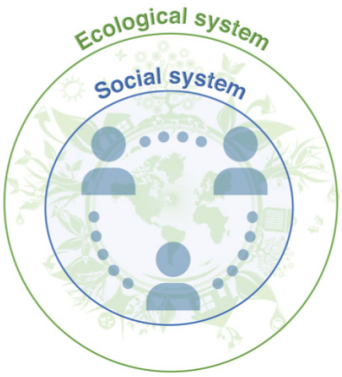

Figure 1.1. The ecological and social system as nested systems.

Since the ecological and social systems are directly linked and nested in each other, it is clear that the ecological and social challenges mentioned before are intertwined and cannot be decoupled from each other. In short: the sustainability challenge is a wicked problem with a high level of complexity and many hidden determinants (Pryshlakivsky and Searcy 2013).

Humanity has exceeded the planet's capacity to regenerate resources in many ways, causing a systematic degradation of the ecological system (W. Steffen et al. 2015; McCartney, Finlayson, and de Silva 2015; WWF 2010). Flows of energy and matter have been manipulated by human interventions and have come to rival. Furthermore, land is excessively used for cities, agriculture and grazing (Ellis and Ramankutty 2008). Climate change is one of the tangible effects that is predicted to threaten the future of life on Earth (IPCC 2014). Scientists started

declaring the sixth great extinction on Earth, observing a drastically increasing loss of biodiversity which challenges the life-sustaining capacity of the whole system (Stork 2010). In society, systemic errors hinder humanity to thrive. Besides inequality, poverty (World Bank 2020) and mass-migration, the violation of human rights, corruption, worker abuse, discrimination and lacking access to education are widespread patterns (Amnesty International 2009; United Nations 2009). What becomes clear: not only our environment but also our social systems are currently under high pressure, being increasingly eroded through structural obstacles (Robèrt et al. 2019; Missimer 2013). In this context, structural obstacles are understood as "social constructions - political, economic and cultural - which are firmly established in society, upheld by those with power (political, economic or other forms), and which are, due to a variety of dependencies, difficult to overcome or avoid by the people exposed to them" (Missimer, Robèrt, and Broman 2017b, 47).

The scientific discussion has arrived at the conclusion that the design and structure of social systems are key drivers of humanity's contribution to the sustainability challenge. Current underlying social structures and mindsets result in an increasing number of paradoxes and collective pathologies: our societal design aims at addressing our fundamental human needs, but more often fails in doing so or even worsens both societal and environmental system states (Max-Neef 1991). Over the past years a general increase of society's awareness of the seriously ill state of social and ecological systems is observable. More institutions grow the awareness that society's mode of operation is inherently unsustainable (Broman and Robèrt 2017) and that this unsustainable course of society cannot be continued indefinitely (Will Steffen et al. 2005). Action has to be undertaken by all players in society as there is a prominent need for sustainable development.

In 1987 the concept of sustainable development was introduced on a global political level through a report of the World Commission on Environment and Development, also known as the Brundtland Report. The report defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their needs" (World Commission on Environment and Development 1987). This definition outlines the human dimension of the sustainability challenge. The focus on human needs as a starting point led towards a shift in understanding the sustainability challenge as both social and ecological. Literature states that "re-design towards sustainable practices happens in the creative tension field between social and ecological sustainability, and cooperation to safeguard natural systems relies on viable social systems." (Missimer, Robèrt, and Broman 2017a, 34) However, the social dimension of sustainability is considered as less developed which has led to an increased focus in academia over the past decade (Missimer, Robèrt, and Broman 2017a). This thesis is diving into the recent developments in the field of social sustainability and strives to contribute by using some of the most acknowledged concepts.

1.2. A society of organizations

As evidenced in the previous section, the fact that humanity's ways of acting and interacting are at the root of the sustainability challenge is well-researched and documented. Therefore, it is relevant to further examine the ways in which humanity behaves and organizes or, with other words: how social systems function.

Having a closer look at the social system, one can observe several further layers of sub-systems that are interconnected in several ways. The nowadays prevalent subsystems in our society are organizations. In this research, they are understood as the place where individuals come together in many different forms and ways under a common purpose (e.g. private-sector businesses, NGOs, governments, etc.). In organizations we meet and co-create every day and they are the spaces where individuals combine their forces in order to enable more than they could achieve on their own (Wheatley and Kellner-Rogers 1998).

Considering the big amount of lifetime spent in organizations worldwide, they have become a second home and the purpose of life itself to many (Thompson 2016; Naber 2020) and they play a fundamental role in shaping society's sense of purpose, common values and beliefs. According to sustainability scientist Jonker (2000), organizations have become the most powerful institutions in our society. This becomes clear in his description of society as a *society of organizations*. He states that there is no longer a life outside the organization, they have become the glue of society. Therefore, it is unavoidable to acknowledge the role they play in shaping the larger social system (Jonker 2000). Jonker concludes that "what really seems to be required is change in the way of thinking about organizations and their role in society." (2000, 744) Striving towards a more sustainable world will require us to critically examine how we are working together in organizations and which activities we undertake. How can we create responsible organizations that understand and thrive in interconnectedness with the environment they are part of? What is an organization's role in the bigger picture?

The impact of the organizational environment and culture on individuals and the health of the organization as a system itself shouldn't be underrated (Aktaş, Çiçek, and Kıyak 2011). The relationships developed in organizations directly impact people's well-being. Intangible 'social contracts' in organizations render what is expected by employees and employers and are often unhealthy as they put high pressure on individuals (Eisenberg et al. 2016). Looking at this social sustainability challenge inside organizations highlights the relevance to examine current organizational environment and cultures from multiple perspectives.

A systemic approach is not the main stream of research in social sciences, but has recently gained popularity, especially in combination with complexity theory (Törnberg 2011; Nowotny 2005 as cited in: Missimer, Robèrt, and Broman 2017a). In the management sciences, scientists have started to apply a systems-oriented perspectives to the organizational context as an answer to the increasing levels of complexity of our world (Vancouver 1996; Ackoff 2006; Cezarino, Junior, and Correa 2012). This thesis takes a social systems perspective to dive into underlying system functions and capacities and to further untangle how organizations as social systems maneuver the complexity of the sustainability challenge. The perspective of organizations as complex adaptive social systems (CASS) using the lens of adaptive capacity (AC) can be seen as a valuable contribution to the current stream of research. This lens can contribute to a better understanding of both, the functioning of organizations, as well as their contribution and relationship to society as a whole. The concepts CASS and AC will be outlined in detail in the following sections.

1.3. A social-systems perspective: organizations as complex adaptive social systems

Literature is characterizing social systems as complex, or more specifically, from a living systems perspective, as complex adaptive systems (CAS). Complex adaptive social systems (CASS) are understood as dynamic networks of relationships between human beings (Miller and Page 2007) with the possibility of mutation or transformation of individual and collective behavior (Clayton and Radcliffe 1996). The so-called social agents, both individuals and groups (Castellani and Hafferty 2009), interact in diverse ways and thereby form CASSs. This perspective helps to perceive the different social systems as nested, and thereby to understand the relationships between subsystems on different scales: from families to organizations, communities and societies (Missimer, Robèrt, and Broman 2017a). From this perspective, organizations appear as nested systems in society, and they interact with each other in complex ways (see Figure 1.2). Organizations can be considered open, living systems, as they affect and are affected by their environment through their permeable, adaptive boundaries (Wheatley and Kellner-Rogers 1998). To understand social systems as CAS provides a perspective that acknowledges the non-linear interactions and connectivity between individuals and enables to derive insights and conclusions about the bigger whole (Andersson 2014). In complex systems, cause and effect are not linear and dependent on context. Small changes and interventions can have large, unpredictable impacts.

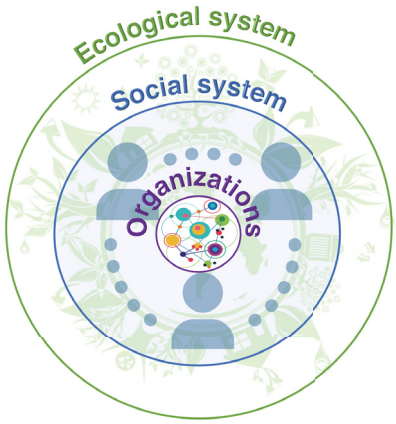

Figure 1.2. Organizations as nested, complex systems in the ecological and social system.

As systems mature, the amount of agents and the numbers and forms of interrelations increase (Clark et al. 1995 as cited in: Missimer, Robèrt, and Broman 2017a; Wahl 2016). This leads to the conclusion that the level of complexity in modern society and its sub-systems is constantly growing, which is influenced by the rate of exchange enabled through technology and globalization (Scoones et al. 2007). Humanity's advances in fields like healthcare, technology, transport, agriculture and arts showcase this development (Senge et al. 2008). This also manifests in an increased complexity of coordinating the different social (sub)systems, what is a common subject in main-stream sociology (Giddens 1990; 1991). Resilience theory and complex and adaptive management are research fields that developed out of the need to better understand and manage the dynamics of CAS with a focus on socio-ecological systems (Berkes et al. 2003; Folke et al. 2005; Nelson et al. 2007 as cited in: Missimer, Robèrt, and Broman 2017a). Despite the differing focus, Wahl (2016) uses this perspective to derive and describe

design approach for thriving human systems and Missimer et al. (2017a) identifies these as the main fields connecting social sustainability and complex adaptive systems, making use of them for the social context.

CAS, and therefore also society and organizations, are understood as subject to uncertainty, change and surprise. Considering organizations as CASS showcases the interconnectedness between organizations, the people they consist of and the wider global society and the Earth system as a whole (Miller and Page 2007). Acknowledging these dynamics can help to understand how organizations can sustain in a complex world of rapid transformations and critical challenges like sustainability. Scientists that have been researching social systems in terms of CASS have identified attributes of flourishing systems states (Missimer 2013). Flexibility and adaptation are necessary capacities to leap back or leap forward in order to maintain system functions. The concepts of resilience and adaptive capacity (AC) are used to describe these phenomena and will be at the core of this research. Both concepts are explored more in detail in the next section.

1.4. Resilience and adaptive capacity of organizations as social systems

The concept of resilience describes equilibrium conditions and is closely linked to the vitality and health of living systems (Wahl 2006). Walker et al. (2004) provide one of the first definitions, describing resilience as "the capacity of a system to absorb disturbance and reorganize while undergoing change, so as to still retain the same function, structure, identity and feedbacks", or in other words how a system reacts in the face of shocks or change. The concept thereby describes two necessary abilities when faced with disruption and change: the ability of maintaining a living system's relative stability and the ability for renewal and transformation (Berkes et al. 2003; Folke et al. 2005; Folke 2006; Nelson et al. 2007 as cited in: Missimer, Robèrt, and Broman 2017a; Wahl 2016). Furthermore, Brunckhorst (2002) and Wahl (2016) highlight the scale-linking nature of resilience, which is related to the interconnectedness of the observed nested systems and which indicates the importance of integration and attention when designing solutions on different levels of society.

Taking this perspective, what stands out is that resilience as described above is of utmost importance in organizational contexts, since it enables to navigate in complexity. It helps to consider the connection with workforces and society in general (Kayes 2015; Daft and Lewin 1993) and to move towards sustainability. "Resilience shifts attention from purely growth and efficiency to needed recovery and flexibility." (Wahl 2016, 107) The academic and systemic understanding of the importance of resilience for organizations is echoed in a rising number of practitioner discussions and frameworks, using concepts like 'lean' or 'agile' as synonyms (Linnenluecke and Griffiths 2010). In the context of this thesis, organizational resilience is used as a concept that describes the capacity of organizations as social systems to bounce back and maintain a system state and to leap forward and transform when facing shock or change.

In the context of the rising complexity of the sustainability challenge, Folke et al. (2002) render four critical factors of society to deal with periods of change and reorganization across temporal and spatial scales; namely learning to live with change and uncertainty, nurturing diversity, learning and creating opportunity for self-organization towards social-ecological sustainability. By condensing this understanding and other existing literature in the field, adaptive capacity (AC) has been derived as a concept that describes a social system's ability to foster and manage

resilience (Missimer, Robèrt, and Broman 2017a). Furthermore, AC is used to describe a social system's functions. Missimer et al. define AC as "the key feature that allows complex systems to continue despite the constant change and uncertainty within them and in their environment" (2017a, 36). They have identified five key elements of AC which contribute to a resilient system state (Missimer, Robèrt, and Broman 2017a): trust, learning, diversity, self-organization and common meaning. The aspects diversity, self-organization and learning are related to the resilience of ecological systems. Trust and common meaning are unique to social systems (Missimer, Robèrt, and Broman 2017b).

The five elements of AC can provide guidance in analyzing the functioning and resilience of an organization, and for moving it towards more resilient states. If the five elements are well developed, a social system can more easily adhere to the conditions of the external environment that frames it, being able to adapt as a learning organism (Missimer, Robèrt, and Broman 2017b). Daft and Lewin (1993) refer to the organizational design itself as a key variable to achieve and manage resilience. Therefore, understanding how to foster the elements of AC internally is of interest in an organizational context. In this thesis, the concept of AC was used as a lens for the analysis of the relation between practicing strategic sustainable development (SSD) and organizational resilience. More details can be found in section (2.2.1).

1.5. Strategic sustainable development in organizations

Over the past century, organizations have increasingly furthered humanity's development on a global level. However, it has to be acknowledged that this development is not inherently good, especially when considering the anthropocentric nature of the sustainability challenge. Organizations' activities and goals, directly and indirectly, impact their environments and the health of the organization as a social system itself (Berns et al. 2009). Furthermore, they both impact and depend on their environment in positive and negative ways. On one hand, many organizations intensively deplete natural resources and ecosystem services, impacting society and the environment as a whole (Senge et al. 2008). On the other hand, the ways in which humans organize can also be seen as an existential key for reconciliation with the natural world (Shrivastava 2014). In short: when we look at the ways we organize and work together from a systemic perspective, we can see the role of organizations in contributing to both, the worsening and the resolution of the sustainability challenge.

As one of the prominent actors in the sustainability challenge, organizations can practice sustainable development in several different ways. There are many concepts, tools and methods that aim to inform how organizations can achieve greater sustainability for themselves and society as a whole. Many approaches show different focus points and diverse perspectives on the topic. A well-known example that is recently applied on the organizational level is the Sustainable Development Goals, developed by the United Nations (United Nations Development Programme 2020). However, a lot of these methods, concepts and tools are highly context specific and not strategic in nature (Spaiser et al. 2017). Over the past decades, new frameworks and approaches have been developed to approach organizations' sustainability journeys from a more strategic and holistic point of view (Robèrt et al. 2002).

Being strategic about sustainable development has been rendered as including a long-term and systemic perspective for the strategic planning of an organization's future. Taking a whole systems perspective which places the organization in the bigger picture of the socio-ecological

system and its boundaries, aims to inform well-reflected, holistic actions and to avoid rebound effects and trade-offs (Broman and Robèrt 2017). This understanding highlights that sustainable development is not the pursue of an organization's sustainability in isolation. One organization alone cannot achieve sustainability for as long as the systems that it relies on are still inherently unsustainable, yet it has the chance to transform its own contributions and inspire change in the wider system. In practice, conducting strategic sustainable development (SSD) also means to find a unique path for the organization towards sustainability, moving into a strategic direction that will contribute to positive developments in society and the organization itself while not systemically violating the earth system boundaries (Robèrt et al. 2019).

It becomes clear that moving ahead towards sustainability can be a journey full of change and transformation. Olsson et al. (2014) describe this transformation as fundamental change, which in the context of sustainability, involves value, belief and behavior shifts, as well as new forms of governance and management. Robèrt et al. highlight that strategic sustainability journeys of organizations require "management tools and practices that help shift an organization's paradigms**,** mindsets, goals, rules, structures, etcetera. […] that empowers organizations and their employees to create change." (2019, 138) Wahl outlines, that in order to thrive within the 'enabling constraints' of the ever-changing, complex socio-ecological system, "the promotion of health and sustainability requires constant learning in order to adapt appropriately to change." (2016, 98) Furthermore, research stressed the importance of support networks and leaders in sustainability-related transformation processes (Westley et al. 2013).

The Framework for Strategic Sustainable Development (FSSD) is one framework that supports sustainable development in a strategic way. It has elements that enable a "more generic, intuitive, and practical approach for supporting sustainable development", providing a frame for decision making and assessment based on science that bridges the gap between short and long-term perspectives (Broman and Robèrt 2017, 20). This scientific framework has been translated and used to guide organizations' sustainable development for many years.

1.6. The framework for strategic sustainable development applied in organizations

The FSSD is considered as a framework with a set of tools, processes and concepts, which in application are adapted to the organizational context and target the development of the organization as a whole. By raising awareness about the sustainability challenge, the FSSD influenced many companies to integrate sustainability into their core business strategies and showed the potential to foster strategic alignment towards sustainability in an economical way (Conrad and Thompson 2013). Over the past thirty years, this transdisciplinary and peer-reviewed framework has been scientifically developed and assessed through practice all around the globe and academic review on a continuous basis:

> The FSSD has proven to aid organizations in thoroughly understanding and putting themselves in context of the global sustainability challenge, and to move themselves strategically towards sustainability, i.e., to stepwise reduce their negative impacts on ecological and social systems at large while strengthening the own organization through capturing of innovation opportunities, including new business models, exploration of new markets and winning of new market shares, and through reduced risks and operation costs. (Broman and Robèrt 2017, 17).

The framework builds on complexity science and systems thinking, approaching the sustainability challenge from a whole-systems-perspective. All major actions taken in relation to SSD therefore should be related to a strategic sustainability perspective which is placing the organization in the context of the socio-ecological system. In this way the FSSD is taking a holistic view. Yet, when it comes to assessing the current reality of an organization, both the external and internal level of sustainability should be assessed. This entails to perceive the organization as a system itself and explore how it functions, looking at things like the relationships between members, organizational culture, ways of working and how they contribute to the capacity of the organization to thrive or violate some of the system conditions. One of the proposed analytical tools, the House Model, is mapping not only the input and output of the organization but also the internal operations and decision-making processes. The FSSD weaves the perspective of CASS, as described above, into the sustainability journey and uses it in tangible ways to open a discussion on governance. (Robèrt et al. 2019)

The element of leadership commitment and the right organizational culture for a successful sustainability practice is addressed in literature (Broman et al. 2017). Sustainability journeys "that are to be successful require a healthy organizational culture that supports on-going dialogue and relationship development" (Robèrt et al. 2019, 129). Robèrt et al. stresses that it often is "best to first explain the FSSD to senior management. When senior executives run the sustainability agenda, the whole organization understands that it is an important strategic issue and acts accordingly." (2019, 62)

The FSSD has several different components which enable a strategic approach to sustainable development. Guidance is provided by a Five-Level Model (5LM) which consists of the following levels: systems, success, strategic guidelines, actions and tools. This model is used to describe the composition of the framework's elements but is also recommended as a tool for structuring and analyzing specific problems, tools and projects (Broman and Robèrt 2017). In practice, the 5LM facilitates structuring, and clarification of relationships and makes the intuitive more explicit. Nevertheless, it is stated that using the model "takes time and energy, and it is not necessarily worth it to make that investment for simple, everyday activities. However, [...] investment that is put into using the 5LM allows a team to make sense of complexity and develop a common purpose" (Robèrt et al. 2019, 36). The following overview of the core elements of the FSSD will be guided by the levels of the 5LM.

On the systems level, the FSSD is describing the sustainability challenge and the involved systems. The FSSD hereby takes a whole-systems perspective as outlined above. By taking a systems' thinking approach, the FSSD allows the user to take a step back and look at the earth system, its boundaries and the flows of its nested and intertwined subsystems. This enables the identification of the own position and the systemic interrelations of actions with the direct and indirect environment. A funnel is hereby used as metaphor. The narrowing of the funnel walls is representing the decline of fundamental socio-ecological system functions, entailing the decreasing space for action as the system is losing fundamental capacities. At the same time, the metaphor also describes how acting sustainably can stabilize the funnel walls or even move the system to restoration, visualized as the widening of the funnel on the other side. The funnel helps to clearly picture the effects of unsustainable action and outlines the opportunities of sustainable development. (Broman and Robèrt 2017)

On the success level, the FSSD is providing a principle-based definition of sustainability as the definition of success. Eight sustainability principles (SPs, see appendix A) thereby describe the

boundary conditions of the socio-ecological system. The principles were scientifically derived from major contributions in several academic fields. They were designed to provide a general yet concrete, sufficient yet necessary and non-overlapping description of the boundary conditions that frame a safe, sustainable space to operate and even thrive. Therefore, they help to strategically plan for sustainable development without unintended consequences. Robèrt et al. (2019) highlight that the SPs are robust, enable structure and a bird's eye perspective for complexity. They avoid reductionism but should not be seen as an alternative to more detailed levels of knowledge. Nevertheless, they are seen as the only principles that are designed to be useful for backcasting planning and redesign for sustainability.

On the strategic level, the FSSD is introducing this concept of backcasting. According to this understanding, the process of sustainable development should start with a general vision of success that describes a desired future outcome. Looking back at the current state from this future vision, the gap between vision and current reality will become clear and will give rise to a creative tension. This tension can leverage the generation of more innovative actions and ways towards the defined vision, helping to detach from the restrictions and problems of the present or past (Broman and Robèrt 2017). The process that applies the backcasting approach in practice is called ABCD. This procedure makes the FSSD applicable for strategic planning towards sustainability in organizations of any kind, following four basic steps (see description in the appendix B).

Robèrt et al. (2019) states that this action-oriented and intuitive procedure is most effective when it is repeated regularly, involves people from many areas of an organization, and is integrated into meetings and routines. Participatory approaches have been found to be most helpful (Broman and Robèrt 2017). Literature describe the FSSD as "science- and logics-based framework [that] aids the dynamics of co-creation processes." (Broman and Robèrt 2017, 27–28) Broman and Robèrt (2017) say it requires and helps to facilitate collaboration across disciplines and sectors, departments and organizations. In organizations, an initial process should be executed with the management of the organization. After setting the tone, it then should be repeated in depth with different groups throughout the whole organization (Robèrt et al. 2019). The ABCD procedure is presented as a linear process on paper, but the FSSD clearly mentions that this is an iterative process in practice. It is also likely that the procedure includes an education program for employees to learn about the FSSD. In addition, supplementary tools, methods, concepts, or other forms of support might be needed. (Broman and Robèrt 2017)

The integrative nature of the framework enables this: at the tools level, the FSSD invites to consider case-specific contexts by complementing it with further tools and methods. Furthermore, the FSSD aims at providing a structure that allows to understand the strengths of this complementary tools and methods and that aids a coordinated use of them. This toolbox approach enables to address what is needed to build the capacity for the transition towards sustainability. Examples are management systems or reporting methods. (Broman and Robèrt 2017)

SSD is a continuous practice, as Broman and Robèrt state: "learning the sustainability principles of the FSSD is quite easy, but the FSSD is much more, and becoming a skillful user takes significant effort. Education and training is a key part of the solution." (2017, 28) Furthermore, a conceptual framework like the FSSD is not enough to ensure success: "Success also requires considerable creativity, cooperation, and learning by a diverse group of people within or between organizations." (Robèrt et al. 2019, 34) According to Robèrt et al. (2019), the practice

itself is most effective when it is repeated regularly and the repetition builds the organization's experience working together on sustainability issues. Robert et al. state the following:

> As the organization becomes more experienced 'top-down' and 'bottom-up' processes can begin to support each other in a positive feedback loop. Management transmits clear principles and core values, while employees provide ideas for strategic actions towards sustainability that are based on experience and on-the-ground knowledge. Systematic step-by-step changes align the whole enterprise with the FSSD, including, for example, internal and external communications, management routines, purchasing, product development, energy, transportation, recycling, and packaging. (Robèrt et al. 2019, 63)

A sustainability practice informed by the FSSD aims at transformations on the whole-systems level and has proven to do so in several cases (Robèrt et al. 2019; Harel et al. 2013; Smith and Jarisch 2019). By promoting processes focused on capacity building, the FSSD is fostering systemic changes and aims at transforming an organization from the inside out. Over time, external support from practitioners becomes obsolete as the organization itself gains the knowledge and understanding to apply procedures on different levels of the organization. In that sense, SSD is not only about the actual outcome or solutions, but also about the knowledge on systems thinking, the sustainability challenge and defining sustainability, as well as the participatory processes that are used (Broman and Robèrt 2017). Considering this role of capacity building towards transformation, a relevant question that should be asked is which capacities of organizations are built by SSD? Can it be related to the AC of organizations understood as CASS? And is there a relation between the transformations and AC from a systemic perspective? SSD in organizations that is informed by the FSSD provides the field of study for this research. Furthermore, the FSSD serves as a conceptual framework for this thesis (see section 2.2.1).

1.7. Fostering organizations' resilience and adaptive capacity through strategic sustainable development

When looking at organizations in their complex and uncertain environments, the importance of organizational resilience and AC is undeniable (see section 1.4). Yet, SSD in an organizational context, as well as related research, often focuses on the creation of tangible outcomes and the elimination of system-eroding elements. There is a gap in exploring the processes of SSD and their potential to transform organizations' mindsets and behavior. The contribution and potential of SSD in fostering the AC of organizations, both as unintended and intended consequence, are questions that haven't been raised yet. Scientific literature that directly connects SSD with fostering the AC or resilience of an organization has not been found by the researchers. Therefore, it is claimed to not exist yet, even if these elements are at the core of the social side of the FSSD. Nevertheless, when exploring existing literature on the use of the FSSD in organizations, this literature does address the impact of SSD on resilience, transformations and capacity building. Although this is done in a very indirect, tacit language, it can be related to the five AC elements.

The sustainability journey of Interface (a global commercial flooring company) is framed by the FSSD. The authors of a published reflection on that sustainability journey display the FSSD as a frame that shapes mindset over time, a lens that has been deeply integrated (Harel et al.

2013). The elements of the FSSD trickle into different layers of the company, fundamentally transforming the ways Interface thinks and learns around natural science, systems and strategic thinking, innovation, communication, design with purpose, "and perhaps more than anything – shifting the entire world view of a person" (Harel et al. 2013, 30). The fact that the FSSD is an open source method leads to the development of a sharing spirit: Interface spreads their best practice and increases their level of transparency over the years what also leads to an increasing count of collaborations and projects. Having a safe space and an empowering culture of participatory leadership are clear contributions to the success of the sustainability journey (Harel et al. 2013). The authors even mention resilience:

> The focus on sustainability makes sense from the business perspective; it has brought resiliency to the company and better survival chances. Sustainability has made the company more proactive and equipped to endure turbulence in the market […] Interface's circular economy business model is not only profitable, but also ensures a 'license to exist' in a sustainable world" (Harel et al. 2013, 30).

As depicted by the case of Interface, tangible manifestations of sustainability-related transformations are innovations in products, markets, processes and even in business models which make the organizations 'future-proof' (Broman and Robèrt 2017; Harel et al. 2013).

The contribution of SSD using the FSSD to the AC of organizations is largely missing in existing literature. More specifically trust is considered core by the FSSD, yet no direct contribution of SSD to trust has been stated in the examined literature on FSSD in practice. The element of learning was touched upon by Broman and Robèrt: "experience from working with companies, municipalities and other organizations is that they learn quickly to identify and handle relevant arrays of subsystems." (2017, 25) Looking at diversity, Broman and Robèrt (2017) highlight the role of the science- and logics-based nature of the FSSD in unlocking different perspectives, allowing true differences in values and preferences to become clear. Another element that is stressed by Robèrt et al. is that there should be no limits on creativity in the C step: "all actions that can in some way help close the gap should be listed" (2019, 56), fostering a diversity of ideas. Furthermore, Missimer et al. state that "well thought-through boundary conditions, applied in a participatory manner, allow and encourage groups, organizations and communities to create visions together and cooperate in non-prescriptive manners to work towards the principle-framed visions" (2017b, 44) and thereby render how SSD contributes to self-organization. A similar argument is made by Robèrt et al. (2019). Literature provides another interesting insight from a systemic perspective: if the five elements of AC are well developed, a social system can more easily adhere to the social sustainability principles (Broman and Robèrt 2017).

These limited insights show the potential that lies in addressing questions that relate SSD to resilience and the AC of social systems. This thesis aims to explore some of them and serve as an initial exploration, providing a context for further research. As outlined above, SSD is complex and very case-specific, even if it follows a particular framework like the FSSD. The mix of methods, processes and steps used as well as the timeframe of the application are informed by the organizational context. Therefore, it might be difficult to derive generalizable answers to the questions raised in the context of this research.

1.8. Research scope

At the core of this study is the topic of SSD using FSSD in organizational contexts. Following the definition of organizations as given in the introduction, the scope has been narrowed down on organizations that are considered as workplaces, employing individuals in diverse roles. Due to its exploratory nature and the social-systemic perspective lens, it was not considered necessary to scope down any further. The field of sustainable development is a broad and intangible field. Due the context of the study and the proven impact of a strategic approach to sustainability, the researchers narrowed the field of study down to SSD as proposed by the FSSD. Other forms of sustainable development or SSD were not taken into consideration. The FSSD is applied in many different ways, depending on the facilitation and the need and state of the organization. The focus of this study was informed by the current practice applied in organizations, as stated by interviewed practitioners and sustainability champions.

Although this research aims at studying organizations as whole systems, only interviews with one or two individuals per organizations were conducted. A higher number of participants and organizations could improve and validate the derived insights.

1.9. Research purpose

This research was undertaken to develop an understanding of how applying the FSSD in organizations might influence the AC and thereby the resilience of organizations. The addressed audiences include organizations that are using or plan to use the FSSD for their sustainable development practice. They would gain added value by interpreting the FSSD's potential benefits and challenges through the lens of AC and resilience. Another addressed audience are practitioners using the FSSD in an organizational context and they could gain an increased understanding of the characteristics of the FSSD in the context of organizational development and what could be possible levers. The academic field that is concerned with the topics of resilience and AC of organizations in general is the third audience. This study might be of particular interest for researchers familiar with the FSSD.

1.10. Research questions

To identify how applying the FSSD in organizations might contribute to fostering the AC of those organizations, the following main research question (MRQ) was formulated: *How can practicing SSD using the FSSD nurture the resilience of organizations?* In order to address this question, the researchers derived three sub-questions (see Table 1.1). These guided the research process and aimed at deriving of helpful insights that feed into answering the main research question.

Table 1.1. Sub-questions of this research.

SRQ A: *How is the FSSD currently applied in organizational contexts?*	**Aim**: To gain a better understanding of and insight in the current state of practice, allowing a recent and relevant view on the contribution of SSD using FSSD to organizational resilience.
SRQ B: *Does practicing SSD using the FSSD help to foster the adaptive capacity of organizations? If so, how?*	**Aim**: To analyze the potential contribution of SSD using the FSSD to organizations' AC.
SRQ C: *What are levers to foster the adaptive capacity and resilience of organizations through SSD using the FSSD?*	**Aim**: To derive potential levers for the application of the FSSD that can help to more powerfully foster the AC of organizations. To inspire practitioners to reconsider and adapt their procedures and approaches.

2. Research design and methodology

2.1. Research design

The nature of this research is mainly exploratory, as it is mainly concerned with discovery of open-ended questions that haven't been addressed before (Stebbins 2008). The design of this study was inspired by Maxwell's (2013) concept of interactive research, where all phases of the research influence each other in a continuous, developmental process, enabling adjustments and deeper insights throughout the process. Therefore, the lines between the phases of research are relatively blurry and some of the methods used addressed multiple phases of the design. For the researchers, the value of this approach clearly lies in its flexibility, representing the reflexive nature of research in social sciences and the nonlinear relationships among the components of our design. Maxwell (2013) depicts goals, conceptual frameworks, research questions, methods and validity as the critical elements of an interconnected whole, all simultaneously influencing each other.

2.2. Research approach

2.2.1. Conceptual framework

The FSSD has been guiding this study and is represented on two different levels: both as field of study (this research is focusing on SSD using the FSSD) as well as a framework that provides the conceptual elements to analyze the inquired relationships. The reason for selecting elements of the framework are diverse. It is a transdisciplinary and peer-reviewed framework that has been used and constantly developed in multiple contexts all around the globe. The framework builds on complexity science and systems thinking, approaching the sustainability challenge from a whole-systems-perspective which is also how it has been framed for the purposes of this study. As presented in section 1.6, the FSSD has several different components which enable a strategic approach to sustainable development (Broman and Robèrt 2017).

By taking a systems' thinking approach, the FSSD allows the user to take a step back and look at the Earth system, its boundaries and the flows of its nested and intertwined subsystems, and thereby the own position and interrelations. (Broman and Robèrt 2017) This thesis used the presented systems' perspective, focusing on the understanding of organizations as complex adaptive social system (CASS) and the perspective of adaptive capacity (AC) and resilience (see definition in section 1.4). The reason to use both as conceptual frameworks for this study is related to the lenses they provide: AC as the ability to foster and manage resilience not only gives a clear structure to explore the possible impact of SSD on resilience, it also links the two as the social sustainability principles (SSPs), which are at the core of the FSSD, were derived from AC. These SSPs outline structural obstacles that might erode the AC of a system (Missimer, Robèrt, and Broman 2017a). Resilience as the ability to bounce back or leap forward seems as a valuable frame for a wider discussion, addressing the potential response of organizations to challenges like those in the sustainability context. Resilience thereby also explicitly talks to systemic transformation, which is rendered as one aim of SSD. AC might be helpful to understand how the human-centered elements of the practice help fostering it. The concept of AC and its five key elements are used to describe and analyze resilience at the level

of the whole organization. The five elements are outlined in detail in Table 2.1. Short versions of the definitions that were used with the participants can be found in the appendix C.

Table 2.1. Description of adaptive capacity.

Element of AC	Description
Trust	Trust has been identified as the connecting element that keeps a system together and it is seen as one of the main variables that creates value in social systems. It is referred to as the fabric, which binds society together. Trust can be seen as a quality of connection through which a system can remain together even if there is a high level of internal complexity. Missimer, Robèrt and Broman define trust as "an attitude that enables an agent to cope with situations of uncertainty and lack of control." (2017b, 46) Furthermore, it allows collective adaptation to the constant change that occurs in the complex environment of the system. (Missimer, Robèrt, and Broman 2017a) Trust also enables the other elements of AC. Missimer states that "if trust between various individuals does not exist, it is difficult or impossible to achieve collective learning, diversity and self-organization in a system." (Missimer 2013, 43) Thus, creating trust in a system is considered as a prerequisite for developing and maintaining other elements of AC.
Learning	Learning is an essential element when dealing with constant change. It refers to the ability of learning as an individual and the ability of a system to learn as a whole. It enables a system to sense change, respond and adapt to its environment effectively. (Missimer, Robèrt, and Broman 2017b)
Diversity	Diversity is key to finding successful solutions for adapting in changing environments. Diversity increases the possible reactions and this variety of different responses is necessary in complex contexts where one cannot know or predict what will happen in the future. Input from diverse perspectives contributes to a better understanding of a system and increases the chance that one solution helpfully addresses the problem in case of change or shock (Missimer, Robèrt, and Broman 2017a).
Self-organization	Self-organization describes the phenomenon that interaction between social agents can happen without centralized control. The individuals in the system do show intent, but there is no guidance at the level of the system as a whole (Missimer, Robèrt, and Broman 2017a). In complex environments, quick adaptation is essential. Through self-organization, decisions are made more agile and faster than in top-down hierarchies.
Common meaning	Like trust, common meaning is a unique element in social systems. Humans are a meaning-making and meaning-seeking species (Missimer, Robèrt, and Broman 2017a). Facing a lack of meaning, our brain "signals extreme discomfort and motivates the search for renewed purpose and hence meaning" (Klinger 1998, 33). Therefore, social systems require common meaning and a clear purpose in order to exist and thrive (Missimer, Robèrt and Broman 2017a).

2.2.2. Research flow

The research process was broken down into three phases, each of them addressing the SRQs from different perspectives. The phases were designed to guide the research process and informed the selection of methods and participants, together with the SRQs. The three phases helped to investigate the different links between SSD using the FSSD and the AC and resilience of organizations from an action-oriented perspective. Having three SRQs aimed at enabling a reflection of the MRQ from multiple angles, tying all insights together.

Phase 1 of this research focused on identifying the dynamics and practices of SSD when applying the FSSD in organizations (SRQ A) from an outside-in perspective. Data was gathered through a series of semi-structured interviews with FSSD practitioners, thereby taking the perspective of external observers which to a certain extent interfere and inform the developments in practicing organizations. The aim of this stage was to get clarity on how the FSSD is currently applied in organizational contexts, linking it back to how this practice can help to foster the different elements of AC (SRQ B). Talking to experts, the focus hereby was more on the different elements of the FSSD rather than the practice as such.

In phase 2, the researchers then further zoomed in on SRQ B with a bigger focus on the practice as such and the context in which it happens by interviewing representatives in organizations. The aim was to integrate a perspective from inside the organization, where the developments take place over different timescales. The data gathered complimented the results for SRQ A with current cases of sustainability practice using the FSSD.

Phase 3 addressed a more evaluative question (SRQ C), seeking to gain practice-oriented insights on levers to foster AC in organizations through SSD with the FSSD. Data was gathered through a digital focus-group with the FSSD practitioners from phase 1, rounding the data set for a holistic discussion of the MRQ.

2.3. Research methods

A combination of qualitative research methods was chosen to address the SRQs as explicit as possible. The methods are outlined in Table 2.2. The following paragraphs are structured according to the 3 phases of the study. After elaborating on the need of each phase in relation to the MRQ and the other phases, the chosen research methods for data collection are presented in detail. Another paragraph elaborates on the analysis and synthesis of the data.

2.3.1. Phase 1: outside-in perspective - interviews

The goal of the first phase was to update the understanding of SSD in organizations using the FSSD (SRQ A) and the possible relation of the framework-guided practice on the AC of organizations (SRQ B) from an outside-in perspective. A series of seven semi-structured interviews with FSSD practitioners helped the researchers to derive a well-rounded insight into how the framework is applied in different contexts and the diverse potential to build AC (see results). These insights were feeding into the design of the next research phases and a more holistic discussion of the MRQ. The method was found suitable as the limited time available

Table 2.2. The different methods linked to the different phases of the research

	Research method	**Sample**	**SRQ A**	**SRQ B**	**SRQ C**
Phase 1	Semi-structured interviews	FSSD practitioners	x	x	
Phase 2	Semi-structured interviews	Sustainability champions in organizations	x	x	
Phase 3	Digital focus group	FSSD practitioners			x

could be used with intention, guided by open questions. According to Bryman (2012), semi-structured interviews are an effective option if several interviewers are involved in the process and interviewees are only available for one meeting. The weakness of the method in exploring interviewee's unique perspective was addressed by the interviewers' proactive interaction and request.

The interviewees, entitled as 'FSSD practitioners', 'practitioners' or 'P' were selected following a purposive, mainly opportunistic form of sampling (Bryman 2012). Opportunistic sampling thereby was found helpful to be considerate about the context of participants while making use of opportunities to collect data from certain individuals, that were expected to contribute insights with relevance to the research question. There was a set of criteria that informed the choice, including the use of the FSSD in organizational contexts for over 2 years at the point of contact and experience in working with a variety of organizations. The practice had to be informed by several of the concepts presented by the FSSD. The practitioners were reached and contacted through the alumni network of MSLS. The selected parties matched the criteria and furthermore offered an interesting level of diversity regarding gender, culture, background, age and experience. Descriptions of the interviewed FSSD practitioners can be found in appendix D. The seven interviews, which all lasted between 60 and 90 minutes, were conducted via the online tool Zoom. All interviews were recorded and transcribed, using the tool Otter.ai. Recording and transcribing allows a more thorough and repeated examination of the content (Bryman 2012). The use of an online tool has the benefit of adding another form of real-time documentation, supporting the further processing of the data. This is linked to the cloud-nature of the tool, which enabled the researchers to collaborate efficiently. A downside is the upload of the data on another platform, whose security first had to be secured.

During the interviews, the focus was on the application of the FSSD in practice: the questions asked about the key elements of the FSSD used for SSD in organizations, main insights from applying the framework in organizational contexts and the potential contribution to organizational resilience and the five elements of AC. These elements were introduced to the interviewee by a simplified definition (see appendix C). Additionally, the researchers explored recommendations regarding possible sustainability champions in organization that successfully use the FSSD and might be willing to participate in this research. Examples of interview questions can be found in appendix F.

2.3.2. Phase 2: inside perspective - interviews

The second phase of the research focused on gathering and interpreting data from inside organizations in order to understand how SSD using the FSSD is taking shape in the context where it is practiced and how this can have an impact on organizations' resilience and AC. The methodological choice of semi-structured interviews was informed by the aim of the phase and similar reasons as listed for phase 1. The data gathered complemented the insights of phase 1 and fed directly into the design of the next research phase and discussion of the MRQ.

The data was collected through seven interviews with individuals in leading roles in practicing strategic sustainable development using the FSSD in their organizations. Insights were gathered with small-, medium- and big-size organizations of local and global nature, all being based in Europe (see appendix E) that have been using the FSSD for strategic planning and action for over four months, choosing a typical case sampling approach (Bryman 2012). All the organizations were still working with several elements of the FSSD when participating in the research, ensuring the recency of the contribution. Based on these criteria, the cases represented an interesting diversity in their experience with the FSSD: two of the selected organizations worked with the framework for a short time period (0-2 years), one organization used the framework on the medium term (2-5 years) and three organizations integrated the framework for longer than five years. The researchers acknowledge and profited from the different cultural and organizational contexts that exemplify the variety of uses and context of SSD. The diversity of nature and industries of the selected organizations differ highly and are further described in appendix E.

The connections to the organizations were established through a mixed form of opportunistic and snowball sampling (Bryman 2012): the FSSD practitioners that collaborated in this research and a Swedish network of organizations practicing SSD using the FSSD were actively approached for recommended organizations and interview participants. The interviewees, entitled as 'sustainability champions', or 'S' were contacted and invited to participate in case they met a set of criteria: currently or recently being a leading role in the organization for its sustainable development and a minimum of four months of experience in applying the FSSD. The selection following these criteria offered an interesting level of diversity regarding gender, culture, industry and experience. The researchers conducted a total of seven interviews of 60-minutes via the online tool Zoom. All interviews were recorded and transcribed, using the tool Otter.ai.

The sustainability champions were interviewed following a set of questions about their experience with using the FSSD in their sustainability journey and how they would relate this to the resilience and the AC of the organization. The five core elements were introduced to the interviewees with a simplified definition (see appendix C). The interviews had a stronger focus on the sustainability journey as such, rather than the elements of the FSSD. Examples of interview questions can be found in appendix F.

2.3.3. Phase 3: focus group

Phase 3 addressed a more evaluative question (SRQ C), seeking to gather practice-oriented insights on the levers in SSD to more coherently foster the AC of an organization and to inspire practitioners to reconsider and adapt their procedures. Based on the insights and learnings from the prior stages, the research team designed a semi-structured, digital focus group with six of

the seven interviewed FSSD practitioners from phase 1. The benefits of the method which include a vibrant exchange and free flow of conversation overweighed the weaknesses described in literature, e.g. the higher probability of cultural biases, the time-intense preparation and further processing of the data or the potential loss of control over the discussion (Bryman 2012). Guiding themes were retrieved from the first two phases to guide the conversation and increase the level of control of the facilitators and a certain free development was considered helpful for the purpose of this phase. The researchers aimed at complimenting the data and enriching the discussion with cross-pollinated insights that might relate to the high level of expertise of the participants.

The re-invitation of the practitioners from phase 1 was purposive sampling from a perspective that the participants proofed this expertise in phase 1 and already were familiar with the research and had time to reflect on the topic over the processing of phase 2, which enriched the information shared. The guiding questions were derived from SRQ C in combination with these themes and can be found in appendix F. The flow of the focus group was mainly driven by the interactions of the participants themselves and only slightly guided by the facilitation of the research team. The focus group was conducted via the online tool Zoom and lasted for 90 minutes. It was recorded and transcribed using the online tool Otter.ai. Choosing the digital realm for the focus group was influenced both, by convenience for and availability of the participants who lived in several different countries at the moment of conduction, as well as due to the recommended physical distancing measures during the COVID-19 pandemic. The researches acknowledge that this might have led to a loss of direct interaction and a less organic flow of the discussion.

2.3.4. Analysis and synthesis

After every phase, the different data sources were analyzed using a participatorily designed coding mechanism. The researchers sat together, agreed on the tools in use and derived the process and coding approaches. In phase 1 and 2, this allowed the researchers to identify mainly used elements of the FSSD in organizational contexts and key insights on SSD practices using the FSSD, as well as other relevant topics for the discussion of the MRQ. For this a more inductive way of coding was used. Further codes for the five elements of AC were introduced and used in a more deductive way. All data from phase 1 and 2 was coded by two researchers through the online tool Atlas.ti. The online cloud version of the well-renowned data analysis program proofed of high value for the collaborative coding between the three researchers.

After coding the transcripts, the codes were analyzed for patterns by reviewing them in a joint effort and noting main insights for the results, in clear distinction of the source of information. Phase 1 and two thereby got interwoven for the presentation of results on SRQ A and B. The findings are presented in the results section and informed the design of phase 3.

The transcript of phase 3 was analyzed using an inductive coding mechanism that facilitated a concrete derivation of key insights. This way of coding gave the researchers the opportunity to let the data speak without having a preset lens or mindset when analyzing it. The transcript was coded by two researchers who used color coding, marking reoccurring themes and important contributions with different colors. After coding the transcript, the results were analyzed for connections and patterns and summarized.

After concluding all phases, the researchers came together to derive main insights for the discussion. All findings are presented in the results section and jointly informed the discussion and the conclusion of this thesis.

2.4. Validity

In the context of this qualitative research project, the aspects discussed under the heading validity refer to the trustworthiness, rigor and quality of the findings. All phases had a more exploratory nature. It has to be mentioned that the concept of AC of a social system, which was brought in all phases, is still relatively unexplored, and this is a pioneering study diving into the influence of SSD using FSSD on the resilience and AC of an organization. The iterative, multiple-phase approach guaranteed that the topic was explored from multiple viewpoints which, in the analysis and discussion, were held against and complemented each other and offered a more holistic insight.

The ability of the researchers to address the topic has been considered, particularly regarding the scope of the research. The role of the researchers and their positionality had been reflected upon throughout the process. As the selected methods built on human interaction, there was a risk that answers were influenced and guided to a certain extent, even though this research was conducted with attention and care.

Answers to interview questions related to SRQ A did not always address the same element. This was not the intention as the understanding of SSD using the FSSD only had to be deepened regarding its current application. The FSSD is not prescribed to be used in a certain way and is rendered as highly adaptive to any given context, therefore generalizations about the use are difficult to derive and the presented results do not claim to wholly represent all contexts the FSSD is applied in. It was likely that there are several different user cases even in a small sample, what became visible in the data set. The strategic selection of practitioners in phase 1 contributed to the validity of the research.

In phase 2, checking in with organizational representatives and selecting the organizations following a set of predefined criteria ensured a diverse sample, representing a diverse set of cases and contexts the framework is used in. The interviews helped to refine the previously identified insights about SSD using the FSSD in practice. These insights were based on the perception and experience of one or two persons per organization who found themselves in a qualified role to provide this information, according to the defined criteria. The researchers were dependent on the will of organizations to donate their time during the very complex situation of the COVID-19 pandemic. The sample organizations each came from different industries (see appendix E), indicating that there is room for exploring other scales and forms of organizations or to focus on particular industries. The understanding of the FSSD might also differ highly within the different sample organizations, as the employees might have been trained differently and in different contexts. This research did not receive input from non-FSSD trained employees on their views and did not inquire the experience from multiple members in organizations due to the limited time frame of the research. There is room for more qualitative and quantitative research to clarify the impact of organizational SSD using the FSSD on the resilience and AC of organizations. It also has to be mentioned that even if the research questions focus on ‘organizations’ as such, statistical generalizations cannot be made from exploring a fairly restricted sample. According to Yin (2014), the sample nevertheless allowed

the generation of analytical generalizations, as presented in the discussion. The same accounts for the practice of FSSD in organizations. However, the outreach strategy as outlined in the sections above aimed at including as many relevant voices as possible, addressing the validity concern of producing generalizable findings from an analytical perspective.

For phase 3, the interviewees from phase 1 were re-invited to join a group discussion, providing a platform for triangulation and deeper sense-making. Recalling the voices that helped to feed the results for SRQ A and B adds to the general validity of the research, as the participants organically started to fill in some open gaps from the interviews. Nevertheless, a validity gap lies in the method of focus groups itself: it invites cross-pollination and statements that build up on each other rather than unbiased, uninfluenced statements. Considering the aim of this phase, this can be seen as a positive aspect as the participants exchanged on individual experiences of a human-centered practice.

In all phases, participants were guided through a consent process that elaborated on the purpose, the process, and publication of the research and they were assured anonymity. This, nevertheless, does not guarantee unbiased and open responses, since the responses might have been restricted by the future disclosure of the research results.

2.5. Triangulation

In order to leverage the reliability of the study, the research team aimed at combining and applying different research methods and perspectives to gain insights into the questions at hand. Validity concerns were addressed by the different formats and target groups, as well as by the diversity of participants. Having a variety of sources, methods and different groups of participants adding to the data base increased the diversity of perspectives – yet it also increased the difficulty of analyzing the data in a coherent, clear way. A comparative stance was perceived as enriching regarding the contributions from outside and inside the organizations. The clear deductive nature of the analysis regarding AC proved helpful to generate structured results.

In all steps, and particularly during the analysis of data, a joint effort of the three researchers in sampling, writing, coding, reviewing and adapting, supported the rigidity of the final report. By having two or even three perspectives involved in every step, the team discussed and addressed potential biases as the research evolved (see section 2.7).

2.6. General limitations

The 3.5 months-timeframe of the research can be seen as a major limitation, relating to external deadlines of the master program that had to be met. Next to that, this research was conducted in the midst of a global crisis, namely the COVID-19 pandemic. In general, the researchers had to adapt to this changing context, both regarding their own coordination but also regarding the collaboration with organizations, practitioners and supervisors from the university. Both the limited time available and the general state of crisis impacted not only the general scope of the research, but in particular

- the choice of methods, leaving out a quantitative approach in the nature of a survey,
- the number of FSSD practitioners participating in phase 1 and 3,

- the number of sustainability champions participating in phase 2,
- the number of researchers performing the coding,
- the analysis of the results, which could have been of a deeper nature.

The importance of a very clear and pragmatic language stood out clearly. A clarification of how the researchers used the conceptual elements in the context of this study was of highest importance, in particular regarding AC. This might have limited the degree of academic literacy and value of the research.

Involving external practitioners who in general have a limited insight into organizations' internal developments on the long term in phase 1 limited the quality of generated insights. The organizational perspective in phase 2 was only expressed by one or two representatives per organization and therefore cannot be seen as valid for every employee.

2.7. Assumptions and biases

In general, qualitative research is and remains subjective. Interpretation and analysis of the results are likely informed by the backgrounds of the researchers and their scope of scientific experience. The diversity of the three researchers, coming from three different countries (Brazil, Belgium and Germany) and different sectors such as biology, performing arts and fashion retail, led to a vibrant exchange and helped them to identify biases and assumptions along the process. The researchers hereby acknowledge a mainly western perspective on the topic, influenced by the latest professional activities of the researchers. As all researchers were introduced to the FSSD and the concept of AC during the same program, they started with an aligned level of basic knowledge and a shared idea about the needs of further exploration.

It was a shared effort throughout the process to align the researchers' assumptions and expectations regarding the process and the outcomes of this study. A focus on the team journey and some pragmatism on the thematic side thereby helped them to move ahead in a decent manner.

Next to the biases of the researchers themselves, biases and personal opinions of the participants in the different phases needed to be considered. Working with human beings, several uncertainties and ethical concerns were addressed.

2.8. Normative and ethical considerations

The ethical considerations for this research concerned the research design and the processing of the results. They did not only inform the gap the researchers aimed to address, but also the choice of methods.

Understanding the critical role of ethics in social sciences, people involved in the research process were treated with dignity and in the most conscious and respectful manner possible. This included to respect the individuals and their privacy, both in direct contact and considering data management. Working with individuals, acting in alignment with their fundamental rights was of highest importance. The researchers aimed at providing a protective, safe environment that also considered the individual level of ethics. Some participants shared stories from their

experiences in organizations, which clearly requires ethical treatment regarding data processing and publications.

It has to be mentioned that all research was conducted in an online environment. Channels were selected with a high degree of security, privacy and confidentiality, accordingly to the GDPR standards. A clear explanation and onboarding of participants decreased the level of their vulnerability. Another critical element taken into consideration is beneficence, doing no harm to any participant and maximizing the possible benefit for everyone contributing. The researchers aimed to move beyond the elimination of risk and further explored options of providing a beneficiary outcome.

The transparency of the processes involving participants was one of the main ethical considerations and action elements. All relationships with participants, the retrieved data and the topic of self-disclosure were considered in the form of ethical approval and informed consent. A shared statement elaborated on the process, the data management and the handling of results and insights. The researchers clearly communicated about the risks and benefits of contributing to this research and the voluntary nature of participation, as well as the confidentiality of the contribution. The consent form containing these elements was distributed to participants upfront and the signed versions were collected and properly documented. Furthermore, the participants had the opportunity to withdraw their participation until two weeks after the contribution took place, giving them the space to reconsider their contribution.

Next to the consent process, all relationships with participants, the retrieved data and the topic of self-disclosure were considered in the form of measures to guarantee privacy and confidentiality. The measures in this regard were informed by and aligned with the official GDPR procedure and were disclosed in the communication. The researchers worked with personal data and therefore the research project was officially registered at BTH and the data was stored on the official online drive (Microsoft one drive) provided by the university, which is aligned with the required GDPR standards. Records and transcripts of the interviews and focus group were stored on this drive and only accessible to the three members of the research team. The data was processed as described above in the methods section. All data will be deleted after the research has been successfully finished and defended.

This research also holds a strong normative perspective. Striving towards sustainability is value laden and seeing a sustainable society as a desirable goal is a normative stance (Broman and Robèrt 2017). The discussed topics are of global concern and are often informed by worldviews, culture and different values. People can be involved on an emotional level, and this also accounts for the research team. Defining tangible working definitions of the used concepts therefore was of critical importance for this research. Considering the points mentioned in the limitations section, all outcomes should be interpreted with a critical stance.

3. Results

The results part of this thesis follows the three SRQs that were introduced in the prior sections. The data addressing SRQ A and B is presented interweaving the findings of both, phase 1 (outside-in perspective) and phase 2 (inside perspective). The insights are rounded off by the data set concerning SRQ C from phase 3. The seven interviewed FSSD practitioners (also referred to as practitioners) have the abbreviation P [1-7]. Interviewed sustainability champions are abbreviated as S [1-7] and O [1-7] stands for the correlating organization. Two sustainability champions that work at the same organization (O1) are referred to as S1a and S1b.

Practitioners contributed with fundamental and broad insights that were often directly tied to the elements of the FSSD. The contributions of the organizations practicing SSD on a longer term (O1, O2, O5) in general were richer in nature than the ones from the organizations practicing between 0-5 years (O3, O6, O7). Nevertheless, the sustainability champions of these organizations contributed with fresh and curious perspectives regarding the use and understanding of the FSSD. A short introduction of the practitioners, organizations and sustainability champions can be found in the appendices D and E.

3.1. SRQ A: the current application of the FSSD in organizational contexts

The practitioner insights were intertwined with the practice presented by organizations in order to holistically address SRQ A: "*How is the FSSD currently applied in organizational contexts?*" The first section will link the theory to the practice and will zoom in on how the different elements of the FSSD are used in practice. Indicators for a successful practice and the human-centered aspects that come in when applying the FSSD are presented in section 3.1.2 and 3.1.3.

3.1.1. Theory in practice

The practitioners considered the FSSD as an overarching framework that unifies language, creates shared mental models and enables the engagement of multiple stakeholders. P7 argued that one should utilize the framework in a holistic way, benefiting from the storyline and mindset it provides. Also P4 warned of the mistake to break the FSSD down into its constituent parts: "It's the overall rhetoric or philosophy of a new paradigm in thinking and a way of thinking about sustainability." Whereas the framework was considered simple, robust and credible by P2, P4, P6 and P7, some practitioners outlined that users of the framework can slip into technical jargon (P1, P3). Furthermore, the FSSD's nature as a strategic decision-making tool has been highlighted by O3 and O5: "The FSSD helps to be more strategic and it makes people think about something before they go down that path." (S5)

Whole systems thinking

At the core of the application of the FSSD is a whole systems perspective and all interviewees stressed the importance of taking this holistic stance. The FSSD was perceived as a framework that is designed for enabling transformation and whole system change, which gets visible in

shifting mindsets around this perspective (P1, P3, P7). P5, S2 and S5 talk about mindset shifts of the whole organization and for S7 using the FSSD was "the beginning of thinking in a broader perspective." P3, P4 and P5 used the metaphor of a birds-eye perspective on the environmental and social system and P5 and P7 even rendered a certain systemic understanding as a precondition for working with the framework in the organizational realm. In alignment with that statement, all sustainability champions showed this systemic understanding.

A critical tool for using a systems perspective is the 5LM. Looking into the interviews, it is apparent that no sustainability champion mentioned this model. Practitioners named it as a structural support and described how it helps to create an overview of the bigger picture. Nevertheless, they didn't use it in their work with organizations (P3, P4, P5). P5 perceived it as the backbone of his work, but he never voiced it towards clients.

Backcasting and the ABCD procedure

Backcasting was familiar and used by all interviewees. Furthermore, all practitioners applied the ABCD as proposed by the FSSD, though in many different shapes and adaptations. P4 elaborated that the process fosters mindset change by using a storytelling approach: "The tool is to enable action to eventually arrive at the definition of success. [Backcasting is the] mental model of the sustainability journey." P6 also described backcasting as a mindset, one that encourages transformational conversations as "[…] it reframes things, […] from 'how do we improve today? [to] what are the steps we need to take to get to what we truly want?" P3 highlighted backcasting as the heart of the FSSD: "[…] we are strategic and systemic because we do backcasting from success." The ABCD procedure was described by P6 as a communication tool for the notion of backcasting, to make it tangible. This was also visible in O3: "The ABCD analysis will help us a lot to make it clear to everyone that we have to think this long-term way." (S3) P7 referred to the ABCD procedure with a metaphor of a roadmap which supports the co-creation of strategic transitions towards sustainability, by serving to design programs, tools and indicators as well as community building.

All steps of the ABCD procedure were mentioned by the interviewees. P5 described the elements of the vision (step A) as space that nourishes the creation of shared language. It was experienced to build awareness and a common vision of success. In the same context, P7 and P5 brought up the importance of timeless purpose, navigation and orientation. According to P6, the unseen is explored in step B: "That could be a conversation around what are some of the key-ways that we're contributing to a violation of those principles [SPs]." P2 highlighted the empowerment this step adds to the process, fostering a creative tension. Step C was seen to be rich in outcome with a diversity of stakeholders (P1). S5 stressed the value of the prioritization step (step D) from a business perspective. S6 argued that, in this step, adaptation is critical: the big size of the organization requires prioritization on different levels. What is remarkable: when asked about the ABCD procedure, the practitioners talked only about the process itself and not about the outcome. The action plan as last step wasn't mentioned by any practitioner.

The experience of O1 showed the iterative nature of the ABCD procedure. They did backcasting exercises in smaller groups and sometimes with the whole organization. After several procedures with an advisor, they had people inside the organization that were trained and could facilitate the processes themselves. O1 used backcasting whenever they had a problem or if they got stuck on something, going back and forth between the different steps if needed. In O3 several smaller and one whole-organization ABCD procedure were facilitated internally despite

using the FSSD for less than one year. “I think that ABCD is very easy to do. […] I think that the difficult thing is to connect it to the sustainability principles, to the rules.” (S3)

The sustainability principles

The Sustainability Principles (SPs) were well known by the all the interviewees and they outlined the sustainability challenge as meeting humanity’s needs within the given system constraints. In O7, O5, O3 and O1, the SPs provided guidance to make decisions with a strong scientific backdrop, what was also referred to as “rules of the game” (S1a, S3, S7). All sustainability champions stressed the importance of having a shared definition of sustainability with a scientific foundation. However, some practitioners outlined that the terminology is not the most important thing, but it is the understanding that comes with it (P3, P4). P3, for instance, didn’t consider the SPs as a core element of his work as for him the importance lied in success defined by sustainability conditions in general. For him, these conditions might also be lent from other concepts. At the core of this understanding was the shared idea that the SPs are sometimes hardly digestible for different audiences. P1, P3, P4 and P5, for instance, addressed the SSPs by using the basic human needs (see Max-Neef 1991) and P3 used the Sustainable Development Goals (SDGs) in several cases to simplify the collaboration. The explanation given by P3 was that nowadays the companies design their sustainability journey based on the SDGs and therefore, it is strategic to use this common understanding as a fertile ground.

Some practitioners still used four SPs instead of eight SPs (P1, P3, P5, P6), covering the social aspects under one principle. There was awareness of the five SSPs[1]. This is also reflected in the data of the organizations: S5, S1a and S1b talked about four SPs. For O1, O2, and O5, the focus has been on working with the environmental SPs and in case of O5, the industrial context was very receptive for the scientific language of the first three SPs. Only in O6 and by P2, the SSPs were used actively to facilitate conversations and design initiatives.

3.1.2. Factors and considerations for a successful application

Contextualization, adaptation and complementation

A key element in the sustainability practice with the FSSD is contextualization. All practitioners touched on the need of customization to the context and size of organizations. Several practitioners also highlighted that the FSSD is meant to be adapted to different contexts (P1, P2, P4, P6, P7). P1, P2 and P3 specifically talked about the need to tap into the existing culture and worldview of the organization. More than one practitioner voiced that they tailor language and processes to meet the organization where they are, creating relevancy (P1, P2, P4, P5, P6).

For O3, the open nature of the FSSD stood out as an added value in comparison to other consultancy approaches. O6 adapted the framework to their governance model. Yet early in the journey, O3 also already started adopting the language of the FSSD to their context. O2 combined the FSSD with the principles of biomimicry to make framework more tangible in their specific context. The practitioners echoed this need for complementary concepts: “It [the FSSD] is a necessary toolkit, it is a necessary tool to be able to drive transformational change,

[1] The FSSD was first developed with four SPs, three ecological principles and one social principle. The five social principles were developed in 2015 (see Missimer 2013; Missimer, Robèrt, and Broman 2017a; 2017a).

but it needs to be complemented by a number of other ideas and concepts to actually make it work" (P6). P1 and P2 specified that need regarding the human-centered side of the practice. Tools used in the interviewed organizations are for example the planetary boundaries[2] (O1, O2), Theory U[3] (O7), Art of Hosting[4] (O6, O7) and biomimicry[5] (O2).

Collaboration and participatory processes

Another critical factor when practicing SSD: collaboration. According to P5, the FSSD theory only added value if it helped individuals and groups to start organizing themselves in a collaborative way. For backcasting processes in O1, people from different parts of the organization come together because experience showed that this leads the best outcomes. O2 experienced collaboration both, inside and with partners on several sustainability projects. O1 and O3 are members of a network of organizations that practice SSD and support each other.

Practitioners described the power of participatory processes to foster collaboration and create ownership. The approach is action-oriented and motivating for the people involved (P1, P4, P5). Co-creation was perceived as beneficial by most practitioners. P5 stated that "it's about the people, if you don't acknowledge that then it doesn't matter what frameworks and tools and whatever you start using, you're not going to get anywhere." P6 followed this thinking: "Ultimately you're dealing with people in organizations and […] the relationships are dynamic and complex. There's no sort of one on one approach." P5 linked this to the strong scientific reasoning for participatory processes in complexity theory and social systems change. The unseen is an important element in sustainability journeys and participatory processes create helpful spaces for conversation, bringing it to the surface (P2, P5, P6). Here, trust building was described as a key factor (P2, P5). Nevertheless, the scope of facilitated sustainability projects sometimes leads to missing out participatory potential (P4).

Iterative nature and learning culture

The iterative, spiral nature of a sustainability practice using the FSSD was stressed repeatedly. P1, P3, P6 and P7 highlighted the iterative use of procedures on multiple levels and with different audiences of an organization. O1, O2, O3, O5, and O6 used procedures in iterative ways over different timeframes. "The process continues, you never get to the point of saying right we're fully sustainable, it's always a challenge, it's a perpetual cycle." (P5)

In several contexts, it has been observed that practicing SSD using the FSSD is related to a learning culture. For O2, the learning culture was shaped by the FSSD as a frame that formed their mindset over time, influencing the organization's thinking and learning. A similar observation has been made in O1, another long-term user. P1 and P7 rendered the potential for experiential learning through a repeated, collaborative application. P4 said that over time, organizations start to build up autonomy in applying the framework. To enable this, P4 saw the need of training and ongoing external support. However, P1 argued that often, the framework

[2] The planetary boundaries is a concept that "defines a safe operating space for humanity based on the intrinsic biophysical processes that regulate the stability of the Earth System" (W. Steffen et al. 2015, 1259855/1).
[3] Theory U is a change management method, following process stages in an U shape (see Scharmer 2009).
[4] Art of Hosting is a participatory methodology focused on personal practice, dialogue, and facilitation to create innovation towards resolving complex challenges. For more information see www.artofhosting.org.
[5] Biomimicry addresses complex problems by the imitation of natural systems and elements (see Benyus 2008).

is presented too early and in too much detail, taking out motivation for further steps. P4 voiced that the FSSD can be perceived as complex and too abstract and "sometimes it takes too long to people to understand it." Furthermore, P7 elaborated on the difficulty of teaching alongside the facilitation itself, as time is needed to develop understanding and learning. This was also reflected in the organizations: S5 and S7 perceived working with the FSSD as hard work. "You have to put sweat and effort in it, you need to be committed." (S5)

3.1.3. The human-centered core of a sustainability practice

Facilitation and process design

Facilitation was mentioned as a critical aspect for applying the FSSD: adapting and preparing the processes appeared crucial. Practitioners stated that they sometimes use the FSSD only behind the scenes (P2, P4, P5), "simply because it's about meeting people where they're at." (P5). Furthermore, P4 observed that there is no unified way to get the message over to customers and little best practice. P4 and P7 highlighted the different user cases of the framework: from strategy to education to product sustainability. P4, P5, and P6 touched on this manner by highlighting the importance of tailoring their language. P4 specified that it is necessary to have a facilitation approach at the level of the organization's culture. P1 and P4 agreed that facilitation needs to be tailored to the context of the organization, meeting the people where they are. In this context, the importance of preparation and understanding the specific context upfront was stated by P1, P2, P3, P4 and P5.

Adding to this, P3 outlined that "the way the process is designed is the way the organization connects and forms insight of their journey and how change happens." In this context, the element of storytelling was mentioned by P2, P4 and P7. P2 reflected on the nature of facilitation: "[Too disruptive elements can] trigger bounce-back reactions led by fear and denial. In some cases, disruptive works." According to P2, P5 and P7, the best approach to facilitation is to be part of the process and to provide guidance instead of giving answers.

Holding the connection between the bigger system and the specific case was mentioned as a challenge (P2). P5 stressed that a fostering a systemic understanding is a needed effort to make the rest useful and truly strategic. P1 and P4 brought up the restrictions of facilitators as human beings: facilitation might be impacted by biases and depends on the facilitator's capabilities. Facilitation and even the participants can get stuck in methodology, what was described as a lack of trust in a prototyping and experiential learning approach (P3).

Leadership and organizational culture

Another crucial element regarding the application of the FSSD is leadership. P1 and P2 shared that the FSSD proofed to trigger changes in the worldview of leaders. This shift and an according way of leading organizations through SSD can be a tipping point for transitions towards sustainability. P2, P4 P5, P6 and P7 agreed that a deep commitment of the leadership is needed to foster long-term changes. This in particular was related to trust building. P2 exemplified how communication fosters trust by creating direct channels to communicate with leaders. This was also represented in the participating organizations: there was a strong leadership commitment in O1, setting strategic goals and heading a sustainability network. The case of O2 became popular for the thrive of their leadership.

The empowerment of employees was perceived as another critical enabler. S2 shared the experience that "with the empowerment of people everybody realizes that he or she can be a leader on its own, because you are an expert in your field. A CEO doesn't know everything, he is relying on everyone." Empowerment of employees brought autonomy, dynamism and diversity in responses to the challenges O2 has been facing. O3 endorsed leadership's role in engaging people. Fostering cultural openness and working together will give the employees the feeling that they are heard and that they can take action.

Several practitioners referred to the element of a cultural fit as a lever to change (P5, P1, P2). P1 affirmed that a certain openness and collaborative culture is needed to tap into the potential of using the FSSD, in order to create a common language and engagement of the whole organization. He made the link between the flexibility of management or leadership and the ability of an organization to create their journey, allowing to be more creative about sustainability. S3 reinforced how essential it is to have an open mindset combined with a systems perspective. In O3, working with the FSSD gave another opportunity to embody the existing culture and invite people to act on it. In this case, the FSSD added structure and a scientific background to their sustainability journey.

P1 perceived a general lack of integration of leadership and governance into the sustainability discussion, also linking it to the culture of an organization. He brought the idea that culture change towards sustainability requires a certain type of leadership, but the FSSD can also help to foster it when applied in spiral and participatory processes. A related reflection was that practitioners lack the opportunity to observe culture shifts and transformation in the organizations as they are external consultants (P5, P7).

3.2. SRQ B: fostering AC of organizations through SSD

The next sections present the data considering SRQ B: *Does practicing SSD using the FSSD help to foster the adaptive capacity of organizations? If so, how?* After presenting some statements about resilience in general, this section explores the link to AC by outlining the results regarding the five different key elements of AC. Sections on designing for resilience and conditions to foster AC in organizations round the results for SRQ B.

When talking about resilience, many practitioners and sustainability champions outlined it as an organization's ability to adapt to possible future scenarios, both internally and in relationship to their environments (P1, P3, P5, S1a, S2, S5). In this context, a sustainability practice was granted the role of moving the organization from reaction to proactivity. In the case of O5, starting to work with sustainability in the face of a crisis situation turned the trajectory of the organization: through years of sustainability experience and practice "we've gone from a reactionary mode of addressing all the negative things to one of almost neutrality, to a move [to] the proactive side." (S5) S2 describes this as "transformative resilience":

> It's not only being resilient and surviving during hard times. [...] It actually creates a kind of transformative resilience. Without knowing it, you're actually already acting towards the future. […] Through our sustainability journey, we are always ahead, even ahead of legislation, ahead of customer demands, now wellbeing […] and we wouldn't have realized [this] if we wouldn't have worked for example with the FSSD. (S2)

Several conversations organically arrived at the topic of helpful capacities to foster organizations' resilience and how the FSSD and its application can support building these. Highlighted examples were the alignment around vision and purpose and a common, structured definition of sustainability (P2, P3, P4, P5, P6) but also by the ability to sense and respond enabled by the systems perspective (P3, P5, P6); all facilitated by interdisciplinary, participatory processes (P1, P4, P5). "Applying backcasting can be seen as a sign of resilience in that sense that if they get stuck, they focus on the way forward." (S1a) Fostering the capacity to be resilient nevertheless was rendered as "not a direct objective of the process" (P6, P3). Yet, for some practitioners (P2, P7) it was at the core of their practice. The frame of AC gives the opportunity to make sense of these capacities and explore the relationships more deeply.

3.2.1. Trust

Trust in the context of this research is understood as the attitude enabling people to rely on each other and formulate a positive expectation towards one another. When addressing the question if practicing SSD using the FSSD helps to foster trust in an organization, three practitioners directly answered with a strong, intuitive "yes" (P1, P3, P7), whereas S1a, S1b and S5 stated that it can, but not necessarily.

One element that was often linked to trust was the process of **backcasting** (P6, S1, S2). Under the condition of a creative, clear process design, P6 assigned the procedure the capacity to increase transparency and generate ownership through agency and influence, two elements that feed into trust building. S2, S5 and S7 stated similar arguments on transparency. In their cases, the trustworthiness also expanded to different stakeholders: "We have other relationships thanks to our strategic sustainable approach, because you are more trustworthy." (S2)

Developing a **common language** and shared goals based on a **whole systems perspective** with robust scientific underpinnings appeared as powerful contributions to trust: a sense of alignment was perceived as a lever to increase trust in relationships and enabled collaborating towards a shared, unique goal that is in line with "what science says" (P3, P4, P7, S1a, S2, S6, S7). S2 stated that "there is a more common base to work on and therefore it's easier to trust each other. […] It starts with this mission, and that also of course builds trust because it's clear for everyone in the organization, where the company's heading." In the case of O6, the fast growth of the organization led to a decrease in trust and the shared sustainability vision helped to bring the disconnected departments together. P7 highlighted the capacity to build trust through the organizational goals because they relate to a higher meaning, connecting roles of employees to a contribution to society and the world. S1a verbalizes this connection to common meaning, stating that "it helps to create common meaning and that may also help [to] feed back into the whole trust issue" (S1a). This connection was also made by a practitioner:

> I would think it enables trust, because of the fact that it's more meaningful: you have the vision, the fact that you are focused on the future where you have succeeded and through that you have the rules to maneuver. (P7)

The role of the **SPs** as a means of enabling transparency came out clearly (P2, P7): "The further you break down the FSSD into the principles, into questions and into finding the answers and the conclusions, then you create trust. [Especially] when you point out issues through the social principles and you take care of those issues" (P2). S1a and S6 showed similar understandings and approaches, highlighting the power of the SSPs with regards to fostering trust.

A related aspect regarding trust is the trustworthiness of the framework and the approach itself, which is related to the **scientific basis** and the continuous improvement over a longer timeframe (P5, P7). In O1, the FSSD enabled the employees to have confidence in the leadership team, because they would act responsible and create a good working environment. S3 reflected that, both on the short- and long-term, communicating that their sustainability practice is science-based helped to build trust inside and outside the organization:

> I wanted them to know that there is a way to define sustainability and that we are responsible for the company. We have a way to work with it. And then of course we will break it down and everyone should work with it. Hopefully they feel more trust that we work with sustainability in a scientifically correct way [and that we] care for what is happening here and for the next generations. (S3)

P3 elaborated that "applying the FSSD in a spiral, an Art of Hosting way builds trust, because you share a common image, a common language: are we putting the same things behind the word sustainability?" The Art of Hosting practice is based on human-centered and participatory approaches, which were also described as helpful by other practitioners (P4, P5). These practitioners also aligned on the powerful impact of a shared understanding that derived out of **collaboration** and **participation**.

> Using the FSSD builds trust when you can create a process that brings people from different domains in the company to the same space in a new topic that they're not all experts in. Giving them a common language allows them to relate to the new domain. […] this helps them to feel confident in their collective ability to collaborate. (P4)

S1a also outlined how collaboration and participation in backcasting help to foster trust:

> Backcasting processes can create trust because a group figures out how to deal with a problem together and everybody is on the same page. […] When the workshops and the process function well they help to build trust, because they help exchange ideas and understand where different people are coming from. [It] signals that you value everybody's input, and that everybody's equal in the room. And that links to trust. (S1a)

For P6, not only the fact that everybody's input is valued contributes to building trust, but also the fact that ideas of employees are reflected in the direction the organization takes. "People are constantly asked and get the feeling they're heard, and the things they came up with show up in strategies or actions. Of course, that's very trust building." (P6) If well applied, SSD using the FSSD doesn't only foster trust in the organization, but also on a **personal level**. P7 argued:

> [It] is fostering trust in the people themselves: employees are empowered through offering solutions […] and then if some of the solutions that appeared in the process are implemented, that shows the element of trust in the employees, that shows that the employees are contributing, writing the future of the company. (P7)

As already mentioned, the use of **complementary methods** and tools like Theory U or Art of Hosting seemed of critical importance in order to create the spaces where trust can flourish (P2, P3, P4). Nevertheless, it has been acknowledged that participatory processes need a certain level of prevailing trust to work and succeed (P5). What is not to deny: fostering trust takes time and is a long process, as stated by P2, P5, and S6: "over time it might trickle down and sort of affect the rest of the organization" (P5).

3.2.2. Learning

Learning allows humans and systems to continuously sense, develop and prototype responses to changing environments, both individually and together. There was a general agreement that a sustainability practice as introduced by the FSSD enables organizations to better **sense and respond** to shifting contexts, guided by a shared vision that considers the Earth system boundaries and by a tailor-made strategic direction (P1-7, S1a, S1b, S2, S3, S5). According to practitioners and sustainability champions, several elements of SSD contributed to this form of learning. In application, "the funnel, backcasting, the system conditions, the whole jazz" (P7) were perceived as powerful instruments. S1a summarized as follows:

> Practicing strategic sustainable development does foster learning, in the sense that it creates a challenge so you have to figure out how you need to adapt that organization in order to meet the goals that we have that are defined by the FSSD, and so in that sense, you're going to have a learning process. (S1a)

For P5 it stood out that "whenever something is thrown at you, you need less processing time to know how to properly respond, you develop a gut feeling for that action. You're going to choose for something that has bigger chances of moving towards the opening of the funnel rather than running into the walls, it informs preferences and increases your awareness." Several practitioners described the increase of the capacity to learn in the **reduction of risks** (P5, P6, P7), which was proven as organizations moved forward on their sustainability journeys. With a better understanding of key challenges and trends, both threats and opportunities become clearer and can be considered in decision-making processes (P5). Tangible manifestations of sustainability-related learning are innovations in products, markets, process and even in business models (P2, P3 P5, S2).

When applied in an iterative, participatory manner, **backcasting** is one of the elements that help to sense and respond. It fosters learning as "you need to be aware and sense and respond. Doing it brings learning and learning makes you do it better, and it's a positive cycle. […] You can respond more agile after sensing the situation. […] It opens up agility in planning, making users more open for changes along the way as it shows multiple routes towards a vision." (P3) Furthermore, through backcasting people are invited to explore and try out themselves as "the process itself with the scientific support of the FSSD helps people to learn" (P4). P1 stressed this capacity and named it core to resilience itself:

> Having everybody tap into the organization, being creative, giving them space to design, find solutions, get together to solve problems, to actually create what the organization looks like in the future is a key component of the resilience, […] allowing for everyone to be the eyes and ears of the organization through a process for what society needs from us now [...] and have that as an ongoing sort of alignment within the organization. (P1)

S1a and S1b shared a similar perspective: "Applying backcasting can be seen as a sign of resilience […] in that sense that if we get stuck, we focus on the way forward […] it encourages us to learn together in our roles in the organization." (S1a) S6 argued that "just by applying it, the people involved have had to learn this way of looking at things."

Applying backcasting was also described as a **strategic** way to reduce risk. If it is leading in the right direction and if it is a flexible platform, "you can go for it. […] And maybe sometimes you can jump a little bit further because of the situation and elements being there." (S2) The FSSD helps to be more strategic in making decisions and it helps to avoid "blind alleys." (S5) P7 described that people in organizations felt a sensation of relief when they had a shared language and solution-focused approach when it comes to sustainability. This relief was furthermore fostered by the awareness that there are multiple ways towards a common future.

Another element that was linked to learning is the **systems perspective** of the FSSD. By fostering a whole systems view that frames the envisioned future, the FSSD contributes a strong reason and stable orientation for learning (P1, P2, P6, P7, S1a, S1b, S2, S5). Individual, organization and society can be put into relation once discussions about the own role in the bigger picture take place. S1a describes that "not only learning about sustainability is fostered, but also learning about strategic thinking and holistic thinking". P7 stated that organizations "have learned a way to look at the world and from there they can see options which are good for them and good for the system." P2 shared the same opinion: "Holistic thinking and a systems perspective […] enable you to step ahead and be not in the need to constantly react but respond or already achieve things before." P4 went further, saying that if there is no holistic sustainability thinking considering the system boundaries, designs will have unpredictable rebound effects that might be rather harmful to the wider organization as a system. In this context, he also stressed the relevance of the FSSD as a frame for learning. The related **visioning** element of the FSSD was also directly linked to learning:

> A question I get a lot, especially with regards to resilience, is how did you map that out, how did you know what to do? We didn't. But only based on this vision, every time we had to take a decision, we took the decision which brought us closest to this vision. The moment you map the route to the top of mount sustainability, then actually this route map is already out of date. (S2)

P4 mentioned that the **scientific backdrop** and systems thinking help learning about complexity and how to acknowledge it in own actions. P1 and P6 shared this opinion. "Understanding the science or at least the concept of the principles can help people see that we don't have all the answers today and need to look for potential unknowns." (P4) Nevertheless, S1a stated that the FSSD gives you clear information about what you need to stop doing in order to transform and overcome challenges: "Understanding what the principles mean and trying to understand how we can develop the organization so that we don't violate them, both of those require learning." S3 echoed this in other words: "The FSSD gives me the science behind this intuition that it should feel good."

Fostering learning in organizations was also clearly linked to the **participatory processes** practitioners often use: "It's an exploration of what's happening in your organization but just with a different lens […] and then also do it together in a process where you're harvesting those thoughts and ideas from a broad range of people." (P6) When practiced in participatory ways, SSD "means people are actively taking on new skills" (P7). A question-based approach was often applied by practitioners and this approach opens spaces for learning (P2, P5, P6, S2). In relation to the question-based method, it has been stated that "it's only when these questions are asked along the way that this learning will take place. It's like a muscle that you start training. Now this happened, what does it mean?" (P5). Participatory process showed to support bigger groups to learn. One observed outcome was that "people start to preach for sustainability" (P7). They step into ambassadorship and they help to chase the paths of the journey on the long term.

In this context, learning from examples has been brought up, both in relation to the sustainability champions, and to the practitioners' attitude and behavior (P2).

P3 highlighted the importance of an **iterative approach** to sustainability journeys when it comes to learning. Experiential learning was observed to evolve only over time: "learning together only happens when people are exposed to it time and time again, this doesn't happen when you just do a project and then you go on or when you get the training." (P5) The capacity building for learning took form in different shapes, for example through teaching or training (P3, P7), backcasting exercises (O1), or ambassador programs (O2, O6). Although S6 shared the opinion that the people involved by applying the FSSD "have to learn this way of looking at things", he clearly stated that "learning is still something that needs to be developed by a company." In relation to this, he rendered how using the social SPs seem to be not enough and that there should be active learning capacity building beyond the SSD practice, as seen in O2.

The case of O2 shows a learning journey, framed by the FSSD. S2 described how the framework and practice inspired an opening up and sharing mindset over the long-term. Increasing transparency, exploring new markets and entering new partnerships were only some examples. Through their sustainability journey, changes in roles and relationships were encouraged; and people were more daring "to step up and to step out, to go beyond what is safe" (S2).

3.2.3. Diversity

This thesis understands diversity as a variety of ideas and responses to a changing environment. Different elements of the FSSD were linked to fostering this capacity. One example is the **systemic perspective** which invites actors to see what or who might be missing for success, tapping into new potentials through the SSD processes (P4). The element of the ABCD procedure that was highlighted in particular was the **creative ideation** in the C-Step (P1, P2, P7): "When you talk about diversity, for me it seems like it comes at the c-step. That's where diversity of thought, diversity of solutions [come in]." (P1) By helping to point out complex problems, the FSSD invites to "think outside the box and […] add more and more strange ideas because you really don't have the answer. So you really have to stretch yourself." (S1a)

SSD was described as a practice that creates spaces to co-create solutions (P2, P3, P4, P5). Through the **participatory** nature, which is recommended by the FSSD, diversity can flourish. "We did a workshop to create the vision. And when you actually let them speak, they hear each other, they can build on each other's ideas." (P2) P3 shared that "they are still passionate about whatever, but they now can actually communicate with people in the other silos." This was also underlined by P5: "This is what it's designed for. You get people from a lot of different departments with different ways of looking at the world in a room [...] and then just let them talk." According to S2 this is linked to the different ways you can reach the goal: "You also have diversity, because there is no one way solution to the goal, everyone from his own position and own role can play a part, and that diversity is very crucial as well." S1a echoed this:

> It fosters a diverse approach, or at least thinking about different ways how you might get there, because the most important thing isn't exactly how you get there, the most important thing is that you get there […] it encourages diverse thinking, because if there are seven ways to get to the goal, but four of them have real advantages, then you know you can choose from those. (S1a)

The aspect of human diversity in going through a SSD process was stated as key to generate diversity of thought (P3, P5, P6, S1a, S2): “We oftentimes encourage organizations to do that based on a diversity of people from across the organization, […] to think about the organization [from multiple perspectives] and making sure that people see themselves in the bigger picture.” (P6) This was repeated by P1 who shared that, while going through the C Step, organizations realized they need to look for voices outside the organization: “Just the realization that sometimes the solutions you require need a totally new set of people that you need to bring in because they don't already exist in your current organizational setting. It is a diversity question.” This was also seen in O2 that often invites external stakeholders into the process to open up discussions. “It helps looking for the unusual suspects, in approaches and also in roles” (S2).

In general, the role of **facilitation** and the chosen **processes** and methods seemed relevant: next to a variety of data collection methods to catch ideas, creating a trustworthy safe space and coming in with patience and tolerance were critical for P2. S2 mentioned a question-based approach. Furthermore, a long-term application of SSD showed to further open the discussions between involved parties (P2). In O3, diversity was already a part of the culture, but a framework like the FSSD gave them a structure to amplify it and foster more creative solutions.

3.2.4. Self-Organization

In this context, self-organization was researched as the coordination that develops from the local interactions between members of an organization. For both, practitioners and sustainability champions, the relation to this element was difficult to describe. When asking if SSD fosters self-organization in organizations, P1 answered: “The answer is no, I think it could, but the answer for now is no.” Some practitioners stated that it is not a focus of the sustainability journey (P1, P2, P5). Yet the “FSSD theory only adds value if it helps individuals and groups to collaboratively start organizing themselves in service of transition towards sustainability.” (P5) P2 stated “It’s a weak spot!” S6 also outlined that the self-organization only happens in the sustainability working groups and not in the whole organization. However, in O1, where SSD was practiced for nine years and O2 that uses the FSSD for over 20 years, the sustainability work directly encouraged interaction between colleagues.

One way in which practicing SSD helps to foster self-organization is through the creation of compelling, **strategic goals** that require cross-departmental **collaboration**. “It's an opportunity for self-organization and we do see that because you observe that they set up working groups or committees. People can come together, beyond the traditional hierarchy of an organization.” (P6) It was experienced that by encouraging teamwork and collaboration, involved parties explored new ways of working together. New spaces and ways of interacting could emerge: “It can help set up goals and shared alignment in the company overall which breaks down or cuts across different divisions” (P4). In other words, employees were encouraged to be more active: “The FSSD enables decisions on a strategic level. It empowers the people so that they get active themselves. And that brings resistance, resilience and adaptive capacity.” (P1) P5 agreed that adjustment to sudden changes in the environment can happen more self-directed and from the bottom up thanks to the strategic guidance. In the case of O1, S1a observed that “working with the FSSD has enabled us to, through backcasting, develop clear goals that are communicated to the organization, so we know what needs to be done. We can self-organize.” This is also reflected in O2: a clear, framed sustainability vision enabled the employees to self-organize:

> Everybody can come up with ideas that are feasible for them in their role. You don't have to tell people what to do. […] A lot of people […] have more possibilities to actually [self-organize], because they already know what is needed, where the company is heading. […] So, it's far more guided, actually, and also directs your actions, without stating what those actions should be. (S2)

The **participatory** way of implementing SSD was also experienced to invite self-organization by multiple interviewees (P1, P3, P5, P6, S6). S6 described this connection as follows: "I think it all depends on how you organize the process that's using the FSSD, it all depends on the people that you involve in the process and how you design the process." Participatory processes can create ownership, but only if there is an encouraging **leadership** culture (P1, S2). S2 talked about the strong efforts of O2 to empower employees to dare to step in, with effect: "People feel that they are free to take responsibility. It's not literally or explicitly giving it, but it's really people experience or have the courage to take it." (S2) S1a mentioned a similar observation:

> I think that self-organization is only possible in an organization where people have a mandate. I think that it's not enough that you work with the FSSD. […] You have to have a company culture that encourages self-organization, because if people are nervous about what they have the authority to do, or they're afraid that if they do something wrong, then self-organization won't happen. (S1a)

P3 went deeper into the topic of **governance**, stating the following:

> If you want to transform an organization towards sustainability […] very soon you are confronted with governance. And so you need to have this governance perspective, which includes self-organization. There is a merging between the sustainability movement and the governance-movement, which I think The Natural Step[6] and FSSD have already done 20 years ago. (P3)

P3 furthermore highlighted that SSD would only foster self-organization if being practiced iteratively. He stressed the need of guidance in organizational change. No organization reflected this perspective. P2 took a critical stance, pointing out society's structural obstacles to self-organization, which in many cases overweigh the potential for capacity building: "Many organizations are still very hierarchical, and also very short in time." (P2)

3.2.5. Common meaning

Common meaning was introduced as humans' desire to work towards a purpose and express themselves individually and as a group. SSD using the FSSD was perceived to foster this capacity, both by practitioners and sustainability champions (P1-7, S1a, S1b, S2, S6, S5, S7).

Visioning was the element of the FSSD that was clearly linked to common meaning. Whether creating a **shared vision** or exploring **organizational purpose** and values: using the SPs to frame a conversation around success showed to provide a shared intention to work towards (P1, P2, P3, P5, P7). P5, S2, S5 and S7 highlighted the nature of the vision as a direction-giving compass and P7 talked about unraveling the organizational identity through SSD. This is in

[6] The Natural Step is an international organization using the FSSD to promote sustainability in organizations. For more information see www.thenaturalstep.org.

alignment with S7's experience of rebuilding an organization starting from the vision. O3 was growing and getting more complex; as they were facing the challenge of keeping everything together, they identified the power of the FSSD as a "unifying frame and destination to help us so that everyone goes [in] the same direction." (S3) This organization developed a set of goals which are framed by the SPs on different levels, in alignment with the overarching vision.

For O1, a **clear definition of sustainability** created common meaning (S1a). Using the framework over a longer term, S1a elaborated that the SPs as a definition of sustainability and backcasting had become parts of their culture: "When we run into a problem in the organization or somebody needs help in figuring out what we should do. People say let's do a backcasting, [and then] sustainability is: we don't violate these principles." The impacts of the FSSD and sustainability on the whole organization also materialized in governance, such as policy changes. This was echoed by P5: in a participatory ABCD process "you're with people in a room for several days, you start working on creating a shared understanding, [a] shared approach for sustainability" (P5). P4 considers the procedure to foster "a […] team in alignment, by helping to make a complex topic more structured". Thereby he gave credit to elements like the SPs and the 5LM. "People are building a shared sense of alignment, shared goals and working towards what science says is a shared goal." (P4)

In other words: the FSSD helped to create a **common language** (P1, S2, S6). "It's the possibility to actually have a shared language even if the mandate is different [different departments], they can come together and create amazing change programs with a key set of common goals that apply to everyone." (P1) This was also seen in O6. Reconciling around the meaning of sustainability gave O6 the opportunity to reconnect and S6 used the following metaphor:

> The FSSD is like a bus and people are getting on the same bus now. Where before maybe they headed in different buses towards different parts of sustainability land, and now they're in the same bus and enjoying the party. [It's] a vehicle for being together and being able to communicate on sustainability in a way that is clear. […] The FSSD is learning us to gather around a common goal there, to have a common framework that people can use. And then there's still room for each individual's differences, but we do have one common language, common goal that we focus on. (S6)

At the core of this generation of common meaning is the relation to a **higher purpose** in the bigger system (P1, P2, P3, P4, P6, P7, S1a, S1b, S2, S7). S1a mentioned the connection of the vision to this higher purpose, which enabled them to move from "a sense of urgency [to] a sense of excitement" (S1a). P2 linked this back to the purpose of the organization and to the question of which human need the organization tries to satisfy:

> What will make an organization more resilient is that they ask: What need are we trying to satisfy? Are we really that important for a sustainable society? What is the value that we bring? If we have real value, we will be resilient. (P2)

The origin of the higher purpose was related to **systems thinking**, and SSD using the FSSD was described to help to tap into that shared mindset. When talking about the creativity-sparking way of thinking, S1a shared that "[the FSSD] actually gives you a way to think about how to change when you're faced with something." P4 stated it clearly: "The FSSD makes it crystal clear that you're part of a system." P2 outlined that sustainability as such can become a higher purpose: "How do we become a business that is sustainable and that is fair to people and planet? […] These values can become a shared meaning." (P2) This was experienced in O1 and O2.

Suddenly there was a bigger meaning than just "getting the certification" (P7), what again relates to the vision:

> People can relate more to the purpose of the organization once it's returning as a vision within the system conditions. […] There is meaning in what you do, [how it] contributes to the bigger vision of the organization and thereby contributing to the big meanings of life. (P7)

P1 stated that "the FSSD shows people that the job you do is bigger than yourself" and P6 added that "people feel engaged and feel like their work is more aligned to their values." S2 elaborated on the intrinsic motivation of tapping into each **individual's access point** to the vision and to a holistic set of higher goals. S2 phrased this as follows: "That's the cool thing I would say about sustainability, there are so many routes to Rome. You know that everybody can find his or her way to make that happen." However, S1a stressed the importance of honest processes and the right culture and application of the tools to create space for this ownership.

In O1, the shared meaning was perceived as being spread throughout the organization and people had started to take on tasks they really enjoy. S6 highlighted that it is a slow, stepwise process that takes time and now, after two years of being more strategic about sustainability, the people who were not directly involved also started becoming more curious. P5 outlined this as "the shared desire to contribute to a more sustainable society." The element that translates this into the physical realm was the action plan: "How do we make it happen, how do we actually create the change and not just talk about it?" (P2)

3.2.6. Practicing and designing for organizational resilience

The FSSD sometimes was presented as a tool that provided a scientific language to talk about or even design the culture and governance of an organization through the SSPs and the elements of AC (P1, P2). "What you would do in order to meet those conditions [SSPs] is flat leadership structure within the organization." (P1) One idea that is mainly held by P1, P2 and S6 is the use of SSD to design how the organization functions:

> When I come to consult it's not about climate change, it's much more about the organization's resilience. […] I come back to the FSSD, because I think that it's so concise and so deep. It only depends on how deep you take it and how much you really make use of it. (P2)

P2 further elaborated how the SSPs helped her to design processes that made the organization thinking about their internal sustainability:

> When you use the social principles, you actually show how their business is doing itself, how it can be sustainable. So it can be stronger with regards to resilience when you use the principles. They are a very simple language, especially when you connect it to the actual work to show resilience. (P2)

What P2 described is clearly seen in O6. From the beginning of their SSD journey, they are focusing on the SSPs in order to create internal change as well:

> We're designing it with the social SPs, with the groups we have implemented focusing on social sustainability. They set the target first on our employees. And by applying the principles there, we will see that a company will become more resilient. (S6)

S6 also added the perspective that in the long run, focusing on the SPs won't be enough and that active capacity building is necessary to move on in the sustainability journey. For instance, S6, P6 and P4 highlighted the opportunity of understanding the importance of diversity from a systemic perspective when designing teams, but "it's really hard to get this out of the social principles" (S6). Furthermore, if organizations choose a restrictive focus (e.g. only environmental) or the context doesn't allow to touch upon the social side, practitioners cannot make use of the potential which lies in a social systems perspective (P2, P5).

Especially when talking about self-organization, the opportunity to shape governance stood out. Several practitioners touched upon this, mentioning elements of the FSSD that gave the opportunity to design more self-organizing structures: "If you take the social principles as boundary conditions, what you would do in order to meet those conditions is a flat leadership structure within the organization." (P1) P2 and P6 joined in with the same argument. Next to the SSPs, the power of questions throughout the ABCD procedure was also mentioned in this context: "If this is the future we want, what kind of organization would we create? Then maybe they would come forward and say we would create a self-organizing organization." (P1)

3.2.7. Conditions to foster AC

Several preconditions to foster AC stood out and are presented in this section. It became clear that "a framework like the FSSD won't do it alone" (P6). P6 stated that "the FSSD helps to articulate what change towards sustainability looks like but doesn't actually change culture by itself." Consequently, there might be a direct impact of the different elements of the FSSD on the AC of organizations, but P3 clarified that this is not what the FSSD is designed for. Some practitioners also raised the question whether this capacity building was due to the FSSD or only due to the focus on sustainability as a concept (P4, P5). P4 and P6 stated that resilience might be mainly about a strategic approach to sustainability.

The role of **facilitation**, the involved **people** and the **context** of the organization were repeatedly highlighted as important success factors to build AC (P1, P3, P4). Another factor that was stressed for several AC elements was a **long-term, iterative practice**. When integrating the overall landscape and insights, the participants in general sensed the potential of a strategic sustainability practice to foster AC on the long run (P4, P5, P6). "It does have the potential, but this takes time." (P5) Furthermore, commitment and training were mentioned to be helpful in building capacity:

> The big caveat is how deeply they've used it. And that is also connected to both the opportunity and the spaces that have been created for them to work with the FSSD, whether [or not] they've had some people that deeply trained it and [are] committed to using it. (P4)

P5 confirmed the importance of a long-term usage: "A lot of the things that you're looking at relate to an application over time. It relates to the practice of working with FSSD in an organization." (P5) All of the long-term use cases (O1, O2 and O5) were able to point out how

their practice helped them to foster AC, and what else helped them to do so. The focus on sustainability as a life-time journey led to a proactive approach and equipped them to endure turbulence (S2). "[O2] is ahead of the game. They popped their head out of the funnel." (P7) The short-term users (O3, O6) already saw some effects that did not yet spread throughout the organizations. Nevertheless, the sustainability champions clearly saw the potential.

Another point that was often repeated as a condition: **leadership** that encourages people to tap into their own leadership capacity and take ownership (P1, P4, S1a, S2, S7). In this context P1 and S7 talked about distributed leadership, S1b and S2 focused more on the element of empowerment. P2 recited the importance of leadership commitment and accessibility, using an example of a director who communicated openly about sustainability and thereby created a high level of trustworthiness through giving time and reference to the topic and the people.

3.3. SRQ C: levers to foster the AC of organizations through SSD

After concluding phase 2, a focus group was held online with 6 of the 7 FSSD practitioners (P1-P6). This conversation focused on SRQ C: *What are levers to foster the adaptive capacity and resilience of organizations through SSD using the FSSD?* The researchers proposed several topics: leadership, organizational development and governance, social systems perspective, and sustainability competence building. One question per topic stewarded the discussion, leaving space for the conversation to take several directions. The questions were phrased by the researchers after analyzing the data from phase 1 and 2 (see appendix F).

3.3.1. Leadership, organizational development and governance

When the theme was introduced, P6 mentioned that it is the role of the leadership of an organization to make use of the **FSSD elements** that, from his perspective, foster AC: "How can you encourage flexible thinking and long term thinking and funnel thinking [and] the backcasting perspective?" He highlighted the element of developing flexible platforms during the prioritization, increasing the "flexibility to respond to a number of different possibilities." (P6) P5 mentioned pacing as another role of leadership in fostering AC, which for him was inherent in the ROI question of the FSSD. He argued that "the role of leadership is to sense that the system as a whole has an appropriate pace." (P5) For him, another key element of leadership was to not loosen on the vision or purpose in order to please external parties: "taking that as a part of the leadership role, saying: what do we really truly believe is needed if we look at what we want to achieve, and then how we're gonna sell it."

Courage or boldness was mentioned by several practitioners. P6 argued that placing the organization in the funnel can showcase the potential unsustainable future, which also means talking about the survival of the organization. "It takes leadership to say that" (P6) because this can create anxiety and insecurity, but also motivation to act and adapt. In this sense, P1 experienced a lack of boldness and P2 highlighted the courage needed to point out "the elephant in the room". She brought in the delicate role of facilitators as catalyzers in this process, expanding comfort zones. In relation to that, P4 stressed the chance to empower the leadership on all levels through the scientific robustness of the framework that provides credible arguments. He described the FSSD as a tool for leadership: "Leadership isn't codified in the FSSD. […] it's a tool for leadership, but it isn't codified or visible." (P4) P2 elaborated on this

point of view: “I'm not sure that the FSSD is missing necessarily a headline called leadership. It's within everything. […] The principles of an adaptive system are the ones that give you the push in order to know okay where should my leadership go to.” (P2)

The element of **individual leadership** was introduced by P4: “Creating a common language and creating a way to think about the future […] is another way to help people take personal leadership.” Practicing SSD in participatory ways opens different possibilities about what can be done individually and “how perhaps they could collaborate with other people in the team. […] Something around that is changing everyone's perception of leadership in an organization.” (P4) A gap he pointed out in this regard is that it takes time to internalize the FSSD and the difficulty that comes along is “the lack of space, or the need to create the space for that deeper thinking that comes when the FSSD is presented and used.” When it comes to a distributed form or leadership, P1 highlighted that there must be the ability and competence or culture within the organization to live it up. He equated this with the capacity of using a framework like the FSSD. Furthermore, he rendered it as necessary “to be able to deal with the changes that our society is dealing with today.” (P1) P5 brought in the topic of capacity building to foster individual leadership and avoid isolation of sustainability heroes: “Do we set shared goals, do we prototype, but at the same time, are we building capacity for those people that want to take a step further […] so that they can come on board.” (P5)

P3 outlined the FSSD as a tool that gives the frame and the good questions that help an organization in the need to be adaptive. With this he bridged the gap to a broader discussion on governance and organizational development. “If we were to create an organizational development program to develop a distributed leadership model that is guided by FSSD, what would that look like?” was a question raised by P6. He appointed governance the role of codifying leadership mindsets and making them last on the long term. P5 felt poorly equipped in this field yet sensed a big potential to make use of the FSSD’s systemic approach in this term and P1 warned that governance alone is not enough without the leadership mindset.

3.3.2. Social Systems Perspective

The question if and how a social systems perspective could leverage the adaptive capacity of an organization started a controversial discussion. The practitioners who hadn’t been in touch with the recently added SSPs first reacted hesitantly and pointed out the risk of a fragmented approach. However, P2 challenged this, stating her perspective that “the whole purpose of the social SPs is to translate social adaptive capacities into the FSSD [as boundary conditions]. They have to correlate.” She pointed out the relevance of using all eight principles and how this helped highlighting how the social sustainability of the organization internally is very critical for the organization to be relevant in the future. Through this, P2 saw her role shifting towards organizational advisory what proofed helpful to create trust and also to showcase how all things are connected. She explained to frequently use a nested social systems perspective to tap into a holistic sustainability practice with organizations. P6 saw a similar potential and linked it to the B-step of the ABCD procedure. He described it as a conversational space guided by the SPs. He described that especially the SSPs “give license for people to have these conversations where without it, without this common language, they may not have the courage to do that. […] conversations about how we are not being adaptive or how we can be more adaptive, given all the knowledge that if we are undermining these principles, they're going to manifest themselves into something bad for us, either as a company or as a society.” (P6)

Nevertheless, all practitioners shared the opinion that the social side often falls short. Whereas P6 stressed the influence of the **context** and of orchestrating around it with the FSSD elements, P1 challenged this perspective:

> The rigor with which we can analyze natural systems using the FSSD is amazing. But when it comes to analyzing the social systems, it becomes a matter of context or opinion. And I think that's because we don't have the courage to even go there. Or maybe we don't have the competence. […] It shouldn't be a matter of opinion that you are doing something that is breaking the system in terms of social sustainability. (P1)

With this statement P1 describes that social sustainability often is approached in normative ways and P2 strongly agreed with his point of view: "it's not about an opinion, it's about a scientific sustainability perspective that you can add to the discussion and it kind of takes out this sting of ideology and brings it back to science." However, this was perceived as difficult. Courage and leadership are crucial. P5 linked this to the enabling scientific background: "The more we study social systems, the more complex it becomes. When putting it into practice in an organization we need to have all the knowledge we have around complex adaptive systems."

3.3.3. Sustainability competence building

The theme of sustainability competence building was only briefly touched upon due to time constraints. As soon as the question was raised, P5 linked it to ownership and commitment:

> I used to think that once people had more theoretical awareness of the principles, backcasting, ABCD etc. we would have tackled the biggest challenge. Nowadays I tend to first and foremost increase the sense of ownership and commitment towards contributing to sustainability: what is it to me? What is my sphere of influence? As long as we keep on teaching sustainability, we engage the head, and not necessarily the hands and the heart. Let us lead with the heart, learn with the hands, and then – all in balance – reflect with the head to make sure we are and stay on track. (P5)

P4 elaborated on this, bringing in the concept of behavior change: "It's not just, are we going to train you in something, it's the behavior change in a context where someone has got a task. And then you remind us to reinforce that behavior change." (P4) P3 also highlighted the importance of context in these matters.

A general lever that was stressed by P4 was a stronger community of practice to harvest and share experiences. For him, this seemed crucial regarding the effectiveness and development of the FSSD. Furthermore, he proposed a reorganization of the FSSD to make the application and the "tips and tricks" more tangible and to clearly distinct the practice from the mindset, the models and methods. "Help people peel the onion around learning about the FSSD. […] What is its logic, the reason for a framework, the reason for sustainability principles and the way to use it. All of those things are not very well organized today in my opinion." (P4)

4. Discussion

In the following paragraphs, the researchers address the MRQ *How can practicing SSD using the FSSD nurture the resilience of organizations?* The question is discussed according to the findings related to the three SRQs.

4.1. The impact of SSD using FSSD on resilience and AC in organizations

Resilience currently appears as a buzzword, also with regards to sustainability (e.g. Laurent 2018). The scientific background of the FSSD allows diving into this topic from a systemic perspective. It can help to distinct and show the interrelation between sustainability and resilience through the concept of adaptive capacity (AC) and its five key elements. Zooming in on the application in practice, SSD with the support of the FSSD is not explicitly designed to foster the AC, and thereby the resilience, of organizations, but it was found to have the potential to do so in multiple ways.

The cases of O2 and O5 indicate the impact of their sustainability journey on the resilience of the organizations, moving from reactivity to a more conscious state, and even to a proactive state that makes them benefit in many ways. These changes are presented as mindset or culture shifts of a transformative nature. Implicitly, these cases describe how the sustainability efforts relate to fostering the different elements of AC and therefore add to the resilience of the organizations as such, "popping their heads out of the funnel". Practitioners often talked about SSD's potential to contribute to the capacity to be resilient, but they rarely name them as such. The distinction between the capacity to be resilient (or: AC) and resilience itself is not obvious, what has been observed in the answers to a more general question on resilience during the interviews. The researchers conclude that the ways in which SSD fosters AC and thereby resilience are mainly indirect or at least not well-verbalized or considered. This is probably related to the fact that it is not the intent and focus of the guiding framework. This outlines the opportunity to describe the explored impact in more tangible ways as the understanding of the connection of resilience and sustainability rises.

A question that was repetitively raised over the course of the research: when it comes to resilience, what is the role of the FSSD and being strategic in comparison to general sustainability efforts? The relevance of a **strategic approach** became clear in all phases of this study: the researchers observed that the element of systems thinking, which is often facilitated through collaborative, participatory backcasting processes, supports social agents to identify the complexity of the sustainability challenge and see themselves as part of the wider social and ecological system. Organizations learn to respond and even take proactive measures. This reduces their vulnerability to unexpected risks. Especially the strategic elements of the FSSD can be highlighted when it comes to fostering AC: the FSSD is used as a decision-making tool that indicates a unique "right direction" for the organization which is framed by universal, scientific boundary conditions while considering flexibility in the prioritization. An extra portion of courage from leaders is needed to untap the potential that lies in flexible platforms, the funnel reality and the vision orientation.

When using **the frame of AC** in a more explicit way for this research, some relations between SSD and the different elements were identified directly, while others remained with open

questions. Creating alignment around envisioned futures, organizational purpose and a common, structured definition of sustainability stood out as a powerful way to foster AC, particularly for the elements of trust and common meaning. The results showed that **trust** furthermore was fostered by the narrative of the systems perspective, the backcasting mindset, and collaboration towards shared goals. The trustworthiness and scientific guidance of the framework were mentioned as helpful points that foster trust. For **common meaning**, most participants highlighted the power of a shared vision, stressing the relation to a higher purpose which is jointly activated with strategic sustainability efforts. The FSSD introduces a certain mindset that, integrated over time, is perceived as a shared language everyone can relate to. Organizational purpose was described as an anchor, grounding the organization in stormy times. When diving into living systems theory, the role of a purpose that relates to a higher good is crucial for the existence and survival of the system (Wheatley and Kellner-Rogers 1998). SDD can also have a high impact on the element of **learning**. A repetitive practice in sensing and responding, which is encouraged through backcasting seems core to foster the element. The FSSD was identified as a frame for learning that goes beyond the teaching of scientific facts. A stated precondition was a holistic use to inform thinking and acting within the system boundaries. From the perspective of capacity building for learning, practitioners could seek a better balance between teaching and prototyping. Nevertheless, the trustworthy scientific framework can support learning through a robust guidance that takes out fears and empowers users to take decisions. Self-organization and diversity seemed unfamiliar with the participants and showed the least potential to be fostered through SSD. A SSD practice often won't promote **self-organization**, also because the hierarchical structures and other structural obstacles of the current societal paradigm seem to outweigh the potential for capacity building. The insights of this study are too limited to show how far collaboration and participatory processes can lead to self-organizing structures in the whole organization. In the sample of this study, self-organization only happened in sustainability working groups and not on a whole-organization level with the exception of one case. Nevertheless, the compelling, shared, strategic goals create clear direction that has the power to support self-organization. When it comes to **diversity**, collaboration and participatory processes hold an important role. Strategically practicing sustainability requires a diversity of people from within and outside the organization and therefore invites a diversity of perspectives. Creative ideas especially can blossom in the C step of the ABCD procedure. Facilitators can use the scientific robustness of the FSSD to open up spaces for diversity. In general, practitioners and sustainability champions found it difficult to link the SSPs to the element of diversity and often perceived it as the diversity of humans that are involved in the process or employed by the organization. For several cases, the results for SRQ B indicate the interrelation and overlapping of AC elements as described by Missimer et al. (2017b).

Throughout the interviews, phrases like "it depends", "only if" or "given that" were repeated frequently and with these statements the participants outlined certain **conditions** and prerequisites to foster AC. An organizational culture that appreciates learning and is open for distributed leadership, as well as the commitment of the leadership and the empowerment of employees where mentioned more than once. The following sections will elaborate on these points more in detail. What becomes clear is that the conditional relation between SSD and AC mirrors the indicators of successful sustainability journeys as such. Practicing SSD with an impact on organizational resilience came out to have the same conditions as practicing SSD with a positive impact on society and the organization itself.

This indicates the value of reflecting on the **current application of the FSSD** as addressed in SRQ A and how the practice can be uplifted. The FSSD is mainly applied as outlined in the official guiding literature (Broman and Robèrt 2017; Robèrt et al. 2019), but crucial elements of the application (e.g. leadership, organizational change, social systems) are not well-verbalized or clarified with scientific reasoning. In practice, the FSSD is understood as an overarching and holistic storyline. The framework is perceived as robust and credible without reductions, providing a shared language to create a sustainable future for organizations and society as a whole. It thrives in adaptation and complementation: the framework is currently applied in a variety of forms and contexts and its inherent adaptive nature is perceived as a strength. Most participants highlighted how they merge the FSSD with other tools and concepts to create an adapted language people can identify with. The **systems perspective** is the overarching element of the FSSD. This worldview places the organization in the bigger picture and thereby carries the storytelling of SSD around the funnel metaphor and the sustainability journey. The stories move into practice through backcasting and the ABCD procedure, which are frequently used by practitioners. The simplicity of ABCD provides user-friendliness and clarity about next steps in the process. It is important to say that the procedure is presented as a linear process, but lives up in participation, iteration, fragmentation and adaptation. This is also stated in literature (Broman and Robèrt 2017; Robèrt et al. 2019).

It has been observed that an **iterative, spiral, long-term practice** with complementary training fosters a **learning culture** and deep integration of the framework. Successfully practicing SSD needs commitment and it takes time to implement and tailor the FSSD to the organization, going deeper with every iteration. This again links back to the potential of AC building, which has been observed to flourish under the same conditions. Yet the nature of a successful practice is only briefly described in literature (Broman and Robèrt 2017; Robèrt et al. 2019) and mainly experienced by experts and long-term users. What stood out is the lack of an articulated community of practice, guidance and cases for the application of the framework, supporting users and practitioners throughout the journey. These points also are avenues for investigation in future research. An intriguing thought inspired by a practitioner is a restructuration of the FSSD and how it is introduced, making cases and application more tangible and clearer for users on the ground.

4.2. The human-centered element as lever to foster AC

The human nature of a sustainability practice appeared as a big lever to foster AC. In all processes of SSD, human beings come together to discuss and create the future they envision. It became obvious that the combination of participative and collaborative approaches with the FSSD's ways of thinking and working is key to tap into SSD's potential to nurture AC. In this context, the role of practitioners or **facilitators** who bring the framework to the organization stands out clearly. Practitioners are artists who have the tools and understanding to design contextualized processes and knit the stories of the organization and the FSSD together by connecting specific cases to the bigger picture. There was a high resonance that the facilitation approach is a success factor of the FSSD. The perception and awareness of the facilitator influences the whole collaboration. Practitioners found themselves at their best when becoming part of the process and providing guidance on a same eye level. Time constraints and less progressive, security- and fear-driven organizational contexts limit their possibility to use all elements of the FSSD.

This links to another critical factor for a successful sustainability practice, which is also outlined in literature (see Broman et al. 2017): **leadership**. Opening up the organizational context to a strategic approach to sustainability means stepping into a visible commitment that should be embodied through role-modelling as well as motivating employees to take action for sustainability. Leaders need a vision and understanding of how to empower and encourage distributed leadership at all levels of the organization. This ability, competence and culture seems to be a major lever in SSD and also to foster AC. Furthermore, it is tightly related to a discussion on organizational development. Leadership has to clearly communicate the shared responsibility to move the organization to the other end of the funnel. Practitioners highlight this collective ownership as the main capacity for using a framework like the FSSD, yet no clear guidance on the kind of leadership needed was found in literature. The gap appears, both from a practical and scientific perspective.

An explicit explanation and training regarding the human-centered nature of SSD is understood as critical by the different users. It nevertheless is not well-verbalized, what might be related to the fact that the human side of the methodology is prone to biases and the unique capabilities of everyone involved. The researchers observed that there is no focus on **capacity building** in practicing SSD and in the FSSD itself, neither on the individual nor the organizational level. O2 and O7 stressed the importance of this element and presented how they intuitively complement the practice. There are supporting scientific frameworks like the key competencies in sustainability (Wiek, Withycombe, and Redman 2011) or the elements of AC, once verified through further studies. This can be linked back to the shared concern that, for now, the FSSD's teaching element still outweighs its potential for experiential learning.

4.3. The levers of a social systems perspective

By taking the perspective of complex adaptive social systems (CASS), the FSSD provides a **systemic understanding** of the dynamics of human systems and the transformational element of SSD. Yet, the systems perspective of the FSSD is often rendered as the one of a bird, looking at the whole socio-ecological system from above and placing the organization in there. With other words: the teaching of the FSSD describes the organization as a nested system in the wider environment, and thereby forgets to zoom in on the organization as a system itself. It rarely explicitly focuses on the human dynamics and social agents in the system that works towards changing its impact on society and environment. Doing so, however, would link back to the elements of organizational and personal development (as explored in the previous section). Related literature (Broman and Robèrt 2017; Robèrt et al. 2019) states the importance of understanding organizations as a CASS at the systems level of the 5LM and through the reality analysis (B step) in the ABCD procedure. Yet, this is not mirrored in the sustainability practices in the data set of this research. One reason might lie in the implicit use of the 5LM that is intended to help mastering the complexity of a sustainability journey. Practitioners stated the relevance of the model for their work, but most only used it in their preparation. They do not surface the 5LM in organizations when implementing the FSSD. However, this model is meant to create clarity and foster systemic understanding. Not introducing it to organizations might leave users with a lack of clarity in systems thinking. This might cause fragmented or less strategic moves (see Robèrt et al. 2019), e.g. a less strategic integration of other tools.

What is the potential of being more aware of **organizations as CASS** in a sustainability practice? What would this mean in terms of fostering AC in the organization? The social-

systemic perspective and understanding of CASS, AC and SSPs, that was added to the framework only fairly recently, is clearly still in its initial breaths. It is not well-spread and integrated throughout the community of users. SSD takes a holistic approach to environmental and social sustainability and targets the development of organizations as social systems. The practitioners considered the FSSD as an overarching framework, yet the majority of participants did not use or even know the five SSPs. Coming across this insight was unexpected to a certain extent. The SSPs were derived from AC, which describe the functioning of a CASS and this is how the researchers got to understand the FSSD in the context of their studies. The reasons might be related to the newness of the SSPs, but also to the experienced urgency regarding environmental measures (e.g. climate change (IPCC 2014)). Practitioners also address the limited timeframes and support materials to transfer their knowledge in organizational contexts as reasons. P2 was the only practitioner who coherently used and introduced the social systems perspective. She described the SSPs as a door opener to the heart of organizations. It became apparent that many practitioners and organizations seemed unable to dive deeper into a social systemic understanding. This might be a question of readiness, interest and availability or presentation of information. Conversations about social sustainability or social system health often remain in the normative realm when it comes to putting them into practice: SSPs are addressed on the surface but in the end, actions are navigated by underlying cultural or societal belief. It appears that the SSPs seem to become reductionist when not connected to the underlying system functions. Thinking further, the social systems perspective can be highlighted as an opportunity in relation to the scientific character of the FSSD.

The strong **scientific background** in general appeared as both a weakness and a strength. On the one hand it requires time and practice to integrate the FSSD and the use of jargon can be an obstacle. There is a potential to overwhelm people if the scientific language is not translated into simple language in bits and pieces. On the other hand, it levers the sustainability practice as it provides reliable guidance and empowerment for decision making. This also holds true and can be considered as an untapped potential for the social side. In the context of resilience, the external shocks, which are predicted in relation to sustainability (e.g. climate change (IPCC 2014), start to help showing the urgency of social sustainability. When integrating the power of a social-systemic understanding, one can understand how this enables an organization to survive these shocks, or: how to be more resilient. There is a clear gap in the communication between science and practice. How the social side is presented at the moment is lacking in urgency. The potential to empower deep conversations on organizational culture, governance and development towards more sustainable and resilient system states, based on a scientific discussion of the underlying system functions, is not reflected. This implies a gap of codification and embodiment of social systems science in leadership and governance towards sustainability and resilience.

4.4. Organizational development inspired by social system functions

Reflecting further, the topic of organizational development moves into the center of discussion. Organizational development seems to be critical when talking about **organizational change** and the transformation that SSD is aiming at, but it is not well-reflected in the FSSD and related literature, in particular not from a CASS perspective (Broman and Robèrt 2017; Robèrt et al. 2019). However, the FSSD is repeatedly presented as a framework that, when applied in practice, aims at **whole system transformations** and mindset shifts (Broman and Robèrt 2017; Robèrt et al. 2019) and also succeeds in it, as observed in the existing long-term cases (Smith

and Jarisch 2019; Harel et al. 2013). The elements of collaboration and participation were found to be key in this process, opening up spaces for transformational conversations. A long-term practice can result in this mindset shift over time, helping the organization to develop as a system. The adaptation of the framework to the context of the organization considers the organization where it is, aiming at a stepwise development.

In the context of codifying this mindset, the wish for a broader governance discussion that links back to the sustainability practice was vibrant in conversations with practitioners. The opportunity of addressing it from a systemic perspective emerged clearly: if we were to create an organizational development program that is guided by FSSD, what would that look like? The perspective of a social system with human dynamics and social agents thereby opens opportunities to inspire, empower and codify the understanding in organizational structures, cultures and capacity building when stepwise redesigning for sustainability and systems health. By doing so, organizations' capacity to contribute to the sustainability challenge would be furthered as such.

The opportunity to **design flourishing, resilient spaces** is untapped, and is also influenced by the current developmental stage of organizations and the structural obstacles in their environments. Nevertheless, the SSPs appeared as a good starting point for discussion. The simple question: "What organization do we want to create?" is a guiding question that has a place in an ABCD process. When using the SSPs in relation to organizational development, the discussion organically moved to AC as the underlying system functions. Yet some relations between AC and the SSPs were hard to retrieve and users did not arrive at diversity and self-organization from the SSPs. This once more indicates the potential of a more elaborated and explicit use of the CASS perspective in a sustainability practice. The researchers identified the need to verbalize and address AC directly, supporting the design efforts and the vitality of the system-under-construction.

A question that arises: is it a coincidence that both, fostering AC and practicing SSD were found successful when the practices took place in the context of a less hierarchical, open minded organizational context? A context that was rendered with words that approximate the five elements of AC (e.g. distributed leadership, learning culture, sensing and responding), a context with healthy system functions? Do organizations need a certain level of AC to be successful in SSD, a certain system functionality as fertile soil for change? What if the soil is not fertile yet? What if the seeds the FSSD sows are not planted deep enough or cannot make it without a fertilizer? For the researchers, the answer lies in the stepwise, spiral, iterative nature of the human-centered practice. The human nature of a sustainability practice is core to development and transformation, it is a fertilizer to the soil. From this perspective, the role of leadership commitment and the empowerment of employees in a participatory culture moves even further to the foreground. Not only does this link back to the key competencies for sustainability champions (Wiek, Withycombe, and Redman 2011), but even more to the functioning and nature of change processes in social systems themselves. SSD practice needs human-centered leadership and courage. Yet, it can also help to empower leaders through the scientific nature of the FSSD, both on the environmental and, in particular, the social side. The role of facilitators as catalyzers and of leaders and sustainability champions as courageous role-models stand out clearly for both, successful sustainability journeys and their potential to foster AC. But even the experts lack courage, guidance and leadership ability to address the social system functions from a similar perspective as the environmental ones and to interweave them into a discussion on organizational change and governance. Being more explicit on the application of the social

side and relating decisions back to the social system functions can empower leaders and could be fruitful for fostering both, sustainability and resilience through SSD.

4.5. Significance, validity and further implications for the audiences

The current crisis state of the world, the COVID-19 pandemic, shows the low resilience of several organizations at this moment in time: the shock equaled an existential crisis for many corporations and the economy as such (United Nations 2020; Farrer 2020; Goyal 2020), whereas there are signs that organizations that are known for their sustainability efforts survive better (Murray 2020). Next to this shock, the increasing complexity and urgency of the sustainability challenge indicate that our society and organizations have to become more adaptive as we move towards protecting our system boundaries. The funnel is tightening up. This project shows the potential of SSD using the FSSD as we need AC and resilience to survive and develop in a sustainable direction on the long term. The question here: in the face of tightening funnel walls, is it then the role of a systemic sustainability framework to address resilience and AC more directly? This study holds a high **significance** as a pioneering study to relate SSD and AC by taking a systemic, yet action-oriented stance at practicing organizations. It has the potential to open several discussions in theory and practice. One of the arising opportunities is to verbalize the link between sustainability and resilience with an action-oriented and strategic lens. Potential future research could aim at diving deeper into the presented research layout by zooming in on particular industries, cases, or elements of the FSSD or AC in a qualitative manner or start to broaden the insights, representing all members of organizations with quantitative methods. An extension of this study could focus on the relation between the resilience of organizations and its impact on successful SSD, reversing the explored causality. Related to this: sustainability journeys are described to be transformative in nature, from reactive to proactive. Future research could explore the link between mindset transformations in sustainability journeys and transformative resilience from a systemic perspective. Are the elements of AC enough to enable these leaps and just don't cover the transformational aspect from a semantic perspective? Or do social systems have transformative capacity beyond AC to leap forward? The CASS perspective proofed useful and feeds into the current development of research on organizations. There is a need for further exploration in science and practice.

One direct **implication for the audiences** of practitioners and organizations is to rethink and restructure their sustainability practice. Following an invitation to reflect on how capacity is built when practicing SSD, it was found helpful to verbalize the link to the social systems functions, not only framing the actions from a boundary conditions perspective. This shows the potential to design high-capacity systems in the process of removing structural obstacles. Yet, this requires awareness of the social-systemic background and the courage to apply it in organizational settings.

Limitations of the research outcome are related to the scope of the project and the methods. Despite efforts to scope down, the researched field is still broad, and the chosen perspective of CASS is fairly new. A limitation is the preliminary orientation in one framework, which both informed the conceptual framework and the field of study. Efforts have been made to address the ethical and normative considerations and to reflect on validity concerns.

5. Conclusion

This exploratory study investigated how practicing SSD with the FSSD can nurture the resilience of organizations. In order to do so, fourteen semi-structured interviews and a digital focus group were conducted. Three guiding sub-questions and the lens of AC proofed as a useful structure to spot relationships and patterns. Furthermore, this thesis understands organizations as CASS and thereby contributes to a current stream of research that zooms in on the functioning of organizations from a systemic perspective.

When interweaving the insights from FSSD practitioners and sustainability champions in organizations, it has been found that SSD with the support of the FSSD is not explicitly designed to foster the AC and thereby the resilience of organizations. Nevertheless, the researchers observed a big, versatile potential of the practice to do so. In general, the elements of systems thinking and backcasting which over time shape an overall mindset help to foster the elements of AC. The contribution of the strategic elements of the FSSD can also be highlighted. Reflected through the lens of AC, it stood out that the elements trust, common meaning and learning had a higher, more visible potential to be fostered by SSD in comparison to diversity and self-organization. This indicates the opportunity of a more explicit use of the social systems perspective in a sustainability practice, in order to emphasize the importance of all systems functions. The lack of this perspective is visible in the incoherent use of the SSPs in practice and the lacking understanding of organizations as social systems.

Looking at experiences in the field, certain conditions for successfully practicing SSD and fostering AC were stated several times. Examples are a committed and empowering leadership, an open culture and integration and adaptation of the sustainability practice over the longer term. A progressive organizational culture as fertile soil for change seems to be key. Therefore, the researchers see a big potential in using the CAS perspective to inspire a wider discussion on organizational development and leadership backed up by the recent scientific developments. The human-centeredness of a sustainability practice adds complexity, fragility and uncertainty. Yet, it also unfolds the intangible potential of transformation and development as organizations go through change processes. The role of leadership commitment and the empowerment of employees in a participatory culture was highlighted several times. The role of facilitators as catalyzers, and leaders as role-models stand out clearly, yet even the experts lack courage and guidance to address the topic of social system functions and change from a similar perspective as the environmental ones. Being more explicit about the scientific background empowers leaders and could be fruitful for both, fostering sustainability and resilience through SSD.

This research presents the relevance of looking into organizations' SSD through the lens of AC. Perceiving organizations as CASSs proofs insightful, not only when it comes to understanding how practicing sustainability can nurture the resilience of organizations, but also regarding the change processes organizations go through in their sustainability journeys. Following this avenue of research, future studies could further explore or validate the analyzed relationships or dive deeper into the topic of social system functions. The increasing uncertainty and complexity of the sustainability challenge give unmistakable clues on the importance to further our understanding, and to smartly apply these topics in our design choices in organizations and society. The COVID-19 pandemic, which accompanied the course of this research with a tangible case of crisis state, indicates humanity's potential to address big challenges and how resilience is not only a buzzword but a necessary consideration if we strive to co-exist on this planet on the long term.

References

Ackoff, Russell L. 2006. 'Why Few Organizations Adopt Systems Thinking'. *Systems Research and Behavioral Science* 23 (5): 705–8. https://doi.org/10.1002/sres.791.

Aktaş, Esra, Işık Çiçek, and Mithat Kıyak. 2011. 'The Effect Of Organizational Culture On Organizational Efficiency: The Moderating Role Of Organizational Environment and CEO Values'. *Procedia - Social and Behavioral Sciences* 24: 1560–73. https://doi.org/10.1016/j.sbspro.2011.09.092.

Amnesty International. 2009. 'Amnesty International Report 2009: The State of the World's Human Rights'. London: Amnesty International.

Andersson, Claes. 2014. 'Complexity Science and Sustainability Transitions'. *Environmental Innovation and Societal Transitions* 11 (2014): 50–53. https://doi.org/10.1016/j.eist.2014.03.001.

Benyus, Janine M. 2008. *Biomimicry: Innovation Inspired by Nature*. New York: Harper Perennial.

Berns, Maurice, Andrew Townend, Zayna Khayat, Balu Balagopal, Martin Reeves, Hchael S. Hopkins, and Nina Kruschwitz. 2009. 'The Business of Sustainability: What It Means to Managers Now'. *MIT Sloan Management Review* 51 (1): 20–26.

Broman, Göran, Terrence J. Collins, Rupert J. Baumgartner, Tobias Larsson, Donald Huisingh, and Karl-Henrik Robèrt. 2017. 'Science in Support of Systematic Leadership towards Sustainability'. *Journal of Cleaner Production* 140: 1–9. https://doi.org/10.1016/j.jclepro.2016.09.085.

Broman, Göran, and Karl-Henrik Robèrt. 2017. 'A Framework for Strategic Sustainable Development'. *Journal of Cleaner Production* 140 (Part 1): 17–31. https://doi.org/10.1016/j.jclepro.2015.10.121.

Brunckhorst, David J. 2002. 'Institutions to Sustain Ecological and Social Systems'. *Ecological Management and Restoration* 3 (2): 108–16. https://doi.org/10.1046/j.1442-8903.2002.00102.x.

Bryman, Alan. 2012. *Social Research Methods*. 4th ed. New York: Oxford University Press.

Castellani, Brian, and Frederic William Hafferty. 2009. *Sociology and Complexity Science: A New Field of Inquiry*. Berlin, Heidelberg: Springer Verlag. https://doi.org/10.1007/978-3-540-88462-0.

Cezarino, Luciana Oranges, Flavio Hearnoux Junior, and Hamilton Luiz Correa. 2012. 'Organization Performance Evaluation Using System Thinking: A Study in Brazilian Chemical Organizations Models'. *Systemic Practice and Action Research* 25 (1): 81–92. https://doi.org/10.1007/s11213-011-9198-4.

Clayton, Anthony M.H., and Nicholas J. Radcliffe. 1996. *Sustainability: A Systems Approach*. London: Earthscan. https://doi.org/10.4324/9781315070711.

Conrad, Christian, and Marjorie Ellis Thompson. 2013. *The New Brand Spirit: How Communicating Sustainability Builds Brands, Reputations and Profits*. London: Routledge.

Daft, Richard L., and Arie Y. Lewin. 1993. 'Where Are the Theories for the "New" Organizational Forms? An Editorial Essay'. *Organization Science* 4 (4): i–vi.

Eisenberg, Eric M., Angela Trethewey, Marianne LeGreco, and H. L. Goodall Jr. 2016. *Organizational Communication: Balancing Creativity and Constraint*. Eighth edition. Boston: Bedford/St Martin's.

Ellis, Erle C., and Navin Ramankutty. 2008. 'Putting People in the Map: Anthropogenic Biomes of the World'. *Frontiers in Ecology and the Environment* 6 (8): 439–47. https://doi.org/10.1890/070062.

Farrer, Martin. 2020. 'Coronavirus Credit Crunch Could Make 2008 Look like "Child's Play"'. *The Guardian*, 20 March 2020. https://www.theguardian.com/world/2020/mar/20/coronavirus-crisis-could-lead-to-new-credit-crunch-as-companies-struggle-with-debt.

Folke, Carl, Johan Colding, and Fikret Berkes. 2002. 'Synthesis: Building Resilience and Adaptive Capacity in Social–Ecological Systems'. In *Navigating Social-Ecological Systems*, edited by Fikret Berkes, Johan Colding, and Carl Folke, 1st ed., 352–87. Cambridge University Press. https://doi.org/10.1017/CBO9780511541957.020.

Giddens, Anthony. 1990. *The Consequences of Modernity*. Oxford: Wiley. http://public.eblib.com/choice/publicfullrecord.aspx?p=1184142.

———. 1991. *Modernity and Self-Identity: Self and Society in the Late Modern Age*. Stanford: Stanford University Press.

Goyal, Malini. 2020. 'Covid-19: How the Deadly Virus Hints at a Looming Financial Crisis'. *The Economic Times*, 22 March 2020. https://economictimes.indiatimes.com/news/economy/finance/covid-19-crisis-how-the-deadly-virus-hints-at-a-looming-financial-crisis/articleshow/74752200.cms?from=mdr.

Harel, Tamar, Geanne van Arkel, Freek van der Pluijm, and Berend Aanraad. 2013. 'Interface: The Journey of a Lifetime...' The Natural Step.

IPCC. 2014. 'Summary for Policymakers'. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (Eds.)]. United Kingdom and New York: Cambridge University Press.

Jonker, Jan. 2000. 'Organizations as Responsible Contributors to Society: Linking Quality, Sustainability and Accountability'. *Total Quality Management* 11 (4–6): 741–46. https://doi.org/10.1080/09544120050008156.

Kayes, Christopher D. 2015. *Organizational Resilience: How Learning Sustains Organizations in Crisis, Disaster, and Breakdown*. Oxford; New York: Oxford University Press.

Klinger, Eric. 1998. 'The Search for Meaning in Evolutionary Perspective and Its Clinical Implications'. In *The Human Quest for Meaning: A Handbook of Psychological Research and Clinical Applications*, edited by Paul T. P. Wong, 27–50. Routledge.

Laurent, Éloi. 2018. *Measuring Tomorrow: Accounting for Well-Being, Resilience, and Sustainability in the Twenty-First Century*. Oxford: Princeton University Press.

Linnenluecke, Martina, and Andrew Griffiths. 2010. 'Beyond Adaptation: Resilience for Business in Light of Climate Change and Weather Extremes'. *Business & Society* 49 (3):

477–511. https://doi.org/10.1177/0007650310368814.

Max-Neef, Manfred A. 1991. *Human Scale Development: Conception, Application and Further Reflections*. New York: The Apex Press.

Maxwell, Joseph Alex. 2013. *Qualitative Research Design: An Interactive Approach*. 3rd ed. v. 41. Thousand Oaks: SAGE Publications.

McCartney, Matthew, Max Finlayson, and Sanjiv de Silva. 2015. 'Sustainable Development and Ecosystem Services'. Brief for GSDR 2015. https://sustainabledevelopment.un.org/content/documents/629475-McCartney-Sustainable%20development%20and%20ecosystem%20services.pdf.

Miller, John H., and Scott E. Page. 2007. *Complex Adaptive Systems: An Introduction to Computational Models of Social Life*. Princeton: Princeton University Press. http://site.ebrary.com/id/10364762.

Missimer, Merlina. 2013. 'The Social Dimension of Strategic Sustainable Development'. PhD dissertation, Karlskrona: Blekinge Institute of Technology. http://urn.kb.se/resolve?urn=urn:nbn:se:bth-00555.

Missimer, Merlina, Karl-Henrik Robèrt, and Göran Broman. 2017a. 'A Strategic Approach to Social Sustainability – Part 1: Exploring the Social System'. *Journal of Cleaner Production* 140 (Part 1): 32–41. https://doi.org/10.1016/j.jclepro.2016.03.170.

———. 2017b. 'A Strategic Approach to Social Sustainability – Part 2: A Principle-Based Definition'. *Journal of Cleaner Production* 140 (Part 1): 42–52. https://doi.org/10.1016/j.jclepro.2016.04.059.

Murray, James. 2020. 'HSBC: Companies Focused on Climate Change "outperformed" as Virus Spread'. GreenBiz. Accessed May 25, 2020. https://www.greenbiz.com/article/hsbc-companies-focused-climate-change-outperformed-virus-spread.

Naber, Andrew. 2020. 'One Third of Your Life Is Spent at Work'. Gettysburg College. Accessed May 13, 2020. https://www.gettysburg.edu/news/stories?id=79db7b34-630c-4f49-ad32-4ab9ea48e72b&pageTitle=1%2F3+of+your+life+is+spent+at+work.

OECD. 2005. 'Glossary of Statistical Terms'. OECD Glossary of Statistical Terms. Accessed May 28, 2020. https://stats.oecd.org/glossary/detail.asp?ID=3123.

Olsson, Per, Victor Galaz, and Wiebren J. Boonstra. 2014. 'Sustainability Transformations: A Resilience Perspective'. *Ecology and Society* 19 (4). https://doi.org/10.5751/ES-06799-190401.

Pryshlakivsky, Jonathan, and Cory Searcy. 2013. 'Sustainable Development as a Wicked Problem'. In *Managing and Engineering in Complex Situations*, edited by Samuel F. Kovacic and Andres Sousa-Poza, 21:109–28. Dordrecht: Springer Netherlands. http://link.springer.com/10.1007/978-94-007-5515-4_6.

Robèrt, Karl-Henrik, Göran Broman, David Waldron, Henrik Ny, Sophie Hallstedt, David Cook, Lena Johansson, et al. 2019. *Sustainability Handbook*. Lund: Studentlitteratur.

Robèrt, Karl-Henrik, B. Schmidt-Bleek, J. Aloisi de Larderel, G. Basile, J.L. Jansen, R. Kuehr, P. Price Thomas, M. Suzuki, P. Hawken, and M. Wackernagel. 2002. 'Strategic Sustainable Development — Selection, Design and Synergies of Applied Tools'. *Journal of Cleaner Production* 10 (3): 197–214. https://doi.org/10.1016/S0959-6526(01)00061-0.

Scharmer, Claus Otto. 2009. *Theory U Leading from the Future as It Emerges*. San Francisco:

Berrett-Koehler Publishers. http://www.books24x7.com/marc.asp?bookid=42600.

Schmidt, Christoph M., Anette Stilz, and Klaus F. Zimmermann. 1994. 'Mass Migration, Unions, and Government Intervention'. *Journal of Public Economics* 55 (2): 185–201. https://doi.org/10.1016/0047-2727(94)90051-5.

Scoones, Ian, Melissa Leach, Adrian Smith, Sigrid Stagl, Andy Stirling, and John Thompson. 2007. 'Dynamic Systems and the Challenge of Sustainability'. STEPS Working Paper, No.1. Brighton: STEPS Centre.

Senge, Peter M., Bryan Smith, Nina Kruschwitz, Joe Laur, and Sara Schley. 2008. *The Necessary Revolution: How Individuals and Organizations Are Working Together to Create a Sustainable World*. New York: Doubleday.

Shrivastava, Paul. 2014. 'Special Volume on Organizational Creativity and Sustainability: Theme "Paths for Integrating Creativity and Sustainability"'. *Journal of Cleaner Production* 79: 4–6. https://doi.org/10.1016/j.jclepro.2014.06.015.

Smith, N. Craig, and Dawn Jarisch. 2019. 'INEOS ChlorVinyls: A Positive Vision for PVC (A)'. In *Managing Sustainable Business: An Executive Education Case and Textbook*, edited by Gilbert G. Lenssen and N. Craig Smith, 83–102. Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-024-1144-7.

Solé, Ricard V., David Alonso, and Joan Saldaña. 2004. 'Habitat Fragmentation and Biodiversity Collapse in Neutral Communities'. *Ecological Complexity* 1 (1): 65–75. https://doi.org/10.1016/j.ecocom.2003.12.003.

Spaiser, Viktoria, Shyam Ranganathan, Ranjula Bali Swain, and David J. T. Sumpter. 2017. 'The Sustainable Development Oxymoron: Quantifying and Modelling the Incompatibility of Sustainable Development Goals'. *International Journal of Sustainable Development & World Ecology* 24 (6): 457–70. https://doi.org/10.1080/13504509.2016.1235624.

Stebbins, Robert Alan. 2008. 'Exploratory Research'. In *The SAGE Encyclopedia of Qualitative Research Methods*, by Lisa Given. Thousand Oaks California: SAGE Publications, Inc. https://doi.org/10.4135/9781412963909.n166.

Steffen, W., K. Richardson, J. Rockstrom, S. E. Cornell, I. Fetzer, E. M. Bennett, R. Biggs, et al. 2015. 'Planetary Boundaries: Guiding Human Development on a Changing Planet'. *Science* 347 (6223): 1259855/1-1259855/10. https://doi.org/10.1126/science.1259855.

Steffen, Will, Regina Angelina Sanderson, Peter D. Tyson, Jill Jäger, Pamela A. Matson, Berrien Moore III, Frank Oldfield, et al. 2005. *Global Change and the Earth System: A Planet under Pressure*. Berlin, Heidelberg, New York: Springer.

Stork, Nigel E. 2010. 'Re-Assessing Current Extinction Rates'. *Biodiversity and Conservation* 19 (2): 357–71. https://doi.org/10.1007/s10531-009-9761-9.

Thompson, Karl. 2016. 'What Percentage of Your Life Will You Spend at Work?' Revise Sociology. Accessed May 13, 2020. https://revisesociology.com/2016/08/16/percentage-life-work/.

United Nations. 2009. 'The Millennium Development Goals Report 2009'. New York: United Nations. https://www.un.org/millenniumgoals/pdf/MDG_Report_2009_ENG.pdf.

———. 2020. 'Shared Responsibility, Global Solidarity: Responding to the Socio-Economic Impacts of COVID-19'. https://www.un.org/sites/un2.un.org/files/sg_report_socio-economic_impact_of_covid19.pdf.

United Nations Development Programme. 2020. ‘Sustainable Development Goals’. Accessed May 20, 2020. https://www.undp.org/content/undp/en/home/sustainable-development-goals.html.

Vancouver, Jeffrey B. 1996. ‘Living Systems Theory as a Paradigm for Organizational Behavior: Understanding Humans, Organizations, and Social Processes’. *Behavioral Science* 41 (3): 165–204. https://doi.org/10.1002/bs.3830410301.

Wahl, Daniel Christian. 2006. ‘Design for Human and Planetary Health: A Transdisciplinary Approach to Sustainability’. In *Management of Natural Resources, Sustainable Development and Ecological Hazards*, I:285–96. Bariloche, Argentina: WIT Press. https://doi.org/10.2495/RAV060281.

———. 2016. *Designing Regenerative Cultures*. Axminster: Triarchy Press.

Walker, Brian, C. S. Holling, Stephen R. Carpenter, and Ann P. Kinzig. 2004. ‘Resilience, Adaptability and Transformability in Social-Ecological Systems’. *Ecology and Society* 9 (2). https://doi.org/10.5751/ES-00650-090205.

Westley, Frances R., Ola Tjornbo, Lisen Schultz, Per Olsson, Carl Folke, Beatrice Crona, and Örjan Bodin. 2013. ‘A Theory of Transformative Agency in Linked Social-Ecological Systems’. *Ecology and Society* 18 (3). https://doi.org/10.5751/ES-05072-180327.

Wheatley, Margaret J., and Myron Kellner-Rogers. 1998. *A Simpler Way*. San Fransisco: Berret-Koehler Publishers.

Wiek, Arnim, Lauren Withycombe, and Charles L. Redman. 2011. ‘Key Competencies in Sustainability: A Reference Framework for Academic Program Development’. *Sustainability Science* 6 (2): 203–18. https://doi.org/10.1007/s11625-011-0132-6.

World Bank. 1992. *Development and the Environment*. World Development Report 1992. Oxford: Oxford University Press.

———. 2020. ‘Poverty & Equity Data Portal’. Accessed March 2, 2020. http://povertydata.worldbank.org/poverty/home/.

World Commission on Environment and Development. 1987. *Our Common Future*. Oxford: Oxford University Press.

WWF. 2010. ‘Living Planet Report 2010: Biodiversity, Biocapacity and Development’. London: Arthur Steen Horne Adamson.

Yin, Robert K. 2014. *Case Study Research: Design and Methods*. Fifth edition. Los Angeles: SAGE.

Appendices

Appendix A: the sustainability principles

Sustainability principles (Broman and Robèrt 2017)
Ecological sustainability principles In a sustainable society, nature is not subject to systematically increasing... **SP1** ... concentrations of substances extracted from the Earth's crust; **SP2** ... concentrations of substances produced by society; **SP3** ... degradation by physical means;
Social sustainability principles and people are not subject to structural obstacles to... **SP4** ... health - physically, mentally and emotionally; **SP5** ... influence; **SP6** ... competence; **SP7** ... impartiality; **SP8** ... meaning-making.

Appendix B: the ABCD procedure

Step Awareness (Envisioning the future)	The procedure starts with **step A**, defining an envisioned future within the boundaries of the SPs. Alongside the envisioned future and audacious long-term goals, the core ideology of the organization in the form of organizational values and purpose is clarified. Defining a vision with a stable core and flexible parts thereby brings more flexibility and creativity to the process. (Broman and Robèrt 2017)
Step Baseline (Current Reality)	**Step B** invites to look at the current reality. The internal operations and flows, as well as the in- and outputs of the organization are mapped. All activities of the organization are assessed through the lens of the vision and the SPs. (Broman and Robèrt 2017)
Step Compelling Vision (Ideation solutions to challenges)	**Step C** is about diverging possible actions towards the defined goal. This brainstorming of ideas can range from directly implementable solutions to very creative, currently not feasible actions that might be of value in the future. (Broman and Robèrt 2017)
Step Deciding on Priorities (Prioritization/Strategy)	**Step D** consists of prioritizing and deciding on the action elements for the generation of a strategic action plan. This step makes use of three strategic guidelines which are also introduced on the strategic level of the 5LM: the alignment of the action's direction regarding the defined vision, the flexibility of the action as a strategic platform, and return on investment. Depending on the organization, more tailor-made and context-relevant strategic guidelines for prioritization might be defined. (Broman and Robèrt 2017)

Appendix C: simplified definitions of the five elements of adaptive capacity

Element of AC	Definition used in interviews
Trust	The attitude enabling people to rely on each other and formulate a positive expectation towards one another.
Learning	The capacity that allows humans and systems to continuously sense, develop and prototype responses to changing environments, individually and together.
Diversity	A variety of ideas and responses to a changing environment.
Self-organization	The coordination of processes, ideas or projects that develops from local interactions between colleagues.
Common meaning	Humans' desire to work towards a shared, higher purpose and express themselves individually and as a group.

Appendix D: FSSD practitioners interviewed in phase 1

P1 is a senior sustainability advisor in Sweden. Next to SSD, his main focus is on leadership development for multiple forms of organizations. The practitioner who nowadays works on multiple projects around sustainability and transformative leadership used to work with infrastructure development, quality and environmental management systems, development programs for various communities through Local Agenda 21, and civil society programs. He uses the FSSD because the approach provides a clear definition of sustainability and a systematic approach to sustainable development.
P2 does strategic sustainability consulting for organizations that wish to integrate economic value with social and environmental sustainability in Israel. After graduating from MSLS in 2013, the practitioner worked for two sustainability-related NGOs before starting her own consultancy in Israel. She has a background in economics and business development.
P3 accelerates change towards sustainability for 20 years in different continents and settings. Most of his work since graduating from MSLS in 2005 has been with or influenced by the FSSD. He explored, used, adapted, and bent it for many different contexts: secondary school students, multinational executives, MBAs, small SME's owner and his employees, etc. P3 has been described as creatively challenging the status quo, as an inspiring teacher and smooth facilitator, and as "finally making the concept of sustainability understandable".
P4 is a sustainability advisor, analyst, process leader and speaker in Sweden. He has over 15 years of experience addressing a broad range of environmental, social and business topics in numerous sectors. His focus is helping organizations to 'backcasting from success', using the FSSD as a main guidance. The practitioner is engaged in fostering the community around the FSSD practitioners and sees a strong value in further developing the framework.
P5 works as an organizational development advisor, sustainability literacy trainer, and social entrepreneur in the Netherlands, in which the FSSD has acted as a backbone for all of his work. After graduating from a Masters in Strategic Leadership towards Sustainability well over a decade ago, he worked at, founded and managed NGO's and for-profit advisory firms in pursuit of making lasting impact in increasingly complex settings.
P6 is a sustainability advisor at a sustainability consultancy in Canada and a senior associate with The Natural Step Canada. He has over 15 years of experience in supporting businesses, communities and organizations with integrated sustainability planning and educating and delivering hundreds of presentations and training workshops on the theme of sustainability, change, organizational learning and strategy. Most recently, he was program director of the Master's in Strategic Leadership Towards Sustainability program at the Blekinge Institute of Technology in Sweden.
P7 works on national and international programs with individuals and organizations that are engaged in the transition towards sustainable societies with a renewed understanding of prosperity. Her focus is on developing and facilitating transformation paths, empowering people and organizations to navigate the challenges of un-sustainability whilst taking care of their uniqueness. She does this by combining the FSSD, Max-Neef's Human Needs framework and story-telling practices. She has a background in sustainable economy and bioengineering.

Appendix E: organizations and sustainability champions interviewed in phase 2

Industries covered by the sample of organizations are food, PVC, agriculture (biological systems), environmental protection and flooring. In the context of this research, organizations are considered as

- small-size, when employing less than 50 employees,
- medium-size, when employing between 50 and 250 employees and,
- big-size, when employing more than 250 employees (derived from OECD 2005).

The sample of this research covered one small-size organization, one mid-size organization and four big-size organizations.

O1 is a Swedish family-owned mid-size organization in the food-sector with around 300 employees. Introducing the FSSD in 2011, the organization started to become more strategic on their sustainability journey and has been using backcasting processes on multiple different levels ever since. The approach is deeply integrated in their way of thinking and the main means of how to get closer to success in four core areas that are framed by the eight sustainability principles. Through practicing strategic sustainable development, the organization already reached several of their goals, eg. drastically reducing plastics from their operations, producing their own energy or using trains for their products. S1a is the head of innovation, being responsible for bringing the FSSD to the company and moving it strategically towards sustainability, together with a wider team. S1b is the CEO of the organization while also stewarding a network of Swedish organizations that practice SSD.
O2 is an international company in the flooring business with operations worldwide. At the end of 2019 they employed a total of 4,110 employees. The company started its sustainability journey in the early 90s with a first project group around sustainability, focusing on environmental issues. Early in their sustainability journey they came across The Natural Step and the FSSD, which has been shaping their approach ever since in combination with biomimicry. This way of thinking has become deeply embedded in their company culture. Nowadays, the company moves towards being restorative and has a production line that is completely free of the use of fossil fuels. S2 has been working at this company for 17 years, and 11 years in the field of sustainability. In 2020 she left the company and will continue being an ambassador for sustainability on other fronts.
O3 is a Swedish family-owned group with several sub-organizations in the food-sector. Being an organization with origins in the 16th century and therefore very home-bound with a natural understanding of sustainability, the organization started to become more strategic on their sustainability journey by introducing the FSSD in 2019. They have been using backcasting processes on multiple different levels. The sustainability principles are routinely used by the sustainability management and the group-wide sustainability working group that is made up from top-level managers. The organization is in an ongoing ABCD procedure to put their strategic goals into practice. The use of the framework has been communicated one year ago and will be spread proactively to the different layers of the organization in the following years. S3 works as a head of sustainability for the whole group.
O5, a big-size company with around 5000 employees, is one of the main drivers of the sustainability journey of the whole PVC industry. Starting in the early 90's, an external crisis forced the company to rethink the ways the industry works and tap into action. Ever since, the FSSD is a companion, not only of the organization itself, but of the whole industry, moving it strategically towards sustainability on the European level. Being a chemical-focused industry, the FSSD resonates on a wider level through the scientific language and the strategic decision-making support. The organization and the industry have been running several ABCD processes over several years. S5, the former sustainability

director, has been involved in the journey since 1999 and is very supportive of the FSSD. He mainly shared the story of this organization, but also broadened the discussion on the level of the whole industry, being one of the driving forces for the creation of a multi-stakeholder network for strategic sustainable development.
O6 is a big-size company that produces sustainable cultivation solutions for food crops and ornamental plants. It has over 1300 employees, is operational in at least 26 countries and is growing quick. The company started its sustainability journey in 2014 with a sustainability week, presenting their new logo and mission. After this initial ambition, it was only in 2017 that they started working with lifecycle assessments for their products. In 2018 the Sustainability Innovator and packaging designer, S6, came back from studying MSLS in Karlskrona and they started to write a sustainability strategy for the company with the help of the FSSD. Since a year they apply a backcasting approach and the ABCD procedure. At the moment smaller focus groups are using this procedure to make plans and they are about to present the results. After these presentations, they will be brought together and presented to the board of directors in order to decide how to move forward from there. The definitions of success and end goals that are defined by the ABCD procedures are currently being integrated into the business case of the company.
O7 is an environmental federation. It is a small-size NGO with 9 employees. S7 joined the organization 3 years ago in a moment of deep existential crisis, taking the role of the director and starting to reinvent the organization as a whole. Through a process of deep inquiry, team building and starting a practice of strategic sustainable development using the core elements of the FSSD, the organization clarified its purpose, a roadmap and new, less hierarchical structures that move them towards sustainability. Leadership and facilitation are core topics for the interviewee. Backcasting is one of the core procedures used in several different contexts which are always framed by the principles, even if the FSSD as a framework never has been introduced as such.

Appendix F: interview guide and questions

Interviews phase 1	
Purpose:	Strategic Sustainable Development (SSD) practitioners using the Framework for Strategic Sustainable Development (FSSD) were contacted and interviewed with the following purpose: • to gain knowledge about their perspective on the current application of the FSSD, • to gain knowledge about how they would relate the practice to the five essential aspects of adaptive capacity, • to ask them if they know possible organizations that successfully used elements of the FSSD and might be willing to participate in this study.
Set-up:	• Format: one-on-one interviews, one interviewee, one interviewer and one observer from the research team • Tool: Zoom • Confidentiality/Recording: A consent form was handed out and collected before the interview took place. The interviewees were reminded once again before the recording started. • Timing: 60 min – 90 min
Exemplary interview questions:	• What's the essence of the FSSD when it's applied in organizations? • What would you consider as the core elements of the FSSD you use in most contexts? How would you describe going through SSD as an organization? • What are strengths and weaknesses of the FSSD when you apply it in an organization? • Does applying the FSSD influence the culture and the ways of working in an organization? • Does it make the organization more resilient? If so, how? • From your experience, does the FSSD help to build [AC element] in an organization? If so, what elements of the FSSD do you relate it to?

Interviews phase 2	
Purpose:	Representatives from organizations using the Framework for Strategic Sustainable Development (FSSD) were contacted and interviewed with the following purpose: • to gain knowledge about their use of the FSSD, • to gain insights and perspectives about how and if their practice influenced the five aspects of adaptive capacity, • to widen the understanding with an internal perspective on the influence of using the FSSD on the AC/resilience,
Set-up:	• Format: one-on-one interviews, one interviewee, one interviewer and one observer from the research team • Tool: Zoom • Confidentiality/Recording: A consent form was handed out and collected before the interview took place. The interviewees were reminded once again before the recording started. • Timing: 60 min – 90 min
Exemplary interview questions:	• Could you introduce us quickly to the sustainability journey of your organization? • How do or did you use the FSSD in your organization and for how long? • How have you been introduced to it? How did you adapt it over time? • Talking about the human dynamics and culture of the organization, have there been changes you observed since you started your sustainability journey? What gets the credit for this change? • Do you think that practicing sustainable development helps your organization to become more resilient? If so, how? • From your experience, does practicing strategic sustainable development help to foster [AC element] in your organization? Are there any concepts, processes or methods you would relate to that?

Focus group phase 3	
Purpose:	The FSSD from phase 1 joined a focus group with the following purpose: • to explore some levers within the sustainability journey of organizations in order to foster adaptive capacity • to plant seeds and share questions that spark a change in their practice.
Set-up:	• Format: six practitioners in conversations, guided by three researchers • Tool: Zoom • Confidentiality/Recording: A consent form was handed out and collected before the interview took place. The interviewees were reminded once again before the recording started. • Timing: 90 min
Exemplary interview questions:	• Overarching question: What are levers to foster organizations' adaptive capacity through strategic sustainable development using the FSSD? • What is the role of leadership in an organization for fostering its' adaptive capacity through strategic sustainable development? Feel free to frame your reflections as possible gaps and opportunities related to the sustainability practice. • What is the role of organizational development and governance for fostering an organization's adaptive capacity through strategic sustainable development? Feel free to frame your reflections as possible gaps and opportunities related to the sustainability practice. • How can Social Sustainability and working with Social SPs be a gap or an opportunity to foster organizations' adaptive capacity through strategic sustainable development? • How should Sustainability competence building, and activation look like in order to foster organizations' adaptive capacity? Feel free to frame your reflections as possible gaps and opportunities related to the sustainability practice.

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