Eindhoven University of Technology

MASTER

Leadership in the destabilization phase of sustainability transitions

A case study of a transition-oriented project in the Dutch agrifood system

van Veghel, L.H.A.

Award date:
2021

Link to publication

Master thesis

Leadership in the destabilization phase of sustainability transitions:
A case study of a transition-oriented project in the Dutch agrifood system

L.H.A. van Veghel

Student number 0887973

Innovation Sciences

Department of Industrial Engineering & Innovation Sciences

Eindhoven University of Technology

Final version

Supervisors:

Dr. Ir. F.C.A. Veraart – Department of Industrial Engineering & Innovation Sciences

Dr. J.I. Höffken – Department of Industrial Engineering & Innovation Sciences

Prof. Dr. F. Alkemade – Department of Industrial Engineering & Innovation Sciences

August 9, 2021

Abstract

In contemporary transition literature, the role of leadership has been underexposed. In this thesis, I study the role of promising approaches to leadership in transition-oriented projects in the destabilization of regimes phase of sustainability transitions and hypothesize how such leadership can be stimulated. I conduct a multimethod analysis in which a case study is analysed. Through a coding process of the leadership exhibited in the network meetings organised in the case study and conducting complementary interviews, I assess if and which form(s) of leadership was exhibited.

Based on this, I develop a new form of collaborative agency, called transition-oriented leadership, through which actors in transition projects can undertake six types of action: create and align shared visions, develop new networks/coalitions, engage in institutional work, adopt innovations, convince own organisations of change and collaborate with other actors. Transition-oriented leadership comprises exhibiting four approaches to leadership: personal leadership, transformational leadership, collaborative leadership and institutional leadership. The six types of actions and the four approaches to leadership are synthesized in a transition-oriented leadership framework.

I further hypothesize this approach to leadership can be stimulated through avoidance of discussion on management, stimulation of discussion on obstacles, the selection of the right actors with strengths, capacities and positions allowing them to exhibit certain approaches to leadership, and by making active use of facilitators and guiding questions.

Summary

Within contemporary transition studies, specifically within understanding transitions, a number of knowledge gaps exist. Little research has been done on transition phases (See Lodder et al., 2017) past the first phase, for instance on the destabilization of regimes phase. Similarly, little research has been done on the role of leadership in sustainability transitions, bare the work of Grin et al. (2018) and implicit descriptions of leadership in for instance transition management (See vision in Loorbach, 2007). Here, I aim to create more insight in these knowledge gaps by answering the following research question:

> *What is the role of promising approaches to leadership in transition-oriented projects in the destabilization of regimes phase of sustainability transitions and how can this leadership be stimulated?*

To answer this question, I developed an initial framework of transition-oriented leadership that can help in understanding the role of leadership in transition-oriented projects in the destabilization of regimes phase of sustainability transitions. Furthermore, I developed a methodology to assess leadership in sustainability transitions and made a number of observations on how one can stimulate leadership in transitions.

Methods: In order to answer the research question, I used a multimethod research design. As a first step, a literature study was carried out to develop a scientifically based understanding of how leadership fits in sustainability transitions literature, what types of actions in destabilization of regimes can be executed through leadership, and what leadership theories (approaches to leadership) are most promising in contributing to the execution of these types of action. I then synthesized the results in a transition-oriented leadership framework.

Next, I assessed a case study in the Dutch agrifood system (Transition Space project), done by means of a multimethod qualitative analysis. Within the Transition Space project a number of network meetings have been organized in multiple actors from within the Dutch agrifood system came together to discuss a vision for the future of the Dutch agrifood system and corresponding actions. Based on the transition-oriented leadership framework, I developed a predetermined codebook detailing which behaviours expressed in the network meetings show indications of leadership being displayed, which I complemented with emerging codes while analysing the network meetings. Analysis has been done by searching for leadership that was exhibited and labelling these instances with their corresponding codes.

To complement this data with information on leadership exhibited before and after the network meetings, I also conducted three interviews with project partners. These semi-structured interviews revolved around questions regarding actor positioning; personal leadership; leadership in the Transition Space project; and feedback towards the actor's organisation.

For this, I used a number of validation strategies: (1) using multiple data sources and perspectives, (2) running initial results by participants to check for inaccuracies, and (3) engaging in self-reflection and documenting bias. Similarly, reliability was increased through an iterative process of going back and forth between network meetings and interviews each time a new insight was gained, avoiding drift.

Literature study: I reframed leadership in sustainability transitions as a form of collaborative agency, with collaborative agency being defined as: actors coming together and interacting to coordinate their activities, potentially changing their own activities.

Leadership in sustainability transitions

Using leadership literature, I developed a definition of transition-oriented leadership, based on both social and personal leadership. Social leadership is "A process through which an individual influences a group of individuals to achieve a common [shared vision]" (Northouse, 2019, p.5), whereas personal leadership involves actors defining a personal vision and actions towards it for their own life (Covey, 1989). Based on these notions, the definition of transition-oriented leadership is:

> *Leadership in sustainability transitions entails two interrelating forms of leadership. Individual actors exhibit personal leadership to develop a personal vision and a broad range of actions they can take towards it based on their strengths. They use this knowledge to exhibit social leadership in settings of collaborative agency to influence oneself and others to develop a shared vision and take action to move towards the shared vision with the intention to improve the current system through changing the structures of the system and adapting to these changes. Transition-oriented leadership entails the interrelated personal and social leadership as these two forms enable each other's development.*

I study transition-oriented leadership in the destabilization of regimes phase of sustainability transitions, wherein incumbent actors start acknowledging increasing pressures on the regime and consequently start doubting the viability of the regime, providing incentive to engage in regime change (Raven, 2006; Lodder et al., 2017). A new framework that has been developed in this phase, and which implicitly incorporates leadership, is the Transition Space concept (Beers & Loorbach, 2020). The Transition Space project has been based on this framework. In transition space, coalitions of actors are formed to enable institutional work, experimentation is based on developing new institutional structures strengthening innovative practices and the role of vision changes to envisioning consequences of a transition for each actor individually.

Following literature on sustainability transitions in general and more specifically on destabilization of regimes, I synthesized six types of actions an actor can undertake in this phase of sustainability transitions to which transition-oriented leadership can contribute: collaborate with multiple other actors in sustainability projects; (re)formulate and align visions, both individual and collective; adopt innovations; create and/or transform networks; engage in institutional work; motivate an actor's organisation to be on board with change.

I then synthesized four approaches to leadership (leadership theories) that are most promising to stimulate undertaking these six types of actions: Personal leadership; Collaborative leadership; Transformational leadership; and Institutional leadership. The latter three are specific forms of social leadership. These approaches to leadership and the types of actions have been synthesized into the transition-oriented leadership framework (Figure 1).

Results and discussion: Through analysis of the network meetings and the interviews, I can make a number of observations. I make observations instead of drawing hard conclusions because of the lack of a(n) (partial) assessment by a second coder necessary to minimize (first coder) subjectivity and to calculate an inter-rater reliability.

I discovered that through transition-oriented leadership, as a form of collaborative agency, an actor is able to stimulate the creation of a shared vision in transition projects. It can be used to identify and create new coalitions and it can contribute in helping actors discover what institutional work is required in the transition and how to implement it. In addition, transition-

oriented leadership is a way to foster collaboration between different organisations in transition-oriented projects.
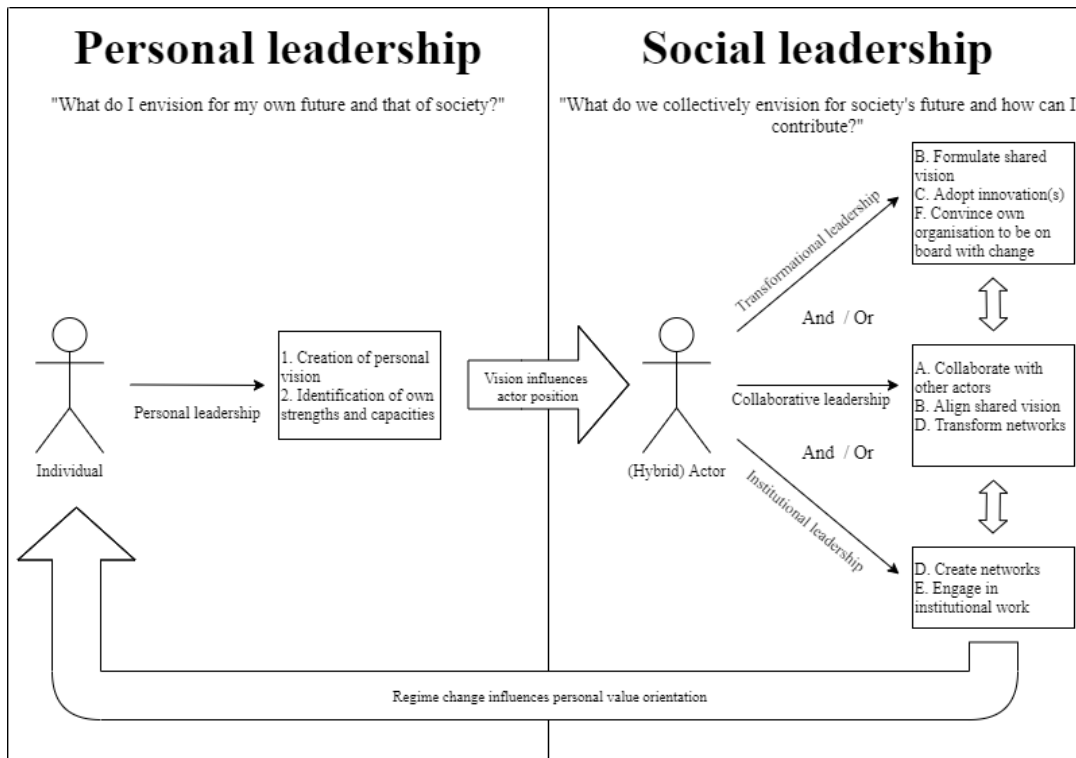

Figure 1: The framework for transition-oriented leadership

Based on the results, I validated the transition-oriented leadership framework of Figure 1. Actors exhibited collaborative leadership while trying to collaborate with other actors, while transforming current networks and while aligning visions of other actors into a single shared vision. Actors exhibited transformational leadership while formulating a shared vision, while motivating others to adopt certain innovations and while providing feedback from the project to their organisations. Actors exhibited institutional leadership while engaging in institutional work and as part of that while creating new coalitions, or networks. Before the interviewed actors joined the project, they exhibited personal leadership and created a personal vision, which led them to join the project and which showed them their strengths and capacities and as such which approaches to (social) leadership they are more at ease with to exhibit.

The transition-oriented leadership has been validated and is in line with previous research on leadership in sustainability transitions (Grin et al., 2018). I move past Grin et al. (2018) by showing the importance of facilitators in exhibiting collaborative leadership in transition-oriented projects; by showing the importance of institutional leadership in engaging in institutional work; and by showing the importance of personal leadership in exhibiting social leadership (through transformational, collaborative and/or institutional leadership).

Finally, I have made three observations on how leadership is stimulated in transition-oriented projects:

Observation 1:   Certain context circumstances, being avoidance of discussion on management and identification of obstacles to overcome, may contribute to stimulating project participants to exhibit leadership.

Observation 2: The strengths, capacities and position of an actor influence which approaches to leadership an actor exhibits in a transition-oriented project.

Observation 3: Facilitators and guiding questions have a vital role in stimulating leadership in transition-oriented projects.

Conclusions: I developed a new form of collaborative agency, called transition-oriented leadership, through which actors in transition projects create shared visions, develop new networks/coalitions, engage in institutional work and collaborate with other actors. I hypothesize this approach to leadership can be stimulated through avoidance of discussion on management, stimulation of discussion on obstacles, the selection of the right actors with strengths, capacities and positions allowing them to exhibit certain approaches to leadership and by making active use of facilitators and guiding questions.

Acknowledgements

First and foremost, I want to thank dr. ir. Myrthe Maurice-van Eijndhoven and dr. PJ Beers for their guidance in creating this thesis. Through their experience, feedback, knowledge and resources I have managed to elevate this work far beyond my own expectations. Next, I want to thank dr. ir. Frank Veraart. His guidance and feedback has kept me on the right path towards creating a thesis worthy of TU/e standards. I also want to thank dr. Johanna Höffken for her feedback on my first draft, which has allowed me to improve the work even further.

Within the Transition Space project, there are a number of people who have helped me in some capacity, who I would like to thank: Marloes Vermeer for our discussions on leadership; The graduate students of HAS for their work in organizing and recording the network meetings; All project partners and guests for their participation in the network meetings and leadership they (subconsciously) exhibited; The interviewees for freeing up time to allow me to interview them.

And finally I want to thank Verena, who has had to put up with me in times of lockdown, curfew and obsessive thesis writing. You have been amazing in preventing me from going too far in my obsession.

Table of Contents

Leadership in sustainability transitions

Figures and tables

1. Introduction

In the past decades, much effort has been made to make societal systems more sustainable. One method to do this is through facilitating sustainability transitions. These transitions are defined as radical change of a societal system into a more sustainable system, dealing with a number of sustainability problems these systems have and which influence society (Grin et al., 2010). In order to stimulate transitions and through this improve sustainability, transitions should be understood. In the past decades, the field of (sustainability) transition studies has studied transitions and has gained an understanding of them.

There are, however, a number of knowledge gaps in contemporary transition studies. Much research has been done on early stages of transitions, in which the focus lies on experimentation and the development of (radical) innovations and building networks around them to create innovative systems. Little research has been done on later phases of transitions, such as the destabilization of regimes. In this phase, the existing system have to deal with crises that challenge whether a system is sustainable, whereas the innovative systems increase institutionalization. Even less research has been done on the role of leadership in transitions. In this thesis, I contribute to closing these gaps by studying the role of leadership in the destabilization phase of transitions.

Starting with the latter, leadership only recently has started getting attention in transition science, although it implicitly has been part of transition studies for a much longer time now. Leadership is a broad concept comprising of many definitions, applications and theories, yet has been discussed only little in transition studies (see the special issue of *Sustainability* called "Leading Sustainability Transitions" for the contemporary discussion of leadership in sustainability transitions). In this work, I discuss leadership as being a process in which actors are influenced to achieve a common goal (See Section 3). Leadership entails setting a common goal, or vision.

This notion of vision creation is not new in transition studies. As an example, the transition management framework of Loorbach (2007) comprises the step agenda-building. In this step, a strategy is developed towards shared visions, which implicitly suggests the need for leadership. Explicitly, leadership however only recently has seen discussion in transition literature. For example, Grin et al. (2018) studied the role of certain approaches to leadership in transitions. They discussed the role of transformative (transformational) and relational (collaborative) leadership in relation to transitions.

The scientific literature available on leadership focus mostly on leadership within one organization (Northouse, 2019), and only little on leadership between organisations working together (e.g. Kramer et al., 2019; Sullivan et al., 2012; Craps et al., 2019). As sustainability transitions occur in collaborations between various organisations (See Section 3.2), not all literature on leadership is suitable for sustainability transitions. This means that different approaches to leadership are more promising in stimulating sustainability transitions than others. Based on existing literature on leadership in transitions and literature on leadership in other situations, in this thesis I synthesize four approaches to leadership that are promising to stimulate transition-oriented projects.

The former point, being that little transition-oriented research has been on the destabilization of regimes phase of transitions requires some further elaboration too. As Markard et al. (2012)

show, much of transitions literature has been on the early exploration stages, for example think of frameworks like the Strategic Niche Management, Multi-Level Perspective, Transition Management and Technological Innovation Systems.

Recently, some transitions research has started to diverge from this exploration phase (Köhler et al., 2019). One of these works is the conference paper by Beers & Loorbach (2020). They have been doing research on the transition space, which is a new concept embedded in the destabilization of regimes phase in sustainability transitions. They build on Transition Management, but move away from the development of innovations and experimentation in favour of the next phase of sustainability transitions in which niches often become increasingly institutionalized and regimes lose some stability. In such situations, they argue a Transition Space opens up, allowing both incumbent and niche actors to come together and share ideas and resources. These interactions may then lead to the development of new innovative practices and/or to the engagement in institutional work to make existing structures more advantageous for new practices. I set the destabilization phase of transitions as boundary in which I study leadership, as different transition phases deal with different challenges to overcome in which different approaches to leadership may be required (Section 3.2).

The combination of these two gaps in transition science literature forms the foundation of this thesis. Based on these gaps, I have chosen to study how leadership can help in the destabilization of regimes phase of transitions to speed up said transitions.

This study has been conducted as both a master's thesis at Eindhoven University of Technology and as one of the studies within the Transition Space project at HAS University of Applied Sciences (further referred to as HAS). The latter is part of the 'New Business Models for Agriculture and Food Transition' research group of Beers. In the project, various incumbent actors from the agrifood sector have come together to discover what they can do in terms of institutional work to facilitate the sustainability transition.

During the early stages of this project, the apparent importance of the role of leadership became evident, which eventually became the reason this study was conducted. A number of research questions regarding leadership in sustainability transitions have come up that require inquiry. The project itself has been used as a case study, in which critical points of the project were assessed on leadership that has been exhibited.

Based on this all, the research question can be defined as:

> *What is the role of promising approaches to leadership in transition-oriented projects in the destabilization of regimes phase of sustainability transitions and how can this leadership be stimulated?*

With sub-questions:
1) What types of actions in the 'destabilization of regimes' phase of sustainability transitions can be stimulated through leadership?
2) What approaches to leadership are most promising to stimulate these activities?
3) How do these promising approaches to leadership take place in transition-oriented projects?
4) How can the use of these promising approaches to leadership be stimulated in transition-oriented projects?

The aim of this thesis is to gain more insight in the role of leadership in stimulating transition-oriented projects. Answering the research question and sub-questions contributes to transition studies in multiple ways. First of all, it provides new insights in how leadership can assist in facilitating sustainability transitions. It provides new insights in the destabilization of regimes and how leadership factors into this. Second, through answering the first two sub-questions, a new tool is developed that can assist in recognizing leadership in transition projects, in the form of a transition-oriented leadership framework. Third, through a new methodology, the leadership that is exhibited in such projects can be assessed. And fourth, a number of observations are made regarding how leadership is stimulated in transition-oriented projects.

This thesis furthermore has served as the inspiration for the conference paper called "The role of leadership in sustainability transitions – A case study of leadership in the Dutch agrifood system" (Appendix E). This paper is discussed at the International Sustainability Transitions Conference (IST) 2021.

Approach and setup
In the next section, I discuss the methods used to answer the research question and sub-questions. Then in Section 3, by means of a literature study discussing secondary sources, the first two sub-questions are answered. In Section 4, data collected in the case study of the Transition Space project is analysed and reported on. These results have been interpreted in Section 5, along with a discussion on what these interpretations mean for transition studies. In Section 6 conclusions are provided.
The results are twofold. First, a conceptual transition-oriented leadership framework based on both primary and secondary sources that actors in agrifood systems can use to improve processes within their sustainability transition initiatives has been developed. And second, a number of observations regarding how leadership is exhibited and how leadership can be stimulated are made.

2. Methods

In this section, first the general research design is elaborated on a little more, after which the case study that has been used as data source has been described. This part is followed by elaborations on data collection and data analyses, with a final subsection dealing with validity and reliability.

2.1 General research design

To funnel the choice for a specific methodology from broad to a more specified description, the first point to elaborate upon is the type of research. Following Creswell (2014), the most relevant type of research to answer the questions of this thesis is postpositivism. In postpositivist research, causes are sought that explain certain outcomes. Similar to the search of how leadership affects transitions. The answers to such questions are developed by observing and measuring reality in an as objective manner as possible. Postpositivism sees laws and theories that govern the world, and tests or verifies them.

The most useful way to do this, in general is quantitative research. However, as leadership entails the interactions between individuals and these interactions only are interesting in their natural settings, I opted for qualitative research. A few key features of qualitative research design are:

1) A natural setting is required to analyse and eventually understand the complex social interactions that occur.
2) A variety of data sources are used to get a full picture of what is happening.
3) Data analysis occurs in increasingly more abstract data. From the bottom up, data is reworked into more and more abstract data, until eventually themes emerge. The data analysis process is iterative as well, moving back and forth between specific and more abstract data, but also between methodology, data collection, analysis and interpretation.
4) The author itself is a key instrument interpreting data, while being subject to bias. Their own identity results in specific ways of interpretation (Bourdieu, 1979), resulting in the actor itself being part of the results.

The specific qualitative research design is a case study, described in Creswell (2014, p.43) as a "design of inquiry in which the researcher develops an in-depth analysis of a case, often a program, event, activity, process, or one or more individuals. Cases are bounded by time and activity, and researchers collect detailed information using a variety of data collection procedures over a sustained period of time." In order to assess whether the approaches to leadership as provided in the transition-oriented leadership framework indeed describe the leadership shown in sustainability transition projects, a case study is a highly effective research design to use.

In this thesis, I use the Transition Space project of the 'New business models for agriculture and food transition' research group at HAS University of Applied Sciences as a case study. I chose this project as it is directed at facilitating a sustainability transition and I have had full access to all documents and files of the project, as the project leaders have acted as supervisors for this thesis as well.

2.2 Case study background: Transition Space project

This section serves as a description of what the project is, how it evolved, how it is structured and what the goals are of the Transition Space project, which has been running for a number of years now. I have chosen this project as a case study to analyse in order to validate the transition-oriented leadership framework and to answer sub-questions 3 and 4, being 'how the promising approaches to leadership are shown in transition-oriented projects' and 'how the use of promising approaches to leadership can be stimulated in transition-oriented projects.' As is discussed in Section 2.3, I only analyse the network meetings of the project and conduct interviews with a number of the project partners. For completeness and to position these data sources within the project, a short summary of the entire project is provided here.

The first stage of the project started when one of the eventual project partners discussed a sustainability issue their organisation encountered with two people of HAS. The result of this discussion was that the issue could be dealt with by using methods used in transition management. This led to the first, smaller, project in which three partners utilized their networks to form a first consortium with a number of organisations within the Dutch agrifood system with the intention to conduct a foresight exercise. Through multiple network meetings in which each project partner invited a number of actors from their own networks, this resulted in 3 future scenarios.

Meanwhile, two other developments occurred that led to the decision to push the project to a second stage. Firstly, at HAS the research group of project leader Beers ended. He had to determine what a follow up research group would focus on. An expectation from HAS was to seek more connection with the agrifood sector. Second, at the Dutch Research Institute For Transitions, in the research group Beers is part of, the concept of Transition Space was being developed. These three developments led to the idea to follow up on the project and to create the Transition Space project.

The next step was negotiation, in which amongst other things various potential partners stated who they want to work with in the consortium. Eventually, a consortium was formed in which the following organisations participated: HAS university of applied sciences; Waarde van het Land; ZLTO (Dutch southern agriculture and horticulture interest group); NAJK (Dutch agricultural young farmers organisation); LTO Noord (Dutch northern agriculture and horticulture interest group); Achmea; Flynth; Rabobank; Natuur en Milieufederatie Noord-Holland. The new consortium had a plethora of goals, with the main goal being the creation of action perspective and the speeding up of the transition.

The consortium successfully submitted a grant proposal for a two-year project. The Transition Space project can be subdivided roughly into two parts. In the first year, the HAS researchers started with the design of the project and started working on creating an understanding of the transition space concept. Eventually, it was established to hold a set of network meetings with the project partners, innovative farmers and other actor in the Dutch agrifood system in which opportunities and obstacles were to be identified that would be characteristic for the transition space. Due to the COVID-19 pandemic, these network meetings were forced to be held online. This was a success, and eventually 4 network meetings revolving around 7 innovative farmers

were held in the first year. The results of these meetings were used to create an action agenda, which later was further refined into a number of activities that were centred in four action lines. These action lines were the basis of the network meetings of the second year. In this year, the main focus shifted towards making use of the previously developed transition space. For the action lines, different project partners started to take more lead. Based on these action lines, more specific research questions were formulated. These eventually were answered by a joint effort of the work of graduation students of HAS and a new series of 4 network meetings in which more institutional changes were discussed in their potential for action perspective. These different action lines resulted in more concrete action perspective for the partners in the consortium. This is where the consortium was at, at the moment of writing of this thesis.

To provide a little more detail to the network meetings, as they have been important moments in the Transition Space project and important data sources in my study, some more details will be provided on them. For the first year, as mentioned, the project partners met online with innovative farmers from the Dutch agrifood system in a set of 4 network meetings.

These meetings were guided twofold. First, through a combination of graduation students of HAS and two HAS researchers, a number of guiding questions were formulated. Second, the researchers and people from Waarde van het Land took on roles as facilitators, steering the discussions. In sessions of about 3 hours, the participants would split up in breakout rooms. The innovative farmer would elaborate on their business, after which discussion between the participants was stimulated, based on how the innovative farmer would fit into one of the future scenarios that were created earlier on in the project. The end goal of the discussion was to identify opportunities and obstacles the innovative actor would face moving towards this future scenario, but also to determine what the individual participants could do to help in this.

The network meetings of the second year were constructed in a similar fashion. Divided over the action lines, 4 network meetings were organised, again with guiding questions and facilitators. The goals of these network meetings all revolved around the use of several institutional changes of the system expected to speed up the transition. Several questions were discussed in breakout rooms based on specific institutional changes with the goal to formulate a number of action agendas with specific actions the participants can undertake to speed up the transition.

2.3 Data collection

With regard to data collection within the Transition Space project, the most important question was which data to use both for the literature study and the analysis of the case study.

2.3.1 Literature study

Using secondary sources, the first two sub-questions are answered. These are 'What types of actions in the 'destabilization of regimes' phase of sustainability transitions can be stimulated through leadership?' and 'what approaches to leadership are most effective to stimulate these activities?' This is done by using literature on both transitions and leadership found through the use of specific search terms and the snowballing effect, and some literature provided by HAS. Eventually, after the literature provided me with a sufficient impression of both the current state of transition literature and leadership literature, I synthesized the results of the literature study into a new conceptual framework on transition-oriented leadership.

2.3.2 Case study

Due to the richness in data from the sheer amount of time the Transition Space project has been running in combination with a multiplicity of different actors being involved in the project, hard choices have had to be made on which data to include and which to exclude.

This choice came to the 8 network meetings detailed in Section 2.2, as they are found to be the richest in data. Furthermore, due to the network meetings being fully online, the entirety of the network meetings has been recorded, making them readily available. The network meetings were fully transcribed using artificial intelligence and then corrected by the first analyst. Final analysis took only place on the basis of the full transcripts. After analysis of the first five meetings, of which three took place in the first year and two in the second year, saturation of the codebook was established. The final three meetings were not analysed in detail, but only checked for new structurally different codes, which were not identified. In conclusion, for the first five network meetings, the data used were complete transcripts and for the final three network meetings, the data used were video-files.

While analysing the network meetings, it became evident that several aspects of the transition-oriented leadership framework were not represented in the data, due to the nature of these aspects and the way network meetings work. Specifically participants did not engage in personal leadership (See Section 3.3.1 for information about personal leadership) during the network meetings and the participants did not use leadership to convince their own organisation to be on board with transition-oriented change (See Section 3.2.2). This is because both of these aspects of the framework usually occur either prior to these network meetings (personal leadership) or after the meetings (convincing one's own organisation).

In order to gain some insight in these two elements of the framework that were not covered by the network meetings, and to validate the data analysis of the network meetings, three interviews have been conducted. In consultation with the project leaders, three project partners have been chosen to be interviewed that best represent the heterogeneity of the project partners. They also have been chosen because of their specific inputs and influence in the project over time.

For the interviews, an interview protocol was used in order to ensure all project partners were asked the same questions. The interviews then were recorded by means of the recording option of Microsoft Teams. The recordings were transcribed and analysed using the codebook (see Section 2.4 for an explanation on how the codebook is constructed).

The interviews were conducted as semi-structured interviews (Adams, 2015), in which I used open-ended questions as a way to guide the interview. Four sets of questions were prepared before the interviews, which I asked about not necessarily in a particular order and I not necessarily asked all questions if the previous answers in the interview already answered the question or it became clear throughout the interview the question would not apply to the interviewee. The four sets of questions were designed to provide insight into the aspects of the transition-oriented leadership framework the network meetings did not go into and to ask the project partners about the leadership they exhibited in the project. Specifically, the four question sets revolved around the following four topics, with the full list of questions in appendix A:

1) Actor positioning
2) Personal leadership
3) Leadership in the Transition Space project
4) Feedback between project and own organisation

2.4 Data analysis

After data collection, I analysed the various network meetings and interviews on what leadership has been exhibited by whom in the Transition Space project. The main method used for analysis is coding. This process has been iterative. Data collection through interviews, transcription of all data, analysis of the transcripts and writing down the findings all happened concurrently. This method of analysis has resulted in the inclusion of the interviews, but especially has resulted in the codebook becoming ever more specific. Every time a new insight and subsequent code was gained in analysis, I went back to earlier transcripts to match the new code with earlier coding efforts.

Furthermore, to reiterate, while it has been observed that leadership is exhibited at every part of the project, the choice has been made to only focus on the network meetings and interviews to analyse as these are the richest in data. As denoted in Creswell (2014), the typical method of analysis for case study research is to first provide a description of the case study (Section 2.2) and to then look for themes through analysis.

The next step to discuss relates to the codebook and the coding process. Each transcript has been coded with codes detailed in a codebook, which has been created using predetermined and emerging coding. The basis of the codebook is based on the transition-oriented leadership framework, and has been constructed prior to the analysis. Then, during analysis, the codebook was extended. In a second layer, specific actions and dialogue were denoted that specify whether one of the main codes occurred. Furthermore, some additional codes were added that did not fit with the predetermined codes, but still were important in showing what leadership was exhibited. All of the main codes are shown in Table 1, whereas the second layer of coding is denoted in Appendix B.

To provide some explanation to Table 1: the P codes illustrate the various elements of personal leadership, the C codes collaborative leadership, the T codes transformational leadership, and the I codes institutional leadership. These codes are all based on the information from Section 3.3 in their corresponding subsections. The 'other' codes have been subdivided in three categories. These codes do not correspond to exhibited leadership, but they are related to leadership. In Sections 4 & 5, the relation between these 'other' codes and leadership will be explored in more detail. The X code details obstacles, the Y codes detail different roles for organisations, and the Z codes detail how personal leadership is affected by and affects leadership exhibited in transition projects.

Predetermined codes have been used to ensure the analysis is about leadership and whether the framework captures what leadership is exhibited. Emerging codes have been synthesized from the iterative analysis process and complement the predetermined codes. A literary base for these predetermined codes is provided in Section 3.3.

Due to interlinkage between approaches to leadership (See Section 3.4), leadership that can be coded multiple ways, has been coded accordingly by placing all applicable codes.

Code label	Code description
Personal leadership	
P1	An actor formulates a personal vision for the future
P2	An actor questions how a future vision would factor in the life of the actor
P3	An actor discovers or capitalizes on their own strengths and capacities
P4	An actor vocalizes their personal vision
Collaborative leadership	
C1	An actor brings other actors together
C2	An actor helps negotiate the decision-making process
C3	An actor handles conflict between actors in the group
C4	An actor ensures shared and equitable decision-making, and deals with issues of trust and legitimacy
C5	An actor ensures leadership and decision-making are transparent towards all actors
C6	An actor steers the group towards the creation of a shared vision
C7	An actor ensures power is shared between all actors
C8	An actor aligns different visions into a shared vision
Transformational leadership	
T1	An actor creates a future vision for the system
T2	An actor builds trust between actors, by making their position clear and by standing by them
T3	An actor stimulates other actors to come up with creative solutions towards a shared vision
T4	An actor motivates other actors to get along with their own vision
T5	An actor inspires other actors to be more open to personal sacrifice in pursuing a shared vision
T6	An actor creates a context for knowledge gathering
Institutional leadership	
I1	An actor creates legitimacy by extending networks
I2	The actor influences third parties to engage in institutional change
I3	The actor attempts to change regulative institutions
I4	The actor attempts to change normative institutions
I5	The actor attempts to change cognitive institutions
I6	The actor attempts to change economic institutions
I7	An actor creates internal consistency and support base for institutional change
Other	
X1	An actor presents an obstacle to overcome
Y1	An actor discusses a new role for the own organisation in a new shared vision
Y2	An actor discusses a new role for another organisation in a new shared vision
Z1	A new insight from the transition project influences the personal leadership of an actor
Z2	An actor uses their personal leadership to exhibit different leadership in sustainability transition projects
Z3	An actor their personal vision stimulated them to be involved in a sustainability transition project

Table 1: Codebook for transition-oriented leadership

An important step was anonymization of the data, which has to be done due to Dutch privacy laws the project leaders in the Transition Space project adhere to. This has been done in several ways. The different actors involved in the network meetings are denoted through the (type of) organisation they are affiliated to. Second, the only pronouns I use are they and them, in order to avoid using gender specific pronouns, which may be used to trace back statements. Third, I combine multiple break out rooms/interviews into single narratives, to make it more difficult to trace back what was said or done at which point.

2.5 Validity and reliability

I use various validation strategies in this thesis (Creswell, 2014). First, several data sources and perspectives have been used to get the results. Second, initial results were run by participants to check for inaccuracies. The interviews were presented back to the interviewees and through interviews, the interviewees presented their views on how they exhibited leadership in the project. While these reflections are not flawless due to bias of the interviewees themselves, they provide an indication whether the results of this thesis are in the right direction. Third, through the bias section and self-reflection of the author (Section 5.4), validity is increased.

Next, to increase reliability two strategies have been employed as well (Creswell, 2014). First, all transcripts have been checked with the original recordings of both network meetings and interviews, which was necessary as the artificial intelligence was not 100% accurate in transcribing. Second, through the iterative process and going back and forth between network meetings and interviews each time a new insight was gained, drift has been avoided.

3. Literature study

As other authors, like Grin et al. (2018), already have discussed, dealing with the underlying wicked problems of transitions requires leadership. About the relation between transitions and leadership, however, less is known. Through this literature study, I develop a conceptual framework for leadership in the context of sustainability transitions. In Section 3.1, a definition of leadership is discussed and how this definition relates to several concepts in transition studies, like agency. Section 3.2 discusses activities in transition studies that could benefit from effective leadership. The focus primarily is on the destabilization of regimes and the Dutch agrifood system. These activities are reworked into types of actions for sustainability transitions that could benefit from leadership. Section 3.3 then focuses again on leadership literature to find approaches to leadership that have most potential to contribute to performing these types of action. Finally, in Section 3.4, types of action and approaches to leadership are combined to create a conceptual transition-oriented leadership framework.

3.1 Leadership

In this section, I create a definition for transition-oriented leadership. First, a broad definition of leadership in social interactions is provided. Second, the leadership for sustainability transitions definition is embedded in transition studies by relating it to existing concepts in the field. Third, as leadership has been studied extensively, leadership is narrowed down to a definition of leadership for sustainability transitions. Finally, a definition of transition-oriented leadership is provided.

3.1.1   A definition of social leadership

In the past 100 years many studies have been conducted on leadership, through which many definitions on what leadership exactly is have been developed. In their reviews on leadership literature, Stogdill (1974), Rost (1991) and Northouse (2019) exhibited the many variations of leadership definitions that have been developed in these 100 years. One such definitions discusses what I call *Social Leadership*, being leadership that occurs in social interactions. I chose this definition as a base definition of leadership on which I build due to the notion that transitions occur in social interactions as well (Geels & Schot, 2010). Northouse (2019, p.5) came up with a definition for this social leadership:

> *"Leadership is a process through which an individual influences a group of individuals to achieve a common goal."*

The four elements in this definition are
1) Leadership is a process. This excludes the idea that leadership is a trait inherent to some individuals, meaning that everyone is able to lead.
2) Leadership involves influence. This highlights the role of communication, both verbal and non-verbal, in leadership through which a leader influences someone else.
3) Leadership occurs in a social setting. It takes place in the context of groups. This means that the definition of Northouse excludes personal leadership.
4) Leadership involves common goals or visions. Both the leader and the people the leader influences have a common purpose they work towards.

Summerfield (2014) came up with a similar definition of leadership, based on three main elements in leadership: A democratic component, meaning the leader works to achieve a shared vision that is jointly conceived or agreed; A collegial component, meaning the leader influences rather than dictates others to do things; And an enhancement component, wherein the result of leadership leads to an improved situation.

Before moving on to an embedding of leadership within transition theory, a few distinctions should be made clear to avoid confusion on what leadership is and what it is not. Leadership differs from management. Management is involved with taking actions and doing this as efficiently as possible. Leadership is involved with determining what actions to take (Covey, 1989). The next distinction is between power and leadership. This is not synonymous of each other, especially in process-based leadership discussed in this thesis. Power may be derived from one's position, but as leadership for sustainability transitions is assumed to be based on emergence (Section 3.1.3) and is process-based (first element of the Northouse definition of social leadership), power occurs in the relationships between leader and follower or leaders among one another, it does not explicitly has to be a characteristic of a leader (Northouse, 2019). The same is true for coercion. While leaders in history sometimes did use coercion to force followers to do their bidding and this can be categorized as leadership, due to the collaborative nature of leadership as it is discussed in this thesis, coercion here is not viewed as an "ideal form" of leadership (Northouse, 2019).

3.1.2 Leadership in transitions literature

As already discussed in the introduction, leadership is related to transitions literature. Two of these relations are the in literature implicit link between leadership and transition management and the relation between leadership and agency.

Starting with transition management, as discussed in detail in Loorbach (2007) and more concise in Proka et al. (2018), transition management is a governance approach that provides a framework to develop transition-based governance strategies. It provides a number of instruments to accomplish this, which can roughly be categorized into 4 activity clusters (Loorbach, 2007). Two of these clusters are especially interesting:

1) Problem structuring, establishment of the transition arena and envisioning. Part of this revolves around the development of a (shared) vision.
2) Developing coalitions and transition agendas. All these activities are supposed to create a course of action.

In these two clusters, parallels can be observed with leadership. Both leadership (Section 3.1.1) and transition management stimulate the creation of common visions and both transition management and leadership (Section 3.3.2) seek actions that help in moving towards these visions. Proka et al. (2018) recognize this link in that they attempted to use transition management as a methodology to facilitate the development of leadership.

The second relation is the link with agency. Leadership is closely related to the wider concept of agency. In literature on sustainability transitions, agency usually is referred to 'as actor behaviour with regard to change' (Fischer & Newig, 2016). Loorbach (2007) defined agency as the actions of agents. Yet, an important notion is that agency is embedded and temporal in

its capacity to instigate change (Kok et al., 2021). This embeddedness is referred to as "structures", with a structure being formally defined as the rules and resources that actors use (Loorbach, 2007). Institutions are an example of structures. Structures form the conditions in which agency can be enacted. As such, agency determines what structures look like, while structures determine how and to what extend agency can be expressed (Koistinen, 2019; Giddens, 1984).

In relation to agency, Raelin (2016) conceptualizes leadership as a form of collaborative agency, in which he defines collaborative agency as actors coming together and interacting to coordinate their activities, potentially changing their own activities. Raelin defines leadership as a practice anyone can participate in, making it both emergent and process-based. In this notion, leadership emerges as groups decide what to do, and how. Individual actors in collaborative settings (re)construct their positions and issues, and as such co-produce the structure and thus the system they operate in. This is a continuous process, as disturbances from or changes to the broader environment, being landscape, regime and/or niche, constantly force actors to adapt. Leadership through this notion focuses on building towards visions and maintaining them.

A number of studies have been conducted on leadership as a process of (collaborative) agency. While not focusing on sustainability transitions, Kramer et al. (2019) show that actors coming together with a common goal employ various leadership theories to ensure the success of varying activities in the collaboration. These leadership theories illustrate different ways in which an individual can exhibit leadership. They focus on different actions an individual can undertake in creating and moving towards a vision. In this thesis, I refer to leadership theories as *approaches to leadership*. Kramer et al. (2019) also show that these approaches to leadership do not all occur simultaneously, but that throughout the duration of the collaboration different approaches get the upper hand.

Sullivan et al. (2012) recognize the link between leadership and a concept called situated agency, with the latter being defined as the freedom of agents to act influenced by a certain structured context, towards either individual or societal goals. Situated agency differs per actor as the structured context differs per actor, and so does the preferred approach to leadership. A link was identified between an actor's vision and preferred approach to leadership an actor uses. The underlying notion here is that different actors have different visions, pursue different actions and have a different context in which they operate, and as such prefer to exhibit different leadership approaches. This means that each actor behaves differently in contexts of social leadership, wherein the origin of these differences lies in differences in personal vision (See Sections 3.3 and 3.4 for more elaboration on the link between personal vision and social leadership).

Craps et al. (2019) provide more insight into the different leadership approaches that may be employed in settings of collaborative agency, albeit not in sustainability transitions as well. They provide a distinction in leadership literature between traits and relations being the main element from which leadership emerges, and argue for a relational approach in processes of collaborative agency, highlighting the importance of process-based leadership. One specific observed approach to leadership was transformational leadership, which is explained in Section 3.3.2.2.

Grin et al. (2018) found similar approaches to leadership in sustainability transitions. They as well argue for relational (based on collaborative leadership) and transformational (called transformative in their paper) leadership to be important. Furthermore, they also create a link between the context in which the actors are embedded and leadership. Through a focus on institutional work and system-building, they recognize the ability of leadership in processes of collaborative agency to change structures.

3.1.3 Connecting leadership to sustainability transitions

As Section 3.1.1 shows, it is difficult to capture every aspect of leadership into a single definition. Therefore, in order to develop a definition of leadership tailored to sustainability transitions, different points will have to be considered on the aspects of leadership literature that fit best in the context of leadership for sustainability transitions. This section serves that purpose. This does not mean that other aspects of leadership do not influence sustainability transitions. It just means that the aspects captured in the definition are more influential in sustainability transitions.

In his book, Northouse (2019) exclusively focused on *social leadership*, wherein leadership occurs in social settings. However, this is not necessarily true for all leadership literature. Covey (1989) discussed the idea of *personal leadership*, which involves approaches to lead one's own life. In practice, this would for instance occur through defining life goals or a vision for life and assessing what the individual can do to reach these goals/visions.

While sustainability transitions necessarily involve multiple actors and as such social leadership would be important (Geels & Schot, 2010), researchers in the transition space project and to the project connected leadership experts discovered early in the project the importance of personal leadership in these transitions. As such, the choice was made to focus on both social and personal leadership.

Based on this first point, another element of the definition of Northouse (2019) should be revisited. Within social leadership, leadership primarily is process-based rather than trait-based, as discussed in Section 3.1.1. However, as Covey (1989) discusses in his work on personal leadership, an individual may develop certain strengths and capacities towards reaching their personal vision (See Section 3.3.1). When translated to social leadership, these strengths and capacities can act as traits that enable these actors to excel in exhibiting social leadership. While it is important to understand the role of these traits in how actors determine how they exhibit social leadership, going into great detail in what these traits exactly are is beyond the scope of this thesis.

The third point of consideration involves the question of whether leadership is assigned or emerges. Assigned leadership involves leadership based on occupying a specific position. Emergent leadership is leadership that emerges within an individual over time through communication with other actors (Northouse, 2019). While assigned leadership may be of some influence in sustainability transitions, the inter-organizational nature of sustainability transition projects suggests less influence of people in certain positions, while the emergent and uncertain nature of new networks suggests a larger role for emergent leadership.

A fourth point involves a clarification of the relation between visions. In this thesis, a number of definitions regarding *vision* are discussed. A difference exists between a shared vision and a personal vision. The shared vision of sustainability transitions is a sustainable system. How this sustainable system looks is determined through exhibiting social leadership, in group settings. Personal leadership, however, not necessarily has a sustainable system as a vision. Through personal leadership, an individual determines their personal vision, and this vision not necessarily has to be working towards a sustainable system. Furthermore, if an individual has a sustainable system as vision, the individual may have many different reasons to have this vision. As an illustration, a food distributor may shift towards the use of electric trucks to make their company more sustainable, but may do this only because they want the competitive advantage to remain profitable in order to feed their family. In this example they have created a vision for a sustainable system out of a bigger vision to ensure continuous welfare for their family.

To summarize, leadership in sustainability transitions involves both personal and social leadership, primarily arises through emergence rather than assignment and is about both personal visions and a shared vision. Following these distinctions, a more specific definition of leadership in sustainability transitions may be formulated, in which personal leadership of actors influences social leadership in sustainability transitions projects and vice versa (See Section 3.1.4).

3.1.4 A definition of leadership in sustainability transitions

Building on the above elements of leadership, I reframe leadership as a process of collaborative agency and call it ***transition-oriented leadership***, wherein different approaches to (social) leadership can be exhibited by an actor to use as tools to deal with different challenges that occur in transitions. Furthermore, personal leadership influences the way actors enact social leadership. For the conception of leadership in sustainability transitions, I distil an initial frame for a leadership framework out of these notions. Personal leadership determines both the position of an actor in a sustainability transition and the actions an actor can undertake, thus individual agency. This in turn influences what approaches of social leadership an actor may adopt in processes of collaborative agency to actually realize a sustainability transition. The transition in turn may change structures, changing the individual agency of actors. This may result in them exhibiting personal leadership again.

I synthesize all this in a definition of ***transition-oriented leadership*** based on collaborative agency:

> *Leadership in sustainability transitions entails two interrelating forms of leadership. Individual actors exhibit personal leadership to develop a personal vision and a broad range of actions they can take towards it based on their strengths. They use this knowledge to exhibit social leadership in settings of collaborative agency to influence oneself and others to develop a shared vision and take action to move towards the shared vision with the intention to improve the current system through changing the structures of the system and adapting to these changes. Transition-oriented leadership entails the interrelated personal and social leadership as these two forms enable each other's development.*

One of the key aspects of this definition is that sustainability transitions themselves emerge from settings of collaborative agency. Social leadership thus focuses on leadership between actors of different organisations.

3.2 Transition activities benefitting from transition-oriented leadership

Based on the broad definition of transition-oriented leadership from the previous section, in this section I identify the activities in transition studies that could benefit most from effective leadership. I use transition literature to synthesize actions that are taken in transitions wherein an actor can take leadership, as a form of agency, to execute the action. In this section, first the positioning of this thesis within sustainability transitions is discussed, as discussing sustainability transitions and their characteristics in general is beyond the scope of this thesis (See Grin et al., 2010; van Mierlo & Beers, 2020; Köhler et al., 2019; Köhler et al., 2018; & Markard et al., 2012 for more elaboration on sustainability transitions in general). Next, a number of specific activities within these confines that are part of facilitating sustainability transitions are discussed. I then reworked these activities into specific actions that can be stimulated through transition-oriented leadership (See Sections 3.3 and 3.4).

3.2.1 Understanding transitions

Sustainability transitions can be understood in multiple ways. One of the more dominant ways of doing this is through differences in interplay between three different levels of structuration of a (sociotechnical) system using the multilevel perspective framework (See Rip & Kemp, 1998; Geels & Schot, 2007 for more elaboration on the multilevel perspective): niche-innovations (niche), socio-technical regimes (regime) and socio-technical landscape (landscape). To provide a short explanation for each: The regime in its basic principle refers to the dominant technology and the institutions and infrastructures surrounding it. It may be described through the interactions between the market, industry, policy, technology, science and culture in a system. The niche is the space where radical novelties emerge and which acts as a shield for innovations to grow, protected from regime influences. The landscape is the parts of society that cannot directly be influenced by actors in both the niche and regime (Geels & Schot, 2007).

Different interplays can result in different transition pathways (See Geels et al., 2016). This is just one differentiation of sustainability transitions. Another differentiation is based on the work of Rotmans et al. (2001) and defines a number of different transition phases (Binder et al., 2017; Kanger & Schot, 2016; Kivimaa et al., 2019). These phases, highly simplified, follow an X-curve (See Lodder et al., 2017), see Figure 2.

1) The first phase is pre-development and *exploration*. Experimentation takes place, but the status quo does not visibly change. There is an eagerness to discover what is possible, but there also is a reluctance to change. New niches are no threat to the regime. Simultaneously, the existing system primarily innovates for *optimisation* (Lodder et al., 2017).

2) In the second phase, take off and *acceleration* are the main dynamics. Niche development moves away from experimentation towards developing structures around them. Dominant systems deal with crises that challenge whether the system is sustainable, they destabilize (Lodder et al., 2017). In these processes of *destabilization*,

incumbent actors start acknowledging increasing pressures on the regime and consequently start doubting the viability of the regime (Raven, 2006). This is followed by efforts to change the regime through diversification and/or exploration of new options. As such, incumbent actors actively may try to engage in regime change to match the regime with the external pressures destabilizing it (Turnheim & Geels, 2012). The logic of incumbents in the previous discourse no longer holds up. Furthermore, policymakers can enact several functions to stimulate destabilization (Bosman et al., 2018).

3) The third phase is about *chaos* and *emergence*. Dominant structures break down. New structures get more momentum, but resistance towards change increases (Lodder et al., 2017).

4) The fourth phase is of *institutionalisation* and *breakdown*. Change is irreversible. New structures arise and new power dynamics take hold. Old structures break down further, they start to disappear (Lodder et al., 2017).

5) The final phase is *stabilization*. The regime has successfully changed. A new equilibrium is reached and benefits from economies of scale are reaped. The old system is *phased out*. Losses are accepted by the old system (Lodder et al., 2017).
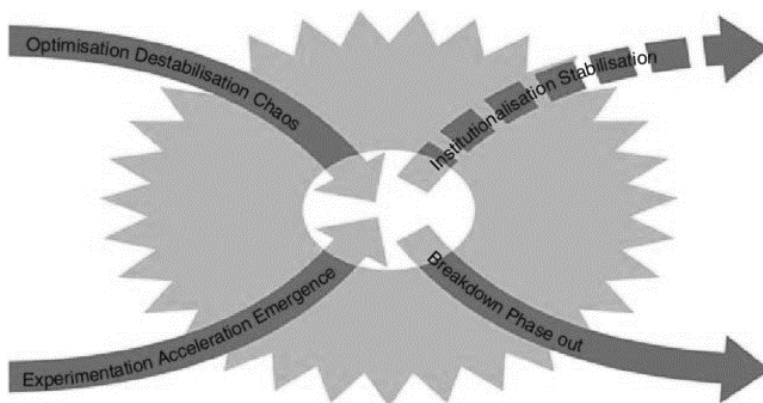
Figure 2: The X-curve of a transition, in Johansen et al. (2018)

As one of the sectors in transition, the Dutch agrifood system is moving towards the acceleration and destabilization phase. One of the projects within the sector that is working in this phase is the Transition Space project of HAS (Section 2.2), wherein a number of incumbent actors have come together to work towards actions of destabilization of the current system and acceleration of a new system.

Beers and Loorbach (2020) created a new framework for sustainability transitions in the destabilization of regimes phase. They based their work on Transition Management. A *transition space* is defined as a context in which various actors, both niche and regime, engage with one another and recognize each other's legitimacy as potential collaboration partner. Such a space opens up, they argue, when existing regimes start failing, but a new regime not yet has solidified. This may happen when actors share concerns about the sustainability of the regime. In this space, the niche-regime dichotomy from the multi-level perspective no longer is present. Actors at both levels of structuration work together to change the regime. Niche actors may provide radical innovations and regime actors may provide incumbent power to influence the system.

Beers & Loorbach hypothesize that four different signs may indicate a transition space opening up: "incumbent actors actively voice sustainability concerns and the need for sustainability transitions; Innovative practices are embedded in new business models that enjoy growing niche markets; A public discussion exists about whether or not a sustainability transition is necessary; Various transition pathways are becoming rather well-known among those in favour of sustainability transition" (Beers & Loorbach, 2020, p.5).

In transition space, coalitions of actors are formed to enable institutional work (Fuenfschilling & Truffer, 2014). Experimentation is based on developing new institutional structures that strengthen innovative practices. The role of vision changes to one where the consequences of a transition pathway are envisioned for each actor individually. With the assumption built into this framework that innovative practices already have been developed, the transition space framework thus may help in making sense of the destabilization phase of sustainability transitions.

In conclusion, based on the X-curve of transitions, the work on transition space and its relation to transition management, the link between leadership and transition management (Section 3.1.2) and the way the Transition Space project is set up, I focus on the acceleration/destabilization phase of transitions.

3.2.2 Leadership as form of agency in destabilization

As discussed above, leadership is a form of agency. Furthermore, within the acceleration and destabilization phase of transitions an actor can undertake different actions, and as such show agency in different ways. Through exhibiting transition-oriented leadership an actor can utilize various forms of agency, which can result in different actions being undertaken. In this section, a number of actions in transitions are identified that can benefit from actors exhibiting transition-oriented leadership. These actions apply to the destabilization phase of transitions.

One of the general characteristics of all sustainability transitions is that they occur through interactions of multiple actors. This means that in a sustainability transition, multiple actors with varying backgrounds from varying societal levels come together and bring their own resources, capabilities, beliefs, visions et cetera to the transition effort. They interact to bring about a sustainability transition (van Mierlo & Beers, 2020; Köhler et al., 2018; Köhler et al., 2019). Actors can actively form networks to collectively engage in innovation and transitions (Tittonell et al., 2016). These actors operate across both niche and regime levels, sometimes simultaneously (Ingram, 2015). This relates to the concept of *hybrid actors*, "who are members of an organisation belonging to the regime, but sympathetic with the proposals of the niche, as they perceive them as helpful in their aim to change the regime" (Diaz et al., 2013, p. 69; Darnhofer, 2015; Elzen et al., 2012).

Within the Transition Space project, regime actors from the Dutch agrifood system came together as hybrid actors to try and change the regime to a more sustainable system. They all have different backgrounds and indeed brought their own capabilities, beliefs and visions to the transition effort, creating a unique configuration of actors.

With a multiplicity of actors thus also comes a multiplicity of beliefs. Different actors can disagree on elements of transitions like which innovations to focus on, but also on what the problem actually is. In every transition, there are both winners and losers, which creates friction

(Markard, 2018; Köhler et al., 2019). This is similar in the Dutch agrifood system and in the Transition Space project. While most actors in both the regime and niches agree that the agrifood system is failing, both visions and priorities on what exactly is failing differ greatly among actors, even between different actors within the regime (Béné et al., 2019). Bui et al. (2016) discuss the need for the ***alignment of different visions*** in the eventual realization of change. In conclusion, different actors have different visions for a sustainable system and perceive different actions as necessary to reach these visions.

In order to reach the visions and as such accomplish systemic change, an activity one can undertake is institutional work. As discussed in Runhaar et al. (2020), regimes that are fragmented and conflicting, that are prone to different visions, provide more opportunities for change. In these fragmented regimes, actors draw from different institutional logics and thus engage in more system changing ***institutional work***. Simplified, these institutional logics are rationalities embedded in societal institutions and philosophical strands (for more elaboration on institutional logics, see Fuenfschilling & Truffer, 2014).
An example Runhaar et al. (2020) provide for this concept lies within the Dutch agrifood system. In their work, they analysed a case study of the Dutch dairy system, of which the regime is not homogeneous. A number of dairy producers in the regime employ a 'market logic,' in which they aim at maximizing production per animal, while minimizing costs. This resulted in the animals often being housed indoors. Others employ a more 'sustainability logic,' wherein the animals are allowed to graze more, which according to these actors increases sustainability. These producers are part of the regime, but draw from different institutional logics.

Elzen et al. (2012) proposed a number of activities that can be undertaken in order to change a system, so-called ***anchoring*** activities. Technological anchoring is where technological characteristics of an innovation become more defined, or where new technical systems may be taken up. Network anchoring is where changes occur in the network. These changes might be expansion of the network, intensified contact/exchange between actors, an increase in interdependence, and/or the strengthening of a coalition.
Institutional anchoring is where institutions are created/changed. This refers to three categories of institutions: Cognitive institutions, or how people make sense of themselves and the world. These include beliefs, visions, and views. Normative institutions, or how societal values are translated into normative rules. And finally, economic institutions, which are the rules and arrangements that govern markets and economic activities. Tittonell et al. (2016) build on this by more explicitly denoting the cognitive aspect in a fourth form of anchoring, wherein mind-sets and capabilities are changed. To make the anchoring process durable, it is hypothesized that all forms of anchoring must be aligned (Elzen et al., 2012).

In conclusion, six main types of action an actor can undertake can be identified, with the sixth type of action being mostly an organisational action:
- A. Collaborate with multiple other actors in sustainability transition projects
- B. (Re)formulate and align visions, both individual and as collective
- C. Adopt innovations
- D. Create and/or transform networks
- E. Engage in institutional work
- F. Motivate the rest of the own organisation to be on board with change

These six types of actions form the context in the transition-oriented leadership framework for which leadership, as a form of agency, can be utilized by actors in order to facilitate a transition. As such, they will be used in the framework as intended outcomes for the use of leadership in transitions. In the next section, different approaches to leadership are discussed that can be exhibited to execute these six types of actions.

3.3 Promising approaches to leadership in destabilization of regimes

With Section 3.1 providing a definition of transition-oriented leadership and Section 3.2 detailing six types of action in sustainability transitions that may benefit of effective leadership, this section delves deeper into leadership literature to find approaches to leadership best suited for the six types of action, which also fit in the definition for transition-oriented leadership. In leadership literature, no single approach to leadership exists that can effectively facilitate all six types of actions from the previous section, so multiple approaches are combined in a set of different promising approaches to leadership. First, personal leadership is discussed in more detail. Next, social leadership, and three approaches to leadership that fall within this broad categorization of leadership, is discussed.

3.3.1 Personal leadership

The inclusion of *personal leadership* has been based on the observation in the Transition Space project that personal leadership takes centre stage in the process of collaborative agency. Often, new actors in the project were unaware of their own vision with regard to the sector and its sustainability. Similarly, actors often did not know what they could do to assist in the sustainability transition. Through personal leadership, they can deal with this problem. Through personal leadership, an actor may develop a vision, which allows them to take a position in a transition project and to actively contribute to the development of a shared vision in the project.

Personal leadership takes the individual as centre stage. In using personal leadership, the individual attempts to create personal goals and a personal vision. Furthermore, the individual attempts to align the activities the individual undertakes with this vision. By far the most influential and most cited work on personal leadership is the book "The 7 habits of highly effective people" of Stephen Covey (1989). In his work, Covey provides a notion on how one may develop personal leadership, which resonates rather well with the definition on leadership previously provided. Covey defines personal leadership as "the ongoing process of keeping your vision and values before you and aligning your life to be congruent with those most important things" (p. 66).

An important consideration here is the formulation of the vision of the individual. Therefore, an elaboration on what vision actually comprises is warranted. At the individual level, the vision is commonly denoted as personal vision. In its simplest form, a personal vision is the desired future of an individual. An individual forms their personal vision through a combination of three components (Boyatzis & Akrivou, 2006):

1) The image of a desired future. This consists of the articulation of the individual's dreams, aspirations, values and fantasies.
2) Hope. In their work, Boyatzis & Akrivou (2006) describe hope as the expression of optimism and self-efficacy, with the latter being their perception of what is possible.
3) Core identity. The identity of the individual is an important element contributing to the formulation of the personal vision of the individual. The historical context of an individual is part in determining the identity of an individual and as such is part of an individual's dreams, aspirations, values and fantasies (Bourdieu, 1979).

Following this, personal vision can be conceptualized as a desired future for the individual based on the identity of the individual and on both optimism and perceived self-efficacy. Covey provides a more practical notion on how to create a personal vision. He perceives personal leadership to be the tool that can be employed to formulate the personal vision. According to him, two human talents are pivotal in evolving the individual's personal leadership and as such in the formulation on one's personal vision: imagination and conscience. Imagination allows the individual to visualize the potential of the world and the individual that is not yet realized. Conscience combines universal laws and principles, structures and institutions of society, and combines these with the personal talents of the individual to determine what is possible. These two talents provide a more comprehensible idea on how a personal vision is developed by the individual.

This forges a link between the (re)formulation of individual visions (Type of action B) and personal leadership. It allows the (hybrid) actor to formulate a vision with which the actor enters the collaboration. This vision not necessarily has to be in line with the organization the individual is aligned with. However, as the focus of this work is on sustainability transitions, the vision of an individual should reflect sustainability goals with which the actor makes the decision to work towards a transition of the sector. The answer to the question as to why a sustainability transition would be part of the vision of the author would have to be sought within the actor.

Following the work of Covey (1989, p.52-64), the actor should ask how a sustainable agrifood sector fits in the priorities of the actor. An illustration to make this point clearer could be a farmer that wants to adopt crop rotation as an alternative to monoculture because they want to preserve the soil of their farm for their children. The farmer prioritizes their family to rationalize their choice for a sustainable alternative to their current practice. As such, the goals and subsequent visions are influenced by the priorities of the actor.

As Béné et al. (2019) denoted, there may be many aspects of the agrifood system that can be perceived as unsustainable, so there at least are as many possible goals an individual can imagine to change. Therefore, even for the overall goal of a more sustainable agrifood sector, an actor can adopt many different visions, all based on the individual, their priorities, the institutions and structures surrounding the individual and the imagination of the individual. It is the task of the individual to determine what the priorities of the individual are and how these relate to a sustainable regime.

With vision, personal leadership may drive an individual to work towards that vision. The vision underlies values of the individual and the actions of the individual should reflect that. The actions are taken to direct the individual to the vision, or to act in line with the vision.

Every actor has strengths in which they excel. An actor may look within the self to discover their own strengths and to relate these strengths to actions they can undertake to reach their personal vision (Northouse, 2019; Covey, 1989). Therefore, personal leadership not only entails the formulation of a vision, but requires actors to reflect on their own strengths and link these to concrete actions they may undertake to reach their vision. These strengths in turn influence the approaches to leadership an actor can adopt as social leadership, which the next section will explain.

Personal leadership as a promising approach to leadership is included in the transition-oriented leadership framework in Section 3.4. The more detailed information on how personal leadership works is used as an input for the codebook in Table 1 and Appendix B, which is used for the analyses in Section 4.

3.3.2 Social leadership

As a broad categorization of a portion of leadership literature, the term social leadership in itself has no value. To reiterate from Section 3.1, "Social leadership is exhibited by individual actors in settings of collaborative agency to influence oneself and others to develop a shared vision and take action to move towards it with the intention to improve the current system through changing the structures of the system and adapting to these changes." Many different approaches to leadership, developed by leadership scholars, can be used to achieve the goal of social leadership. All these different approaches in principle have the same goal, to create a vision, but accentuate different means to do this. I matched these different accents in the different approaches with the types of action of Section 3.2, which resulted in three promising approaches to leadership for the social aspect of transition-oriented leadership: collaborative leadership, transformational leadership and institutional leadership.

3.3.2.1 Collaborative leadership

One of the key approaches to leadership with regard to sustainability transition projects is *collaborative leadership*. The focus of this approach lies on collaboration between multiple actors to reach some goal. This approach to leadership is relatively new and is part of the shift away from individualized leadership towards a more pluralistic and emergent approach to it (Crawford, 2012; Raelin, 2018). This means that leadership no longer is exhibited by one or a few individuals and that it also is not assigned to specific actors. In the context of sustainability transition projects, it means that each actor acts as a leader, that these leadership roles are not assigned but emergent, and that through collaboration leadership groups can move to new visions.

The development of collaborative leadership is based on the idea that no single individual has all the answers and that only through collaboration with multiple leaders, a strong vision may be created and that expertise, which can be found across the many instead of the few, can provide valuable input (Kellis & Ran, 2013; Crawford, 2012). Collaborative leaders know this. They are interested in other people and invest heavily in building and maintaining networks. They collaborate with others to get results across organisational boundaries, but also work to create value from differences individual actors have (Archer & Cameron, 2013).
In projects in which different organisations collaborate towards a common goal, the process of collaborative leadership and leadership in general is not to be dominated by a single actor

(group), meaning that leadership should be shared (Miller & Miller, 2007). Employing collaborative leadership ensures commitment of all actors within a project, as all actors have some say in leading the process through providing their own vision for the future, which then is critically assessed by the other actors. Furthermore, collaborative leadership requires full participation of actors, as all are involved in decision making. Through collaborative leadership, new and unique visions may arise, as discussion could change an actor's views (Raelin, 2006).

Collaborative leadership is studied in various domains, like education and healthcare (Arthur & Souza, 2020; Markle-Reid et al., 2017; Grin et al., 2018; Kellis & Ran, 2013), but it also is studied within organisational settings (Archer & Cameron, 2013).

The various publications denote a plethora of different activities the collaborative leader undertakes. Several of these denote similar things, which when combined result in 8 main activities.

C1) The collaborative leader brings actors together (Miller & Miller, 2007). The leader identifies and brings together all relevant actors and takes responsibility for the required diversity in actors in the collaboration (Grin et al., 2018; Miller & Miller, 2007). Collaborative leaders build relationships (Archer & Cameron, 2013), which result in alliances and partnerships (Raelin, 2018).

C2) The collaborative leader negotiates difficult points (Miller & Miller, 2007), meaning that difficult decisions and other aspects of a collaboration are dealt with through constructive dialogue (Raelin, 2018).

C3) The collaborative leader handles conflict that arises in a collaboration, but also keeps other actors involved in the collaboration in periods of frustration and scepticism (Archer & Cameron, 2013; Miller & Miller, 2007).

C4) The collaborative leader deals with issues of trust and legitimacy, through things like the provision of new arguments for another point and ensuring every actor is included and is allowed to speak in the collaboration (Grin et al., 2018; Raelin, 2006).

C5) Collaborative leadership ensures an environment of transparency. Both leadership and decision-making are structured in such a way that every actor has the information and means to contribute (Miller & Miller, 2007; Grin et al., 2018).

C6) The collaborative leader steers the actors towards the creation of new visions and solutions to problems, and as such the collaborative leader aims to use the collaboration to create change (Miller & Miller, 2007; Grin et al., 2018).

C7) The collaborative leader ensures power is shared between all actors in a collaboration (Archer & Cameron, 2013; Raelin, 2006).

C8) The collaborative leader aligns the different inputs, visions, ideas, et cetera of the different actors into new unique visions (Raelin, 2018).

Collaborative leadership is relevant for several of the actions necessary in transition projects. First and foremost, 'collaborate with multiple other actors in sustainability transition projects' (Type of action A). However, especially due to the relevance of the first and eighth activities, 'create and/or transform networks' (Type of action D) and 'the alignment of visions into a shared vision' (Type of action B), are relevant.

Furthermore, collaborative leadership is related to personal leadership. Knowing oneself and one's personal vision may contribute to collaborative leadership, as a large part of the approach is about negotiating points, making decisions and aligning different visions. The other way around, collaborative leadership may also influence personal leadership. Through the processes of collaborative leadership and subsequent regime change, the individual actor is forced to revise the own mental models, and as such again will engage in personal leadership (Miller & Miller, 2007; Raelin, 2018). The interplay between shared visions, critical feedback and revised visions requires the formulation of a shared vision, which is part of transformational leadership (Raelin, 2006).

In conclusion, collaborative leadership acts as the glue and/or lubricant between the different actors and approaches to leadership. Through this approach to leadership, potential problems with a collaboration are prevented in various ways, while simultaneously it is ensured that all relevant actors are part of the collaboration.

The approach to leadership as a whole is included in the transition-oriented leadership framework in Section 3.4, wherein the link between the approach to leadership and types of actions is visualized. The relation between the approaches to leadership is included there as well. The 8 main activities presented here form the inputs for the collaborative leadership part of the codebook of Table 1 and Appendix B.

3.3.2.2   Transformational leadership

This approach to leadership is one of the more influential approaches of recent times and has been studied extensively (Northouse, 2019), although this has been done almost exclusively within the context of organisations. Within this organisational context, ***transformational leadership*** is defined as a process through which a leader engages with others and through this interaction, the transformational leader motivates and inspires others with respect to a vision (Northouse, 2019).

First described in by James Burns in 1978, transformational leadership quickly became a dominant approach to leadership in the study of organisational leadership. As transformational leadership changes and transforms people, it is theorized that its popularity stems from a shift in organisational culture towards the need of employees to be inspired and empowered to succeed themselves (Northouse, 2019). Through interactions with others, a transformational leader formulates a vision for the future that is shared and inspired by others. Of importance within transformational leadership is this vision. Brown (1998) defined a vision based on 4 elements: a vision should be directed at how the future should look like; it should be reachable so the vision should contain both abstract and more practical elements; a vision is linked to agency so the vision inspires actions that direct towards improvement and change; a vision inspires, it may be big.

In his book on leadership, Northouse (2019) discussed transformational leadership, its main activities and various studies expanding on these activities. Three of these studies are Bennis & Nanus (2007) and Kouzes & Posner (2002; 2017). The main activities associated with transformational leadership are denoted in Grin et al. (2018) as well. As with collaborative leadership, several of the elements denoted in the various studies overlap. From this literature, six main activities are drawn.

T1) The formulation of a shared vision. A transformational leader has a clear vision of the future and uses this to formulate a shared vision. The own future vision is simple, understandable, beneficial and energy-creating. Through interaction with others, be it followers or other leaders, the transformational leader creates a shared vision, based on their own vision and the vision of the other (Bennis & Nanus, 2007). Furthermore, the transformational leader listens to the vision of others and shows them how their visions can be realized (Kouzes & Posner, 2002; 2017).

T2) The transformational leader builds trust. They make their own positions clearly known and stand by them. They act in a predictable and reliable way and as such create trust (Bennis & Nanus, 2007). They use this trust to promote collaboration and enable others to act through allowing for this collaboration (Kouzes & Posner, 2002; 2017).

T3) The transformational leader stimulates others to view problems from different angles and as such to find creative solutions (Grin et al., 2018). The transformational leader further stimulates others to challenge their own beliefs and values, as well as those of the leader and the collaboration. The development of innovative ways of dealing with issues is stimulated (Northouse, 2019).

T4) The transformational leader persuades others to get along with a particular vision and ambition (Grin et al., 2018). They motivate others to commit to the shared vision and as such motivate others to transcend their own self-interest (Northouse, 2019).

T5) The transformational leader makes others open to personal sacrifice. The leader enjoys trust and respect (Grin et al., 2019), and uses this to provide a vision and a sense of mission to others (Northouse, 2019).

T6) The transformational leader creates a context for knowledge gathering (Grin et al., 2018). They listen carefully to the individual needs of the others and they act as coaches and advisors to them (Northouse, 2019).

The largest use of transformational leadership with regards to the actions of sustainability transition projects is the formulation of shared visions (Type of action B). Especially the activities directed at motivating others and stimulating others to view problems differently, may be of assistance in motivating the own organisation to be on board with change (Type of action F). Lastly, the stimulation of creative ideas may be of use in the identification and adoption of (niche) innovations to adopt that can help in sustainability transitions (Type of action C).

Furthermore, transformational and collaborative leadership are interlinked. Collaboration may be a result of transformational leadership, while collaboration also is a requirement for the development of a shared vision. The more practical aspects of a vision often include more concrete actions towards eventually reaching the shared vision. In sustainability transitions, these actions often are institutional in nature. As such, the creation of a shared vision can be linked to institutional leadership, if these actions are indeed institutional in nature. Finally, there is a link between the personal vision of an actor and the transformational leadership an actor exhibits. Through personal leadership, an actor can create a vision for their own life. According to Covey (1989), the stronger an individual exhibits personal leadership, the stronger the transformational leadership the actor can exhibit.

The approach to leadership as a whole is included in the transition-oriented leadership framework in Section 3.4, wherein the link between the approach to leadership and types of actions is visualized. The relation between the approaches to leadership is included there as well. The 8 main activities presented here form the inputs for the transformational leadership part of the codebook of Table 1 and Appendix B.

3.3.2.3 Institutional leadership

The final approach to leadership is institutional leadership. Originally conceptualized by Selznick in 1957 and gaining more traction from the 90's onward, especially through the work of Kraatz, institutional leadership is commonly associated with institutional work. Institutional leadership is concerned with establishing and/or protecting institutions (Askeland, 2020). When provided with a definition of what institutions comprise in institutional leadership literature, one may see similarities with the notion of institutions in sustainability transitions literature. An institution is a structure made up of interpersonal relationships, norms, shared beliefs, et cetera, with contested and shifting goals and which is fragmented (Kraatz, 2009). This is in line with the idea that the regime in sustainability transitions consists of the semi-coherent set of rules influencing the activities of actors in the regime that lead to reproduction of various the system which often is referred to by institutions. The goal of institutional leadership thus is the establishment and/or protection of the structure of a certain environment. Of note is that institutions may be stable at a certain time, but are prone to change over time and space as environments change, in line with sustainability transitions literature on the relation between regimes and landscapes (Da Silva, 2020). Institutional leadership contributes to this process of change within institutions (Askeland, 2020; Kraatz & Moore, 2002).

Then how does institutional leadership work? An important first step for the institutional leader is to know their own vision. Therefore, the leader must use personal leadership to know exactly what goals the institutional change need to achieve (Washington et al., 2008; Kraatz & Moore, 2002). However, due to the collaborative nature of sustainability transitions, the personal vision often is not enough, so a shared vision is formed through transformational leadership. This shared vision is used by institutional leaders to connect the actors and to create internal consistency.

A second activity of an institutional leader is to interact with a wide range of networks inside and outside the institution, as a form of network anchoring (Washington et al., 2008; Elzen et al., 2012). Through these interactions, the institutional leader attempts to create legitimacy for the institutional change. Legitimization may occur through institutional anchoring, where regulative, normative, economic and cognitive institutions are changed to be in line with both the shared vision and the socially constructed system of norms, values, beliefs and definitions (Elzen et al., 2012; Washington et al., 2008; Kraatz, 2009).

Third, institutional leaders ensure the coherence of the new institutions and maintain the new institutions after they have been developed. This involves actions like keeping the part of the population that legitimized the institutions from fragmenting (Washington et al., 2008; Kraatz, 2009). This third action, however, only becomes relevant after initial institutional change.

As the name of this approach to leadership already suggests, institutional leadership is especially relevant for the engagement in institutional work (Type of action E). Nonetheless, this leadership approach adopts elements of all previous approaches to combine into the

specific goal of changing institutions, which is an important part of sustainability transitions in the destabilization of regimes. Through both personal and transformational leadership, the actor creates internal consistency and as such creates a support base for the required institutional changes for the sustainability transition.

Next, amongst others through collaborative leadership, networks are extended. The main use of institutional leadership already presents itself in this step. The interactions in the form of network anchoring are undertaken with the sole purpose of creating legitimacy for the newly developing regime. Actors in the collaboration make contact with the right networks to facilitate institutional anchoring. This includes attempting to change regulative institutions through the creation of elements like new laws; attempting to change normative institutions by listening to society and working in the values society deems important into the new regime; and changing cognitive institutions by linking the new regime to the way individuals make sense of the sector and their own place in it.

In conclusion, through institutional leadership, all other approaches are combined into concrete goals to change institutions surrounding the new regime in order to create legitimacy for the new regime through linking of the new regime and the institutions.

The approach to leadership as a whole is included in the transition-oriented leadership framework in Section 3.4, wherein the link between the approach to leadership and types of actions is visualized. The relation between the approaches to leadership is included there as well. The 8 main activities presented here form the inputs for the institutional leadership part of the codebook of Table 1 and Appendix B.

3.4 A framework of transition-oriented leadership

I combine the above four approaches to leadership in a transition-oriented leadership framework (Figure 2). As alluded to before, both personal leadership and leadership within group processes (social leadership) are of importance in sustainability transitions, which I visualize through the distinction of the left and right side of the framework.

Every actor in a sustainability transition at some point in time should exhibit personal leadership. Through personal leadership, the individual actor develops a personal vision and identifies their own strengths and capacities in order to reach this personal vision. The main driving question for the individual is what the individual envisions for their own future and for the future of society? This process of personal leadership may result in the actor seeking change in the system they are part of. Within the Dutch agrifood system many incumbent actors, be they farmers, farm advisors and suppliers, government actors, academics, et cetera, that embark in personal leadership may discover they want to see the system change towards a more sustainable system. This insight can lead them to pursue sustainability transition projects.

Within transition-oriented projects, an early step generally is to determine the goal of the project, or more specifically what the group of actors collectively envisions for society's future and how the different actors can contribute towards this vision. Within such projects, based on their strengths, capacities and positioning, and the roles they take up within the projects, a (hybrid) actor may exhibit different approaches to leadership. For example, an actor with a strong vision for the future may exhibit transformational leadership, whereas an actor who sees the need for collaboration with other actors may exhibit collaborative leadership.

Moving back to the six types of actions (Actions A through F in Figure 2) that will have to be taken in multi-actor collaborations towards sustainability transitions in the agrifood domain, the different approaches to leadership have the potential to ensure these actions are undertaken. Through transformational leadership a shared vision can be formulated, the decision can be made to adopt certain innovations, and other parts of an actor's organisation can be convinced to be on board with the change proposed in the collaboration. Through collaborative leadership, formulated visions can be aligned, new coalitions can be created or existing coalitions can be transformed, and actors can collaborate with other actors. Finally, through institutional leadership, activities can be undertaken to change institutions of a sector.

These three approaches to leadership are highly interlinked. Institutional changes often are part of a vision, and as such, institutional leadership is related to the formulation of the shared vision and thus transformational leadership. The creation of a shared vision follows from the interaction between different actors, who discuss various elements of a system and their own visions in order to eventually align them into a shared vision, meaning that collaborative leadership is an integral part of transformational leadership. Furthermore, the creation of coalitions is part of institutional leadership as well as of collaborative leadership, meaning those two approaches to leadership relate as well.
This overlap is a logical result, as all approaches to leadership in its essence share similar goals with respect to leadership, but highlight different facets of leadership. Actors are not restricted to one approach to leadership. Based on their personal leadership and the roles they take on, an actor can use multiple approaches to leadership in one project. Finally, the leadership exhibited in a collaboration and the outcomes of the collaboration itself may affect an actor in a way that the actor will have to formulate a new personal vision by means of personal leadership.
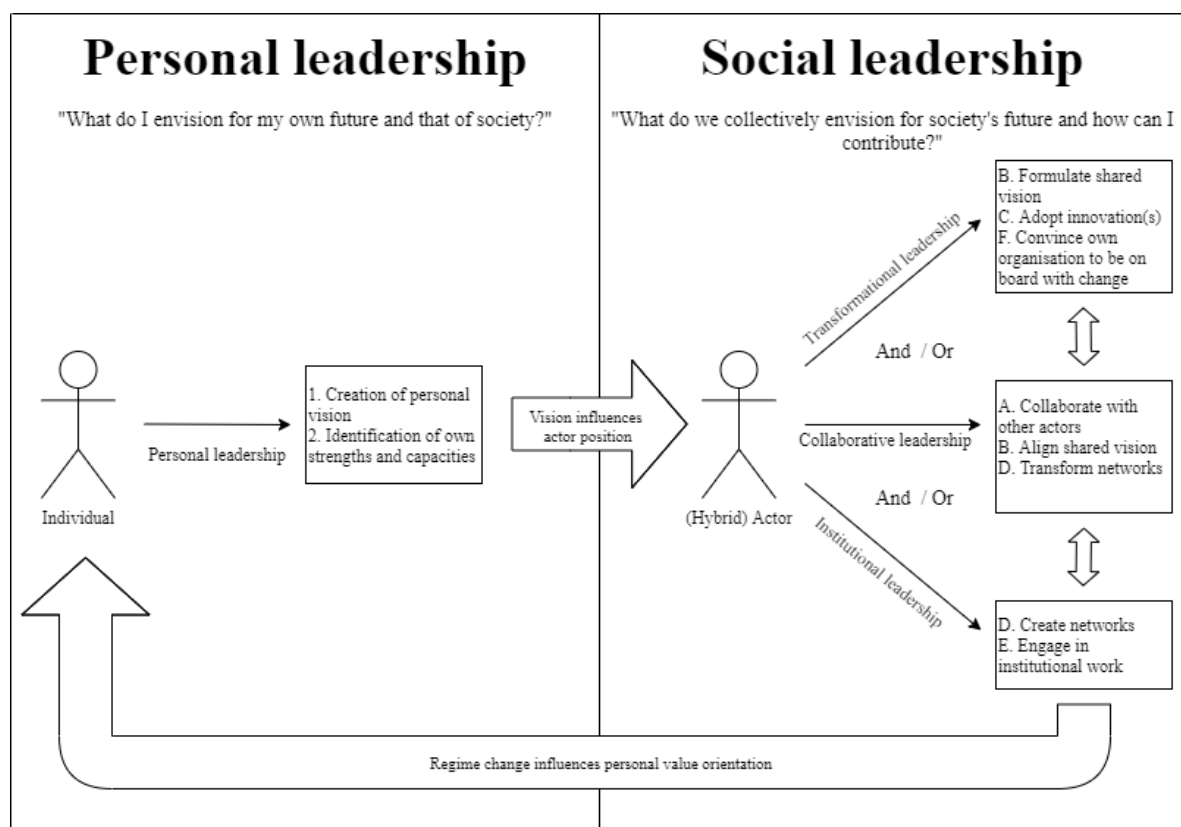

Figure 3: The framework for transition-oriented leadership

4. Results

In this section, I discuss the results of the analyses on how leadership has been exhibited in the Transition Space project, which I use to find the role of the four promising approaches to leadership in the Transition Space project in the Dutch agrifood system. First, I discuss a number of segments from the analyses and show how leadership is exhibited in these segments. Next, I discuss the frequencies of each code occurring per breakout room through differences and similarities between the breakout rooms. Finally, I discuss the interviews and the insights gained from them with regard to leadership.

4.1 How is leadership exhibited?

I discuss four segments from the network meetings in which leadership was both exhibited to various degrees and using various approaches to leadership. All four segments have been translated to English by me, as the network meetings were in Dutch. In the first segment, taken from the second year of network meetings, the actors discussed how the Dutch agrifood system would have to change in order to allow the use of short supply chains in healthcare. In the segment below, discussion arose regarding policy for this innovative concept.

Facilitator:	We have a primary producer, a health insurance company and short supply chain entrepreneurs in this session. Together, we can think of a first step, and thus to get larger companies to join, to bring the healthy food story to the consumer. What would be a first step?
Short supply chain entrepreneur 1:	We have been trying to make large companies make responsible choices for a long time, but none of them are willing to make radical changes that disrupt the field of competition. As such, I believe law makers should set frames within which supermarkets and wholesale stores can leap forward. Only a few companies are moving towards change, like Aldi moving towards 100% biological.
Short supply chain entrepreneur 2:	They change when pressure rises, for instance the sugar industry moving towards 'zero something something' products. Or they change when it becomes profitable, like with plant-based protein. The question is, what do we want with that? Do we want to join this movement, or do we keep focussing on small wins. That these eventually add up and that we can combine these to make one large change?
Facilitator:	Would that require action from the Dutch government?
Short supply chain entrepreneur 1:	Looking at it through a transition studies perspective, it's simple. We are in the third phase of market transformation. This means that existing initiatives must be connected with one another while scaling them up. The government is observing and learning how they eventually will have to organize themselves and what they need to develop to create a level playing field. Disruption and larger companies finding each other is important in this phase. I think we must ensure that at the European level, where frames are set, at the national level, which mostly distributes and monitors, and the local level, where really all complexity comes together. You have to address it from all these levels, and eventually you'll need regulation.
HAS teacher:	The interesting thing is, LNV (Dutch ministry of agriculture, nature and food safety) is one of our project partners. They recognize the need for a regulatory frame, besides initiatives from companies and citizens.

> They don't see this as the ultimate solution, but as facilitating the right direction. As an example in this food environment, think of every empty store near a school being taken over by a fast food restaurant. If this is not regulated by the government, we are not going to make it. So we need regulatory frames.

In this segment, leadership is exhibited in a number of ways. The facilitator starts this segment with an exhibition of collaborative leadership. Through their questions, they steer the discussion towards concrete discussion about a vision (an example of code C6, 'An actor steers the group towards the creation of a shared vision'). In their contribution, the second short supply chain entrepreneur does a similar thing. They focus the discussion more and ask the group for solutions on what direction they should move in with their sector (C6 & T3, being the code 'An actor stimulates other actors to come up with creative solutions towards a shared vision'), which the facilitator then specifies further.

In the remainder of this segment, actors mostly exhibited institutional leadership. In their first contribution, the first short supply chain entrepreneur expressed the need for new regulatory frames, which steered the contents of the discussion of the remainder of this segment. This was an example of I3, 'The actor attempts to change regulative institutions.' In their next contribution, the first short supply chain entrepreneur shared the role they believe the Dutch government and other regulatory bodies on different levels should take on (example of code Y2, 'An actor discusses a new role for another organisation in a new shared vision'), which they discuss to be a prerequisite for them to exhibit I3. Furthermore, they discussed the need for initiatives to come together, learn from one another and eventually scale up. They advocate the creation of coalitions (an example of I1, 'an actor creates legitimacy by extending networks'). Finally, the HAS teacher provided a little more detail regarding in what ways the regulative institutions would have to change (I3).

In the next segment, the actors discussed ways in which the invited livestock farmer could change their farm with help of farm advisors and suppliers. This was based on one of the future scenarios previously created in the project and discussed beforehand in this network meeting, and in which the farm of the livestock farmer would be placed. The segment is taken from one of the network meetings from the first year.

Facilitator:	I'm curious about the ideas of the others. With whom can [livestock farmer] work together in the integrated production system both with inputs and outputs?
Member environmental organisation:	I still have trouble with the feed. While it is a goal of [livestock farmer] to minimize the use of feed, growing grain still costs space. You mentioned your father is involved with Kipster, they use waste streams from other sectors as feed. I'm curious what you think about that, as this seems the best model to me in this scenario. Furthermore I'm curious about the medicine you use. That has to do with animal health, but it also is related to emissions. I'm curious what you do with that and if it can be improved?
Livestock farmer:	I believe waste streams are something we could invest in. We will use these whenever we can, as this is part of minimal input. I agree with that aspect of Kipster, but you must look at the entire system. The chicken grows faster when fed grain produced for that purpose

	compared to feeding them waste products. Therefore, you have to calculate how much of the feed you can replace with waste streams. I want to replace as much as possible. So, I want to balance the environmental gains from replacing grain with waste streams and the additional environmental strain from the animals that grow at a slower pace.
Facilitator	[Member animal protection agency], do you want to respond to this?
Member animal protection agency:	I was wondering if that doesn't provide opportunities. Perhaps you can opt to use other chicken breeds that thrive more on these waste streams? In such a scenario, they may still be less efficient, but that is not a problem as the feed no longer comes from specifically produced feed. This way, these fields no longer are used inefficiently.
Facilitator:	Good point. [Member ministry], what did you want to contribute?
Ministry employee:	We work a lot with arable farmers and when we discuss soil preservation, farmers mention they use break crops. They often produce grains with low yields, but that are useful in crop rotations to later produce profitable crops. Would a collaboration with such arable farmers be possible? That these farmers produce break crops you could use as feed, which simultaneously are beneficial for the soil of the arable farmers?
Livestock farmer:	Such a collaboration is possible. The problem is that I currently have a broker from which I buy my feed and who stands between me and the arable farmer, whom I would have to deal. We did arable farming ourselves for a while, but we quit this.

The facilitator started off this segment with a question for all participants for which they sought a creative solution. This is an example of both codes 'Steer group towards creation of shared vision towards change of the regime (C6)' and 'Stimulate actors to come up with creative solutions to get to the shared vision (T3).' The member of the environmental organisation responded with an obstacle they perceive to be an issue for the farmer moving towards the scenario, being that feed still costs space to produce (an example of X1, 'An actor presents an obstacle to overcome'). They immediately discuss Kipster, an innovative niche project, to be a solution to overcome this obstacle (an example of T1, 'Create a shared vision'). Next, they come up with another obstacle that is not touched upon further in this segment (X1). This shows a first instance in this segment in which someone comes up with an obstacle, which then is used as input for the creation of a vision. Similarly, both the member of the animal protection agency and the ministry employee share their vision on how to deal with the obstacle the member of the environmental agency discussed (T1 as a response to X1).

In the first contribution of the livestock farmer, they discuss the difficulty they perceive in becoming sustainable with their inputs. They weigh environmental benefits of using waste streams against environmental benefits of the chickens having a shorter time in which they grow. They further state that they make this decision consciously and imply with their first sentence in which they state they *could* start using waste streams that they currently prefer the environmental benefits of chickens having a shorter growing time. This is an example of the code 'An actor vocalizes their personal vision (P4).'

The third segment is taken from one of the network meetings of the second year, in which a number of actors came together to discuss five institutional arrangements. They were asked

which arrangements they would prefer to be implemented and why. Based on these questions, discussion sparked.

HAS teacher:	What I recognize is several things coinciding. I see true cost accounting as being one level above that. What triggers me in [previous speaker's] story is the following: there is a difference between true price and true cost accounting. True pricing means placing a price on an externality, on an effect of production. True cost accounting on the other hand is more about transparency in the chain and providing insight in what is happening. This not necessarily means getting the price for the externality paid, you could also use the results of true cost accounting to create activities that can prevent these costs from being made. It is not only about paying for these costs. I think that is important context to share.
Facilitator:	If I understand you correctly, all these institutional arrangements are some sort of true pricing, because they transform externalities into part of the price for a product?
HAS teacher:	It may be the case for instance with an ecosystem service that has a certain cost, that the cost of this service is not the same as the price for the damage. [Example to clarify this point]. It is not about ensuring the consumer pays for the costs, it is about creating transparency in the chain, and to use this as basis to develop other activities to mitigate these costs.
Facilitator:	So it is a cost perspective to change chain activities? And not necessarily that the consumer sees this back in the price they pay?
HAS teacher:	Not one on one indeed. If my cost is x, that does not mean the consumer pays x. This cost may be y, if we create an intervention which costs y somewhere in the chain that mitigates x.
Facilitator:	So true cost accounting is the logic based on which you would implement something like a meat tax. Meaning that true cost accounting is dissimilar to the other institutional arrangements.
HAS teacher:	Indeed.

In the small discussion above, leadership is exhibited by the actors in a few ways. First of all, the HAS teacher recognized a misunderstanding about the way true cost accounting, one of the institutional arrangements, was understood. They took initiative, based on their own expertise from their position as teacher, to explain the concept in order to make sure every actor had the same information in decision-making. This is an example of the code 'Make sure both leadership and decision-making are transparent towards all actors (C5).' The knowledge this teacher has was derived from their position as teacher, for which they require certain knowledge and expertise. This is an example of this actor capitalizing on the code 'Discover own strengths and capacities (P3).' Near the end of the segment, the facilitator summarizes what they have heard and try to combine this new information on true cost accounting with the other institutional arrangements into a new configuration of actions. This is an example of the code 'A proposed shared vision is aligned with the vision of another actor (C8).'

The final segment shows a discussion in which little leadership is exhibited. This segment is taken from a network meeting from the first year and discusses how one of the primary producers invited to the network meeting would fit in one of the future scenarios for 2050 elaborated on in the network meeting.

Facilitator:	I am curious, based on what [primary producer] discussed about responsibility, what your thoughts are on this [advisor]. I see [advisor insurance company] wants to speak first.
Advisor insurance company:	I have been listening and want to react. When listening to their story, it looks like [primary producer] just wants to be in control. However, based on their objectives, it seems they want to uphold a formula. They want to deliver quality and develop new breeds, which they want to do as well at the relevant bulb producers. This may look like a company of someone who wants complete control, but it is actually inspired by a different perspective. I believe that to be the aim of this way of management, and not that [primary producer] wants full control.
Facilitator:	Thank you for summarizing. On the one hand, it is responsibility for one another and care. On the other hand, people may experience this as being forced to be puppets of [primary producer]. I'm curious about [advisor]. How they experience their collaboration with [primary producer]. Their role is different, so [advisor], could you share your thoughts?
Advisor:	You ask about the collaboration between our company and [primary producer]. I believe that to be going well, because we both act at a certain level. We can complement one another, which is the power of both companies.
Facilitator:	Do you experience a responsibility to exhibit leadership?
Advisor:	That's difficult. [Primary producer] is the company. But if you look at the future, with all questions we currently face, I could indeed exhibit more leadership. I do that a little bit, with a few producers that produce for [primary producer]. When I see they slack off, I act and communicate to [primary producer] that these producers perform less and why this is the case.
Facilitator:	You mean regarding sustainability aspects?
Advisor:	Many aspects exist. You can look at technical aspects, but also at sustainability. Large differences exist between producers. [Primary producer] wants to create a standard in this. I recognize that.
Facilitator:	[Primary producer], what is your take on this? And can you share your thoughts on how you will fit in the future scenario? So when focus shifts to more circularity, what role do you see for yourself in that scenario?
Primary producer:	I share the perspective of what [advisor] just said. And [advisor insurance company], thank you for your addition. You are right. I'm not sure how we will fit in the future scenario. I think flowers will become even scarcer with population growth and arable land being reallocated to become nature. I believe the policy of our province is that 250 hectares of arable land is to be converted to nature annually. For the flower bulb sector, this means land will become scarcer each year, meaning we have to intensify production even further. I'm glad

to no longer be entrepreneur in 2050, because the future of smaller industries like the flower industry looks bleak.

The facilitator starts in the segment by asking the advisor specifically to share their thoughts. They did this because the advisor up until then had not contributed yet to the discussion. This is an example of the code 'An actor ensures shared and equitable decision-making, and deals with issues of trust and legitimacy' (C4). Next, the advisor answers a number of questions and discusses how they are involved in the management of the company of the primary producer. The facilitator keeps asking for more detail and asks about leadership, but the discussion remains fixed upon management. As their final contribution in this segment, the primary producer eventually steered the discussion back to the creation of a (shared) vision (code C6) by asking the primary producer how they would fit in the future scenario. As a response, the primary producer discussed an obstacle for the flower bulb sector that must be overcome if their company still wants to exist in the future (example of code X1, 'A participant presents an obstacle to overcome).

During the parts of the discussion in this segment that focused on the management of a primary producer, no leadership was exhibited. The focus was on how things are currently done, not on the creation of a vision.

Altogether, based on analysis of these four segments and the remainder of the network meetings, I have distilled a few notable displays of leadership. First, in the initial stages of the transition project, more transformational leadership was exhibited. During later stages of the project, more institutional leadership was exhibited. Second, collaborative leadership was most frequently exhibited by facilitators. Third, many participants shared obstacles that would hamper reaching a vision. These obstacles have motivated other participants to exhibit leadership, for instance by showing transformational leadership in creating a new vision to overcome the obstacle. However, the existence of an obstacle does not by definition precede leadership. Fourth, at least in some instances, the network meetings show that participants exhibit leadership based on the strengths, capacities and positions within the sector they have. Fifth, through collaborative leadership, different visions and actions can be aligned into a single shared vision. Sixth, when little leadership is shown, more collaborative leadership may inspire other participants to exhibit more leadership themselves.

4.2 Different leadership in different network meetings

While the previous section discussed specific segments of the network meetings in detail, I take a wider perspective here and discuss some overall patterns that occurred in all meetings. First, two frequency tables of how often each code was given in each breakout room of each network meeting are provided. The results of these tables are then discussed through the findings that stand out most.

In Table 2, the frequencies of the various codes from the codebook (See Table 1) are visualized. In the table, only 1 network meeting is included, with the remainder being in Appendix C. Each row corresponds to one breakout room of a network meeting. Table one shows the breakout room labelled 'Year 1.1.' This means that the breakout room was one the breakout rooms from the network meetings of year 1 of the Transition Space project. The time below the label shows how long discussion in the breakout room was. The number next to each code shows how often the code occurred in the breakout room. So for example, 'P2 = 3' means that code P2, which

according to Table 1 corresponds to 'An actor questions how a future vision would factor in the life of the actor' occurred three times in the breakout room. The bold numbers at the bottom of the row shows a summation of how often each approach to leadership occurred. For example, 'T = 16' means that transformational leadership occurred sixteen times in this breakout room.

Breakout room Year 1.1 100 minutes	Frequency per code			
	Total frequency personal leadership	Total frequency collaborative leadership	Total frequency transformational leadership	Total frequency institutional leadership
	P1 = 0 P2 = 3 P3 = 13 P4 = 3	C1 = 1 C2 = 0 C3 = 0 C4 = 1 C5 = 0 C6 = 3 C7 = 0 C8 = 1	T1 = 12 T2 = 0 T3 = 1 T4 = 2 T5 = 1 T6 = 0	I1 = 0 I2 = 0 I3 = 0 I4 = 0 I5 = 0 I6 = 0 I7 = 0
	P = 19	**C = 6**	**T = 16**	**I = 0**

Table 2: Partial frequency table main codes per breakout room

Table 3 shows the frequencies of the codes in the 'other' category of Table 1, with the remainder in Appendix D. The table can be read as Table 2 in that it first shows which breakout room from which year of the project is discussed in the row. The length of the breakout room is shown and per code, the frequency of it occurring in the breakout room is given.

Breakout room	Frequency table		
Year 1.1 100 minutes	X1 = 6 Y1 = 0	Y2 = 0 Z1 = 0	Z2 = 0 Z3 = 0

Table 3: Partial frequency table other codes per breakout room

The results of these tables can be categorized into four groups: Frequent codes; differences between breakout rooms; overlap in codes; and missing codes. These are discussed in order below.

4.2.1 Frequent codes

One of the codes that most frequently occurred has been P3 ('an actor discovers or capitalizes on their own strengths and capacities'), combined with P4 ('an actor vocalizes their personal vision'). This is by design of the network meetings. At the start of each breakout room, all participants shared who they are and how they are positioned in the field to facilitate change. Through this, they thus shared their positioning, and as such showed P3. Similar with P4. Often, part of the objective of a network meeting was to also get to the underlying values of the participants on where they base their perspectives on. Due to facilitators asking about these values, P4 was exhibited regularly.

Another code that came up often, is T1 ('an actor creates a future vision for the system'). While it is true that leadership by definition entails the creation of a vision, the literature on transformational leadership explicitly discussed the creation of a shared vision as an important activity in its leadership. As such, each time a participant came up with a vision to be aligned

into a shared vision or came up with an action towards the vision, the participant exhibited T1. Furthermore, each time a participant proposed to use a certain innovation to reach a vision, which happened in four of the breakout rooms, the participant exhibited T1.

The code that occurred a lot was X1 ('an actor presents an obstacle to overcome'). This code was given each time a participant shared an obstacle within the current system or a vision of how the system could look. As part of the network meetings, by design, were about the identification of opportunities and obstacles, it was expected for X1 to occur frequently. Furthermore, through the collaborative nature of these network meetings, a participant often came up with an obstacle in moving towards the vision another participant discussed, which in turn could lead to new or different visions.

So, both P3 and P4 occurred a lot due to discussion on positioning of actors and active questions on underlying values of participants respectively. T1 occurred often as the creation of visions in the network meetings all have been with the intention of creating a shared vision. And X1 occurred often as this was by design and through the nature of collaborative work on vision creation.

4.2.2 Differences between breakout rooms

A first striking difference is that more transformational leadership was exhibited in year 1 of the network meetings and more institutional leadership was exhibited in year 2. Regarding collaborative leadership, based on who took on the role as facilitator, some differences could be observed. One facilitator showed more C8 ('an actor aligns different visions into a shared vision'), while other facilitators were more prone to exhibit C2 ('an actor helps negotiate the decision-making process'). The few times conflict occurred, these were dealt with through C3 ('an actor handles conflict between actors in the group').

A few differences can be observed in collaborative leadership. Year 1.3 saw more collaborative leadership, while in breakout rooms year 1.1 and year 2.3, less collaborative leadership occurred. The reason for this is that the participants in the latter two breakout rooms already exhibited a lot of leadership and collaborated towards the goals of the network meetings. In year 1.3, on the other hand, more collaborative leadership had to be exhibited in order to stimulate the other participants to exhibit leadership.

Regarding institutional leadership, in some breakout rooms, the emphasis was on the formation of coalitions, wherein several participants exhibited I1 ('an actor creates legitimacy by extending networks'). In other breakout rooms, the emphasis was more on institutional anchoring, wherein several participants exhibited institutional leadership based on codes I3 through I6 (Actors attempt to change regulative (I3), normative (I4), cognitive (I5) and economic (I6) institutions). These differences in emphasis occurred because different participants steered the discussions into different directions. For transformational leadership, T2 ('An actor builds trust between actors, by making their position clear and by standing by them'), T4 ('An actor motivates other actors to get along with the own vision') and T5 ('An actor inspires other actors to be more open to personal sacrifice in pursuing a shared vision') sporadically were used to get others on board with a proposed vision or action. Whether transformational leadership was exhibited also differed per participant.

So, depending on which year the network meeting took place in, and as such what the goal of the network meeting was, either transformational or institutional leadership was represented more. Furthermore, different activities of collaborative leadership were required based on how the network meetings evolved.

4.2.3 Overlap between codes

Due to the different approaches to leadership all focusing on leadership, overlap in the codes could be expected. Here, two main kinds of overlap occurred. The first one being between C6 ('an actor steers the group towards the creation of a shared vision') and T3 ('an actor stimulates other actors to come up with creative solutions towards a shared vision'). Both of these codes involve steering others towards a shared vision, but both emphasize different elements of this activity. C6 is mostly about directing the group discussion towards a discussion better aimed at creating a shared vision, while T3 has a transformational leader involving another participant in coming up with a solution specific to the creation of their vision. T3 as such may as well be seen as part of C6.

The other overlap is between institutional leadership and T1 ('an actor creates a future vision for the system'). Part of T1 is the creation of activities towards a shared vision. All codes of institutional leadership are actions towards a vision, albeit only based on institutional change. Therefore, each time a participant came up with an action towards moving to a vision, this was either coded as institutional leadership if it comprised an institutional change, or transformational leadership, if the action was more practical in nature.

In conclusion, collaborative, transformational and institutional leadership all overlap to some degree, meaning that different codes have some degree of overlap as well.

4.2.4 Missing codes

Some of the codes did not come up in the network meetings, for varying reasoning. Discussing them one by one: P1 ('an actor formulates a personal vision for the future') did not occur. Personal leadership was only exhibited by innovative farmers, or when specifically asked about by facilitators. Still, the creation of a personal vision did not occur. C7 ('an actor ensures power is shared between all actors') did not occur specifically in certain aspects of the network meetings, it occurred at all points as the meetings were designed that way. T6 did not occur as well. Through interpretation of this activity, T6 ('an actor creates a context for knowledge gathering') would require transformational leaders to act as coaches and/or advisors, something that did not happen in the network meetings.

I2 ('the actor influences third parties to engage in institutional change') by nature of the network meetings could not happen. Third parties have not been influenced in the meetings themselves, as third parties are not involved. However, this form of leadership may have occurred outside of the network meetings. I7 ('an actor creates internal consistency and support base for institutional change') was not found as a code, as this code comprises participants exhibiting personal and/or transformational leadership, which already was coded. All 3 Z codes did not occur. These codes discuss how a participant to network meetings has their personal vision affected by the network meetings or how personal leadership resulted in them joining the network meetings. Both these things were not discussed in the network meetings themselves. However, in the plenary sessions after these breakout rooms, numerous participants expressed their personal visions had been changed due to the discussion in the breakout rooms (Code Z1, 'A new insight from the transition project influences the personal leadership of an actor').

By nature of these network meetings, the leadership exhibited by the participants towards the own organisation, one of the six actions that should be undertaken in multi-actor collaborations towards sustainability transitions, cannot be exhibited in the network meetings.

In conclusion, several codes did not occur in the network meetings due to various reasons. Some codes did not occur due to limitations of the network meetings themselves. Only T6 did not occur through a reason that cannot be explained through the design of the network meetings.

4.3 Interviews

In order to be able to validate the entire transition-oriented leadership framework, three additional interviews were conducted with project partners to fill in the two main gaps, on personal leadership and on the missing action as detailed in the previous section. First, personal leadership will be discussed, followed by leadership towards the own organisation. I have translated quotes in this section to English, as the interviews have been conducted in Dutch.

4.3.1 Personal leadership

All three interviewees exhibited personal leadership prior to the network meetings. At some point before the project itself they all created their personal vision (Code P1, 'An actor formulates a personal vision for the future'). The way these visions were created differed slightly for all interviewees. One had their vision largely influenced by their upbringing and as such their identity, to the point they switched careers: "It has to do with upbringing, how you are brought in this world, what your parents' worldviews are and how you navigate in that. My parents both are left oriented and socially engaged. I recognize that back recognize that in myself". Another had their vision largely influenced in an, in their words, enlightening discussion they had with someone in their network: "I spoke with an organisation providing leadership trainings, on value-oriented leadership, and that forced me to think about what I believe to be important in the world and what I myself want to do and to contribute. I started to think about what is important to me." The third interviewee based their vision on a few specific events of their past: "Where I truly learned [that people can do more than they think] was when I was working with handicapped people. I left thinking I was the one who needed to help them with everything. When I sat down after a long day, someone else made a cup of coffee for me and someone else put on some music. That's when I learned to look at what people can do instead of what they can't do."

The development of the personal visions has led each of these interviewees to become the ones within their organisations to be involved in the Transition Space project (Code Z3, 'An actor their personal vision stimulated them to be involved in a sustainability transition project'). They either took initiative or were asked for the project, but all were interested in sustainability transitions, which for all derived from their personal vision: "Then I thought, [sustainability and transitions] is something I want to do more with and I followed the transitions masterclass. After that my manager said: We have a project we are part of, but we currently have no-one actively taking part in it. Isn't that something for you? That's why I'm part of this project."

In a similar manner, the strengths, capacities and positions of the interviewees were of influence in the leadership they would exhibit in the project (Codes P2 and P3, respectively 'An actor questions how a future vision would factor in the life of the actor' and 'An actor discovers or capitalizes on their own strengths and capacities'). One interviewee mentioned one of their strengths to be their ability to take a helicopter view. They used this ability in the project to bring the right actors together in the project: "I have the ability to take a helicopter perspective and to use this to bring discussions and activities to the core of what is required. [...] If you take a helicopter perspective, you see what course of action has the most impact at

each moment. […].I contributed a lot in the discussion on the approach we would take and which actors would be required for that. Which group composition would be necessary in allow interesting discussion with a broad range of inputs to get to the future scenarios" (Codes Z2 and C1, respectively 'An actor uses their personal leadership to exhibit different leadership in sustainability transition projects' and 'An actor brings other actors together').

Another actor stated they cannot fully separate their personal vision with the way their organisation works. That due to their affiliation with their organisation, they do not always say and do what they think. They still exhibited leadership in the project, but this is not fully linked with their personal leadership: "I think that the place I work brings certain expectations regarding my contributions to the project. What I say and what my opinions are is often seen as the opinions of my organisation. […]. When I'm somewhere, I don't always say everything I think as this may contrast with things my organisation is working on and I'm involved in the project on behalf of my organisation, not on a personal title."

The second interviewee further discussed how their work in the Transition Space project over time has resulted in them having a different view on the system, how it should look like in the future and especially what their contribution can be: "When you are involved in such a [transition space] project, you will start to see things in other aspects of your life and other parts of your organisation that go well. Or not well at all. You just start seeing that. […]. So what you do by being involved in such a project, you immediately link that to other parts of your life." (Code Z1, 'A new insight from the transition project influences the personal leadership of an actor').

4.3.2 Leadership towards own organisation

The interviewees also were specifically asked about the feedback they provided from the project towards the own organisation. Two of the interviewees share the results of the project with specific parts of their organisations: "It is mostly just sharing [of results]. And showing enthusiasm that my organisation is willing to step in this kinds of projects." No leadership is involved. However, one of these two interviewees did denote that the output of the project is used as one of the inputs for the creation of the vision of their organisation: "[the transition space project] is a potential building block for the development of the vision of my organisation." (Code T1, 'An actor creates a future vision for the system').

The third interviewee placed themselves more as a connector between the ideas of the project and the ideas of their organisation. Project ideas are incorporated in their own division and vice versa. The main leadership activities identified in this feedback provision is convincing others within their organisation of these new ideas: "That is through [other within their organisation], that they will take up [what we learn from the project]. For instance that a client of us has a problem and that we relate that with the project we are in. To connect the lines between the project and our organisation." (Code T4, 'an actor motivates other actors to get along with the own vision') and the creation of legitimacy (Code C4, 'an actor ensures shared and equitable decision-making, and deals with issues of trust and legitimacy'). They denoted that the ideas of the project already have changed the way the organisation functions, due to a change in normative institutions, as they now work with more values society deems important: "[through the project] you can emphasize on good issues, that you emphasize issues the client has to deal with. I can use that, together with the outcome of this project to connect the issues with our organisation and as such create more support base within our organisation [for these issues]." (Codes I4, 'The actor attempts to change normative institutions' and T1 respectively).

5. Discussion

Section 5.1 discusses the transition-oriented leadership framework and if it holds up based on the case study. Section 5.2 discusses a number of observations made from the analyses on how transition-oriented leadership can be stimulated in transitions. In Section 5.3, wider implications for the field of transition studies are discussed and finally in Section 5.4, this work on transition-oriented leadership itself is critically reflected upon.

5.1 The transition-oriented leadership framework

In the literature study, I theorized the transition-oriented leadership framework to be able to describe how leadership is exhibited in transition-oriented projects (See Figure 2). Therefore, the first question discussed is whether this framework holds up. As the framework has been created based on the first two sub-questions, being "What types of actions in the destabilization of regimes phase of sustainability transitions can be stimulated through leadership," and "What approaches to leadership are most promising to stimulate these activities," I will discuss both questions and how they are answered through the results.

Regarding the first sub-question, for each of the six types of actions an actor can undertake, as described in Section 3.2, I found evidence that these actions have been undertaken in the Transition Space project through actors exhibiting leadership. As I discuss below, the results verify the transition-oriented leadership framework. All four approaches to leadership have been identified and relate to the six types of actions in transition-oriented projects I identified.

A. Collaborate with multiple other actors in sustainability transition projects: The most revealing evidence for this activity occurred often and has been discussed in Section 4.1. Each of the meetings has had a common goal the participants of the meetings were working towards. What is notable is that the participants of network meetings often got to these goals by adding on one another. Through (constructive) discussion ('an actor helps negotiate the decision-making process,' code C2), the participants could discuss an obstacle and eventually turn it into a vision (second segment Section 4.1). Multiple different collaborative leadership activities have been used to stimulate collaboration. With facilitators often asking other actors for their inputs ('An actor ensures shared and equitable decision-making, and deals with issues of trust and legitimacy,' code C4), steering discussions back to the question at hand ('an actor steers the group towards the creation of a shared vision,' code C6), or even the handling of conflict between other actors ('an actor handles conflict between actors in the group,' code C3) (Section 4.2), collaborative leadership allowed for effective collaborations between actors to take place.

B. (Re)formulate and align visions, both individual and as collective: This activity occurs threefold. First, actors exhibit personal leadership to formulate a personal vision (Section 4.3.1). Second, actors in collaborative settings share inputs to a shared vision and/or build on inputs of others to collectively create a shared vision, which they did through transformational leadership (Section 4.1). Third, actors align different visions into one large shared vision, which occurs through collaborative leadership (Section 4.2).

C. Adopt innovations: In the process of creating shared vision, in numerous breakout rooms, the necessity of adopting innovations in reaching these visions was discussed

(Section 4.2). Through transformational leadership, actors discussed the need for innovations and attempted to include them in the shared vision.

D. Create and/or transform networks: In many breakout rooms, actors expressed the intention to include new actors in the project itself ('an actor brings other actors together,' code C1) or to create new coalitions to work towards a shared vision ('an actor creates legitimacy by extending networks,' code I1) (Table 2). The presence of these leadership activities suggests the intention of actors to either transform the project network, or to create new networks altogether. As such, networks are created through actors exhibiting both collaborative and institutional leadership, although collaborative leadership was exhibited more frequently in pursued of the creation of networks.

E. Engage in institutional work: The presence of the I-codes, which correspond to the suggestions of actors to engage in institutional changes, acts as evidence that actors in the project engage in institutional work through institutional leadership.

F. Motivate the rest of the actor's organisation to be on board with change: During the interviews, it became evident that some of the interviewees exhibit leadership when providing feedback of the project in the own organisation. This was done especially through convincing others in the organisation of the ideas discussed in the project in their vision and through the creation of legitimacy (Section 4.3.2). The former is an example of transformational leadership, whereas the latter is collaborative leadership.

In the discussion on the six types of actions above, the role of specific approaches to leadership has been alluded to. This reflects the second sub-question: 'what approaches to leadership are most promising to stimulate these types of actions.' How the different approaches to leadership can result in undertaking these types of actions can be interpreted as follows: Through personal leadership, an individual actor develops a personal vision, prior to the transition project. This vision and the position of the actor within their organisation eventually influences them to join a transition-oriented project. Based on their role (more on this in Section 5.2), actors can exhibit different leadership approaches, to execute one or more of the six types of actions.

Through exhibiting transformational leadership, an actor can help formulate a shared vision; influence the adoption of an innovation in moving towards the shared vision; and convince the own organisation of the vision discussed in the project to change the vision of the organisation. Through exhibiting collaborative leadership, the actor can align various visions into a single shared vision; transform the existing project network; and stimulate the collaboration between actors in the project. Through exhibiting institutional leadership, the actor can create new networks to facilitate institutional change; and engage in institutional work.

There is, however, a nuance. As discussed in Section 4.2, not all codes in the codebook have been coded in the analyses. This has been especially true for the codes 'an actor creates a context for knowledge gathering' and 'an actor ensures power is shared between all actors' (codes T6 and C7 respectively). Furthermore, some codes were discovered more frequently than others. These two notions suggest that while the approaches to leadership discussed in this thesis can explain what is happening in transition projects in terms of leadership, they are not a one-on-one fit with the context of transitions and transition-oriented projects in this regard. The four approaches to leadership I use in the framework, which are not specifically developed for transition-oriented projects, promote actors to exhibit certain behaviours. Due to these approaches not being developed for transitions, not all behaviours of the approaches to

leadership are required, resulting in several activities related to the different approaches to leadership being exhibited more frequent than others.

Furthermore, an important point of consideration is the link between personal vision and shared vision. In the framework, I theorize that personal vision directly influences the way in which an actor contributes to the formulation of a shared vision. However, no evidence has been found as to what extent this is true. Furthermore, based on interviews, evidence has been found that the vision of the organisation an actor is connected to influences the formulation of a shared vision as well.

The next sub-question to answer is the third: "How do these promising approaches to leadership take place in transition-oriented projects?" This question already partially has been answered in the previous question through the sequence of approaches to leadership resulting in the six different types of actions actors can undertake to foster a sustainability transition in the destabilization of regimes phase. However, there is more to it. My results suggest a cyclical link between personal and social (transformational, collaborative and institutional) leadership. Through exhibiting personal leadership, an actor can be motivated to become involved in sustainability transition projects (Section 4.3.1). The other way around, several actors in the Transition Space project discussed how their work in the project has influenced their personal vision (Section 4.2). This suggests that these actors have exhibited personal leadership and as such changed their personal vision based on new things they have learned in the project.

Looking at leadership from a transition-oriented project perspective, all four approaches to leadership have distinct implications for the way in which such projects develop. Firstly, transformational leadership is important in creating a shared vision of what the system should look like in the future and how the project and actors in the project can act towards this vision. Secondly, as transition projects tend to aim for systemic change, institutional work is an important category of actions to undertake in moving towards created shared visions. In the Transition Space project, which is set in the destabilization phase of the Dutch Agrifood transition, institutional work frequently was discussed. Institutional leadership can provide support in discovering what actions to undertake as forms of institutional work.

Thirdly, collaborative leadership is especially important in aligning different visions, bringing actors together in (new) networks and to stimulate collaboration between actors.

Fourthly, more on an individual level, personal leadership can assist actors in discovering what it is they want in the future and can assist them discover how their positioning, strengths and capacities can assist them in moving towards the vision. While there may be a discrepancy between personal vision and shared vision, the actor still gains more insight in how they can contribute in moving towards a shared vision through personal leadership.

Another implication from a project perspective shows that different approaches to leadership are dominant in different phases of a project. In the Transition Space project, the focus of the first year of the project was to get action perspective based on future scenarios. Here, the creation of a shared vision and how participants of network meetings could contribute to these visions was an important consideration. As such, transformational leadership was dominant. In the second year, the potential of more concrete activities was assessed. This meant that the focus shifted more towards institutional change and the formation of new coalitions to allow for institutional change, hence institutional leadership becoming more dominant. This idea of

different approaches to leadership being dominant in different project phases is not new in scientific literature and is in line with other research on leadership in projects in which multiple organisations are involved (Kramer et al., 2019).

5.2 Fostering leadership in transition-oriented projects

The final sub-question to answer is "how can the promising approaches to leadership be stimulated in transition-oriented projects." Based on the results of the leadership exhibited in the Transition Space project, I made three observations regarding ways in which the leadership exhibited by actors in transition-oriented projects is fostered in the Transition Space project.

Observation 1:   Certain context circumstances, being avoidance of discussion on management and identification of obstacles to overcome, may contribute to stimulating project participants to exhibit leadership

During the analyses, a number of circumstances have been identified that either hamper leadership or can work to foster leadership. One of the circumstances that can hamper leadership to be exhibited, is an emphasis within discussions on management. As has been discussed in Section 3.1, a difference exists between management and leadership. As such, focusing a lot on management of systems, as happened in the final segment in Section 4.1, reduces the time in discussions in which leadership can be exhibited.

A second circumstance is related to the identification of obstacles to overcome. In every network meeting, many obstacles were mentioned. Often, these obstacles acted as stepping stones for the creation of a shared vision, and as such foster leadership. An interaction that occurred often was one actor mentioning an obstacle, on which another actor then based a vision (Section 4.1). However, only mentioning obstacles is not enough, it not necessarily has to lead to new visions. Actors not automatically exhibit transformational leadership after an obstacle is identified, so exhibiting collaborative leadership may be required to stimulate other actors to exhibit transformational leadership. Obstacle identification thus is a requirement for transformational and institutional leadership, but collaborative leadership may be necessary to motivate actors to exhibit these approaches to leadership in response to obstacles being identified.

Observation 2:   The strengths, capacities and position of an actor influence which approaches to leadership an actor exhibits in a transition-oriented project

This observation is based on the way several actors exhibited leadership during the network meetings. Two examples shed light on how the strengths, capacities and position of an actor determine what leadership the actor exhibits. During the interviews, one of the interviewees discussed one of their strengths to be the ability to take a helicopter view (Section 4.3.1). They further made clear that they used this strength in the project to include other actors they thought were important and to exhibited other activities of collaborative leadership. As such, they directly used one of their greatest strengths to exhibit one of the approaches to leadership.

The second example came from one of the actors discussed in the third segment (Section 4.1). In this segment, the actor made use of their position in the field to share their knowledge about one of the topics that were discussed, true cost accountancy as new economic institution. They exhibited collaborative leadership in a specific activity, created transparency in what was

discussed. Eventually, this culminated in them exhibiting institutional leadership to reformulate true cost accountancy as analytical tool to create transparency for farmers in externalities to create an argument for the use of other institutional changes.

What these examples show is that strengths, capacities and position of an actor at least to some extent seem to influence which approaches to leadership they exhibit. Which approach to leadership an actor exhibits thus differs per actor. It may occur that a single actor can exhibit all four approaches to leadership, but this is not always true.

Observation 3:   Facilitators and guiding questions have a vital role in stimulating leadership in transition-oriented projects

In the analyses of the network meetings (Section 4.2), it was observed that collaborative leadership was mostly exhibited by facilitators. Two of the main roles for the facilitators in the network meetings have been to make sure every actor contributed to the discussion and to ensure the discussion did not divert too much from the question at hand. These two roles perfectly match with two of the activities of collaborative leadership ('an actor ensures shared and equitable decision-making, and deals with issues of trust and legitimacy' and 'an actor steers the group towards the creation of a shared vision,' codes C4 & C6 respectively). The other actors in the network meetings were more prone to take on another role and exhibit transformational and/or institutional leadership, due to them being invited with the question if they could share their perspectives on the guiding questions of the network meetings. Due to the importance of collaborative leadership as the metaphorical glue/lubricant of leadership in transition-oriented projects, and the way different roles seemingly are allocated in transition-oriented projects, the observation here is that facilitators and their guiding questions have a vital role in stimulating leadership in transition-oriented projects.

In conclusion, I hypothesize that the different approaches to leadership which are exhibited in transition-oriented projects are influenced by which actors are involved. This is further reaching than which organisations are involved, as each individual actor has different strengths and capacities as well, which might influence what approaches to leadership they will exhibit. Based on the intended goal of a project, actors ideally are selected based on their strengths, capacities and/or positioning to be of use towards the goal set out for the transition-oriented project. There thus is an interplay between numerous elements in transition-oriented projects that influence how effective leadership can be in transition-oriented projects. In a (network) meeting, the goal of the meeting and subsequent guiding questions, the phase of the project this meeting is in, and actors involved in the meeting combined determine how leadership is exhibited, thus how visions and actions towards the vision are created.

This means that actors require personal engagement and capacity to act on an institutional level. For the former requirement, personal leadership is important, whereas for the latter requirement positioning is important. Furthermore, personal leadership helps actors in determining what actions they can undertake and how they can act on an institutional level.

5.3 Transition-oriented leadership in transition studies

A final notion on the results with regard to transition-oriented leadership are the implications for the field of transition studies. First, I discuss the implications for the destabilization of regimes phase of transitions. In this phase, as discussed in Lodder et al. (2017), incumbent

actors start to try to change the current regime as they start to acknowledge increasing pressures on the regime. Following Beers & Loorbach (2020), both incumbents and niche actors come together in new coalitions to enable institutional work as a way to change the system. The role of vision changes in this phase to a role wherein the consequences of a transition pathway are envisioned for each actor individually.

Transition-oriented leadership is a form of agency that can assist actors in this phase in multiple ways. First, it can contribute in creating a shared vision in the form described above. Second, through transition-oriented leadership, actors can identify and create new coalitions. And third, actors can discover what institutional work is required and how to do it. These three uses all are benefitted by the fact that transition-oriented leadership allows for successful collaboration between both regime and niche actors in achieving these uses. The transition-oriented leadership framework is a tool that can assist in creating more insight in the leadership that is exhibited and/or needed in transition-oriented projects.

This work on transition-oriented leadership has implications for the wider field of transition studies as well. Transition-oriented leadership as a form of collaborative agency is a concept that has only been discussed little in scientific literature (Raelin, 2016; Craps et al., 2019), or transition literature (Grin et al., 2018; Proka et al., 2018). As such, transition-oriented leadership provides an interesting new avenue for the study of agency in transitions.

Similarly, this work on transition-oriented leadership potentially can provide more insight in existing theories and frameworks within transition studies. The example of transition management is striking in this regard. As has been discussed in Section 3.1.2, within transition management, the use of leadership has been applied implicitly, for instance through the creation of a vision in setting a transition agenda (Loorbach, 2007). Making the role of transition-oriented leadership explicit in such concepts may provide more insight in these frameworks and how they can be used to stimulate transitions.

My findings are, in part, in line with Grin et al. (2018), and show the importance of both collaborative and transformational leadership in transition-oriented projects. I found an important outcome of discussion in network meetings to be the creation of a shared vision (code T1, 'an actor creates a future vision for the system'), stimulated by discussion on how to overcome obstacles and high degrees of interaction between actors. Through the analysis, I also recognized an emphasis on inclusion of (new) relevant actors (code C1, 'an actor brings other actors together) and stimulation of voices of existing partners to both contribute to the discussion and assist in developing creative solutions to arising obstacles (codes C4 and T3 respectively, 'an actor ensures shared and equitable decision-making, and deals with issues of trust and legitimacy' and 'an actor stimulates other actors to come up with creative solutions towards a shared vision'). An actor exhibiting collaborative leadership often was found to direct the discussion towards the creation of a vision as a way to realize change (code C6, 'an actor steers the group towards the creation of a shared vision'). Multiple times, actors increased transparency in discussions by using their own strengths and positions to clarify discussion points (code C5, 'an actor ensures leadership and decision-making are transparent towards all actors'). When collaborative leadership was exhibited less, I found actors to be more prone to motivate other actors of their vision (code T4, 'an actor motivates other actors to get along with the own vision'). I found less evidence in the network meetings that a transformational leader would inspire actors to personal sacrifice, to make them more willing to comply with the project

(code T5, 'an actor inspires other actors to be more open to personal sacrifice in pursuing a shared vision') and no evidence transitional leaders create a context for knowledge gathering (code T6, 'an actor creates a context for knowledge gathering'). I suspect this to be the case due to all actors acting as leaders, through which a situation was created in which each actor shared equal power (code C7, 'an actor ensures power is shared between all actors').

An important finding, and moving past the work of Grin et al. (2018), is the importance of facilitators. I found participants to the network meetings in general were reluctant to exhibit collaborative leadership and more prone to exhibit both transformational and institutional leadership. In these meetings, facilitators naturally dealt with this by exhibiting collaborative leadership themselves. I further found evidence of additional activities of collaborative leadership being exhibited. At moments of confusion between actors, collaborative leaders helped negotiate these difficult points by creating clarity through actions like summarizing previous points (code C2, 'an actor helps negotiate the decision-making process'). Collaborative leaders further used their skills to align different visions expressed by transformational leaders into a single shared vision (code C8, 'an actor aligns different visions into a shared vision').
In conclusion, the findings of Grin et al. (2018) regarding leadership are in line with my findings. They fit in the transition-oriented leadership framework. This already was theorized in section 3.3, and is confirmed through analysis of network meetings and interviews.

In my work, I additionally prove the importance of institutional leadership in engaging in institutional work. In the network meetings, I recognized first steps of institutional work. While institutions were not yet changed in these meetings, it was discussed what needs to be changed and how to do this and with whom. Following the work of Elzen et al. (2012), I recognized discussion on regulative, normative, cognitive and economic institutions (codes I3-I6, 'the actor attempts to change regulative (I3), normative (I4), cognitive (I5), economic (I6) institutions'), often accompanied by discussion on the creation of new coalitions to accomplish this (code I1, an actor creates legitimacy by extending networks'). Grin et al. (2018) touched upon this subject in recognizing the creation and maintenance of institutions, upon which I build with the inclusion of institutional leadership as being a form of collaborative agency to engage in institutional work.

Based on discussion with our project partners, I additionally included personal leadership in the transition-oriented leadership concept. Before the project, I recognized in the Dutch agrifood system that many actors lack a personal vision and values upon which they base this vision. Through the interviews, I found this not necessarily to be the case in transition projects. At some point in their lives, they all had exhibited personal leadership and created a personal vision (code P1, 'an actor formulates a personal vision for the future'), which eventually led them to join the (transition-oriented) project as action towards meeting their own personal vision after they asked themselves how their vision would fit in their lives and what they can do towards meeting it (code P2, 'an actor questions how a future vision would factor in the life of the actor'). They knew their strengths (code P3, 'an actor discovers or capitalizes on their own strengths and capacities') and used these to exhibit approaches to leadership that utilize these strengths. I discovered the project partners did not exhibit personal leadership in the

project itself, or were not vocal about it. Through this, I confirm the notion of personal leadership to be a prerequisite to allow actors to exhibit other forms of leadership.

5.4 Reflection

The research conducted has a few limitations. The most striking limitation is the moderate validity of the study. The method used requires a form of coding that is prone to subjective interpretation. Therefore, in order to increase the validity of the results, a second coder is required. By using a second coder, the influence of the subjectivity of the first coder is minimized (Creswell, 2014), increasing validity. However, due to several restrictions in the work, with it being a master's thesis, the use of a second coder was limited. Parts of the analysis have been assessed by a second coder, PJ Beers, in terms of how well codes allocated reflect the leadership that is exhibited. Inter-rater reliability has not been calculated, meaning that the reliability of large parts of the analysis has not been determined.

As this results in moderate validity of the results, no hard conclusions can be drawn. However, what has been done is discussing observations through which further research can be directed at more specific questions.

Furthermore, through overlap in approaches to leadership, mistakes may have been made in the coding process, and as such in the analysis process. As already has been discussed to some extent in Section 4.2, some overlap exists between the four approaches to leadership. This makes sense, as leadership in general is about the creation of visions and actions in moving towards these visions. The four approaches to leadership highlight different points in this process. These overlaps have been dealt with by allocating all codes that apply to the segments.

Regarding actions in moving towards a vision, as an example, the type of action that has to be undertaken determines the approach to leadership that is exhibited. If the action is an institutional action or the creation of a coalition with the intention of an institutional change, the development of the action is coded as institutional leadership. Is the action of a nature that the existing network in the project has to be transformed in order to allow for the creation of a better vision, it is coded as collaborative leadership. And if the action is more practical in nature, it has been coded as transformational leadership. These actions are rather similar and differ mostly from one another by means of nuance. Therefore, it is possible that the coding of certain segments has been somewhat ambiguous at several points.

This study has been subject to two forms of bias influencing the results of the work. The first is related to the design of the study and is a form of conformation bias, whereas the second is related to the COVID-19 pandemic. In this study, I started with a synthesis, based on scientific literature, of approaches to leadership I deemed useful to execute relevant activities in sustainability transitions. The transition-oriented leadership framework and subsequent codebook were both based on this synthesis and has led to the focus of this study being only on this synthesis. Due to this design, in the analysis I only have searched for the four approaches to leadership described in the framework. Other approaches to leadership that may have been exhibited have been ignored.

Another source of bias with respect to the data is from a more recent phenomenon. Due to the COVID-19 pandemic, about half of the Transition Space project had to be executed in an online

57

environment. This means that all meetings have been conducted by means of tools like Microsoft Teams and Zoom. While it is not certain the shift from real life meetings towards virtual meetings has affected the data, this may indeed have happened. In the first months of the pandemic, multiple project partners discussed whether the network meetings, the most important output of the project, would be valuable to organise.

After the first network meeting was conducted, these concerns were laid to rest as the meetings still resulted in much useful data and many insights for the project partners. However, this does not mean that the acquired data would not have been different if these meetings would have occurred in real life. Due to the technological limitations of Zoom, only one person is allowed to speak at the time, hampering the natural flow of discussions to some degree. While this partially has been mitigated through the use of breakout rooms, it still might be the case that the meetings have been structured to a larger extent and that because of this, different data has been acquired.

6. Conclusions

By analysing a case study of a transition-oriented project in the Dutch agrifood system, this thesis has shown what the role of promising approaches to leadership in transition-oriented projects in the destabilization of regimes phase of sustainability transitions and how this leadership can be stimulated. Leadership, as a form of collaborative agency, can be exhibited by actors in order to execute six types of actions in transition-oriented projects. These types of actions are stimulating collaboration between different actors; formulating and aligning visions; adopting innovations; creating and transforming networks; engaging in institutional work; and convincing own organisations of change.

Four distinct approaches to leadership correspond to executing certain types of actions. Through exhibiting personal leadership, an actor can formulate a personal vision and discover their own strengths which they can utilize to move toward this vision. Exhibiting collaborative leadership can contribute in executing the types of action: 'stimulating collaboration between different actors,' 'aligning shared visions' and 'creating and transforming networks.' Exhibiting transformational leadership can contribute in executing the types of action: 'formulating a shared vision,' 'adopting innovations' and 'convincing own organisations of change.' Exhibiting institutional leadership can contribute actors in executing the type of action 'engaging in institutional work.'

Furthermore, leadership can be stimulated by inviting actors with the right strengths, capacities and positions. Based on these characteristics each actor is prone to exhibit certain approaches to leadership over others, with each actor prone to different approaches to leadership. As such, depending on which type of action is required, different actors can be invited with different strengths, capacities and positions. Leadership also can be stimulated by discouraging discussion about management and can be stimulated by fostering discussion on obstacles to overcome with the transition-oriented project.

These observations were made in a case study analysis on leadership exhibited in a transition-oriented project in the Dutch agrifood system. This approach was chosen as research on leadership in transitions has been sparse. As such, the intention of the research has been to be explorative with regards to leadership, to develop understanding of the role of leadership in the destabilization phase of sustainability transitions and to make observations regarding the stimulation of leadership in sustainability transitions. Because of this, the limitation of this study, being that validity is moderate, is not so much an issue.

Still, a number of conclusions may be drawn. First, regarding what types of actions in the destabilization phase of transitions could benefit from effective leadership, for which these six types of actions have been found. Second, regarding what approaches to leadership are promising in completing these six types of actions, for which the four approaches to leadership have been found. Third, regarding how the promising approaches to leadership are shown in transition-oriented projects, for which the transition-oriented leadership framework is developed and validated using the case study. And fourth, regarding how the promising approaches to leadership can be stimulated in transition-oriented projects, for which a number of processes have been observed. These are:

Observation 1:   Certain context circumstances, being avoidance of discussion on management and identification of obstacles to overcome, may contribute to stimulating project participants to exhibit leadership

Observation 2:   The strengths, capacities and position of an actor influence which approaches to leadership an actor exhibits in a transition-oriented project

Observation 3:   Facilitators and guiding questions have a vital role in stimulating leadership in transition-oriented projects

The results follow up on other research in the field of leadership. Other authors already have studied leadership in situations where multiple organisations come together in a project (Grin et al., 2018; Kramer et al., 2019; Craps et al., 2019). What is added to the existing literature is the notion of personal leadership as a prerequisite to allow actors to exhibit other forms of leadership; increased understanding of the use of collaborative and transformational leadership in transitions (Grin et al., 2018) the inclusion of the concept of institutional leadership as a form of collaborative agency to engage in institutional work; a number of activities being specified that can be undertaken through exhibiting various approaches to leadership; and three observations on how transition-oriented leadership is stimulated.

This is interesting for transition studies. Transition-oriented leadership can be used as a tool to stimulate the creation of a shared vision in transition projects. It can be used to identify and create new coalitions and it can contribute in helping actors discover what institutional work is required in the transition and how to do it. Transition-oriented leadership further can be used to foster collaboration between different organisations in these projects.

Outlook and further research

Through this study, a number of questions have come up that have not been answered yet. These questions provide avenues for further research. In this study, transition-oriented leadership has been studied within the confines of the destabilization phase of sustainability transitions, the transition space concept and a transition-oriented project in the Dutch agrifood system. Other phases of sustainability transitions and conceptual frameworks, like transition management, potentially could benefit from transition-oriented leadership as well, due to their emphasis on vision creation. The role of transition-oriented leadership within these confines provides one direction for further research.

Another direction for further research is the relation between personal vision, organisational vision and shared vision. In this study, it became evident that a discrepancy exists between the personal vision of an actor and the vision they share in transition projects that serves as input for the creation of the shared vision. Through the interviews, the suspicion was formed that this discrepancy has to do with the vision of the organisation the actor is part of, and that them being part of the organisation alters the vision they share in the transition project. Further research is necessary to gain more insight in the relation between these three visions.

A third direction for further research is related to the concepts of structure and agency. In transition studies, the focal point often is structure. This is no different in this thesis. The role of leadership in changing the system is studied. What has been studied less is how actors are influenced to show leadership. How can actors develop the strengths and capacities they need to exhibit the approaches to leadership necessary in transition projects?

References

Archer, D., & Cameron, A. (2013). *Collaborative leadership: Building relationships, handling conflict and sharing control*. London, United Kingdom: Routledge.

Adams, W.C. (2015). Conducting Semi-Structured Interviews. In Newcomer, K.E., Wholey, H.P., & Hatry, J.S. (Eds.), *Handbook of Practical Program Evaluation*. (Issue August 2015, pp. 492-505). Hoboken, NJ: Jossey-Bass. DOI: 10.1002/ 9781119171386.ch19.

Arthur, L., & Souza, A. (2020). All for one and one for all? Leadership approaches in complementary schools. *Educational Management Administration & Leadership*, 1-19. DOI: 10.1177/1741143220971285

Askeland, H. (2020). Institutional leadership: Maintaining and developing the 'good' organization. In H. Askeland, G. Espedal, B.J. Lovaas, S. Sirris (Eds.), *Understanding values work: Institutional perspectives in organizations and leadership.* (pp. 139-158). DOI: 10.1007/978-3-030-37748-9

Beers, P.J., & Loorbach, D. (2020, August). Transition governance amid destabilizing regimes: Operationalizing transition space. 11th International Sustainability Transition Conference, 18-21 August 2020, Vienna.

Béné, C., Oosterveer, P., Lamotte, L., Brouwer, I.D., de Haan, S., Prager, S.D., …, & Khoury, C.K. (2019). When food systems meet sustainability – Current narratives and implications for actions. *World Development, 113*, 116-130. DOI: 10.1016/j.worlddev.2018.08.011

Bennis, W.G., & Nanus, B. (2007). *Leaders: The strategies for taking charge* (2nd ed.). New York, NY: Harper & Row.

Binder, C.R., Mühlemeier, S., & Wyss, R. (2017). An indicator-based approach for analyzing the resilience of transitions for energy regions. Part I: Theoretical and conceptual considerations. *Energies, 10*(1), 36. DOI: 10.3390/en10010036

Bosman, R., Loorbach, D., Rotmans, J., & van Raak, R. (2018). Carbon lock-out: Leading the fossil port of Rotterdam into transition. *Sustainability, 10,* 2558. DOI: 10.3390/su10072558

Bourdieu, P. (1979). Distinction: A social critique of the judgement of taste.

Boyatzis, R.E., & Akrivou, K. (2006). The ideal self as the driver of intentional change. *Journal of management development, 25*(7), 624-264. DOI: 10.1108/02621710610678454

Brown, M.G. (1998). Improving your organization's vision. *The Journal for Quality and Participation, 21*(5), 18-21. Retrieved from https://search.proquest.com/scholarly-journals/improving-your-organizations-vision/docview/219177616/se-2?accountid=27128

Bui, S., Cardona, A., Lamine, C., & Cerf, M. (2016). Sustainability transitions: Insights on processes of niche-regime interaction and regime reconfiguration in agri-food systems. *Journal of Rural Studies, 48*, 92-103. DOI: 10.1016/j.jrurstud.2016.10.003

Covey, S.R. (1989). *The 7 habits of highly effective people*. New York: Simon & Schuster Inc. Retrieved from: http://dspace.vnbrims.org:13000/jspui/bitstream/123456789/1296/1/the-7-habits-ofhighly-effective-people.pdf

Craps, M., Vermeesch, I., Dewulf, A., Sips, K., Termeer, K., & Bouwen, R. (2019, February 1). A relational approach to leadership for multi-actor governance. *Administrative sciences, 9*(1), 12. DOI: 10.3390/admsci9010012

Crawford, M. (2012). Sola and Distributed Leadership: Definitions and Dilemmas. *Educational Management Administration & Leadership, 40*(5), 610-620. DOI: 10.1177/1741143212451175

Creswell, J.W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. (4th ed.). Los Angeles, CA: Sage publications

Darnhofer, I. (2015). Socio-technical transitions in farming: Key concepts. In L.-A. Sutherland, I. Darnhofer, G.A. Wilson, & L. Zagata (Eds.), *Transition pathways towards sustainability in European agriculture. Case studies from Europe* (pp. 17-31). DOI: 10.1079/9781780642192.0017

Da Silva, J.B. (2020). Institutional leadership: The historical case study of a religious organization. In H. Askeland, G. Espedal, B.J. Lovaas, S. Sirris (Eds.), *Understanding values work: Institutional perspectives in organizations and leadership*. (pp. 81-95). DOI: 10.1007/978-3-030-37748-9

Diaz, M., Darnhofer, I., Darrot, C., & Beuret, J-E. (2013). Green tides in Brittany: What can we learn about niche-regime interactions? *Environmental Innovation and Societal Transitions, 8*, 62-75. DOI: 10.1016/j.eist.2013.04.002

Elzen, B., van Mierlo, B., & Leeuwis, C. (2012). Anchoring of innovations: Assessing Dutch efforts to harvest energy from glasshouses. *Environmental Innovation and Societal Transitions, 5*, 1-18. DOI: 10.1016/j.eist.2012.10.006

Fischer, L-B., Newig, J. (2016). Importance of actors and agency in sustainability transitions: A systematic exploration of the literature. *Sustainability, 8*, 476. DOI: 10.3390/su8050476

Fuenfschilling, L., & Truffer, B. (2014). The structuration of socio-technical regimes – Conceptual foundations from institutional theory. *Research Policy, 43*(4), 772-791. DOI: 10.1016/j.respol.2013.10.010

Geels, F.W., Kern, F., Fuchs, G., Hinderer, N., Kungl, G., Mylan, J., …, & Wassermann, S. (2016). The enactment of socio-technical transition pathways: A reformulated typology and a comparative multi-level analysis of the German and UK low-carbon electricity transitions (1990-2014). *Research Policy, 45*, 896-913. DOI: 10.1016/j.respol.2016.01.015

Geels, F.W., & Schot, J. (2010). The dynamics of transitions: A socio-technical perspective. In J. Grin, J. Rotmans, J.W. Schot, D. Loorbach, F.W. Geels (Eds.), *Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative change*. (pp. 11-104). New York, NY: Routledge.

Geels, F.W., & Schot, J. (2007). Typology of sociotechnical transition pathways. *Research policy, 36*, 399-417. DOI: 10.1016/j.respol.2007.01.003

Grin, J., Hassink, J., Karadzic, V., & Moors, E.H.M. (2018). Transformative leadership and contextual change. *Sustainability, 10*(7), 2159. DOI: 10.3390/su10072159

Grin, J., Rotmans, J., Schot, J.W., Geels, F.W., & Loorbach, D. (Eds.) (2010). *Transitions to sustainable development: New directions in the study of long term transformative change*. United Kingdom, London: Routledge.

Ingram, J. (2015). Framing niche-regime linkage as adaptation: An analysis of learning and innovation networks for sustainable agriculture across Europe. *Journal of Rural Studies, 40*, 59-75. DOI: 10.1016/j.jrurstud.2015.06.003

Johansen, F., Loorbach, D., & Stoopendaal A. (2018). Exploring a transition in Dutch healthcare. *Journal of Health Organisation and Management, 32*(4). DOI: 10.1108/JHOM-07-2018-0185

Kanger, L., & Schot, J. (2016). User-made immobilities: A transitions perspective. *Mobilities, 11*(4), 598-613. DOI: 10.1080/17450101.2016.1211827

Kellis, D.S., & Ran, B. (2013). Modern leadership principles for public administration: Time to move forward. *Journal of Public Affairs, 13*(1), 130-141. DOI: 10.1002/pa.1453

Kivimaa, P., Hyysalo, S., Boon, W., Klerkx, L., Martiskainen, M., & Schot, J. (2019). Passing the baton: How intermediaries advance sustainability transitions in different

phases. *Environmental Innovation and Societal Transitions, 31*, 110-125. DOI: 10.1016/j.eist.2019.01.001

Köhler, J., Geels, F.W., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., …, & Wells, P. (2019). An agenda for sustainability transitions research: State of the art and future directions. *Environmental Innovation and Societal Transitions, 31*, 1-32. DOI: 10.1016/j.eist.2019.01.004

Köhler, J., de Haan, F., Holtz, G., Kubeczko, K., Moallemi, E., Papachristos, G., & Chappin, E. (2018, January 1). Modelling sustainability transitions: An assessment of approaches and challenges. *Journal of artificial societies and social simulation, 21*(1), 8. DOI: 10.18564/jasss.3629

Koistinen, K. (2019). Actors in sustainability transitions (Doctoral dissertation). Retrieved from https://lutpub.lut.fi/bitstream/handle/10024/159322/Katariina%20Koistinen%20A4.pdf?sequence=1&isAllowed=y

Kok, K.P.M., Loeber, A.M.C., & Grin, J. (2021). Politics of complexity: Conceptualizing agency, power and powering in the transitional dynamics of complex adaptive systems. *Research policy, 50*, 104183. DOI: 10.1016/j.respol.2020.104183

Kouzes, J.M., & Posner, B.Z. (2002). *The leadership challenge* (3rd ed.). San Francisco, CA: Jossey-Bass

Kouzes, J.M., & Posner, B.Z. (2017). *The leadership challenge: How to get extraordinary things done in organizations* (6th ed.). San Francisco, CA: Jossey-Bass.

Kraatz, M.S. (2009). Leadership as institutional work: A bridge to the other side. In T.B. Lawrence, R. Suddaby, & B. Leca (Eds.), *Institutional work: Actors and agency in institutional studies of organizations.* (pp. 59-91). Cambridge, United Kingdom: Cambridge University Press.

Kraatz, M.S., & Moore, J.H. (2002). Executive migration and institutional change. *The academy of management journal, 45*(1), 120-143. DOI: 10.2307/3069288

Kramer, M.W., Day, E.A., Nguyen, C., Hoelscher, C.S., & Cooper, O.D. (2019). Leadership in an interorganizational collaboration: A qualitative study of a statewide interagency taskforce. *Human relations, 72*(2), 397-419. DOI: 10.1177/0018726718763886

Lodder, M., Roorda, C., Loorbach, D., Spork, C. (2017). Staat van transitie: Patronen van opbouw en afbraak in vijf domeinen. Retrieved on 27-06-2021 from: https://drift.eur.nl/app/uploads/2017/09/DRIFT-Rapport-Staat-van-Transitie.pdf

Loorbach, D. (2007) Transition management: New mode of governance for sustainable development. (Doctoral dissertation). Retrieved from http://hdl.handle.net/1765/10200

Markard, J. (2018). The next phase of the energy transition and its implications for research and policy. *Nature Energy, 3*, 628-633. DOI: 10.1038/s41560-018-0171-7

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

Markle-Reid, M., Dykeman, C., Ploeg, J., Stradiotto, C.K., Andrews, A., Bonomo, S., …, & Salker, N. (2017). Collaborative leadership and the implementation of community-based fall prevention initiatives: A multiple case study of public health practice within community groups. *BMC Health Services Research, 17*. DOI: 10.1186/s12913-017-2089-3

Van Mierlo, B., & Beers, P.J. (2020). Understanding and governing learning in sustainability transitions: A review. *Environmental Innovation and Societal Transitions, 34*, 255-269. DOI: 10.1016/j.eist.2018.08.002

Miller, W.R., & Miller, J.P. (2007). Leadership styles for success in collaborative work. Paper presented at the Association of Leadership Educators 2007 Conference. Retrieved from http://www.localgovinstitute.org/library/collaborative-leadership/id/16

Northouse, P.G. (2019). *Leadership: Theory & practice.* London, United Kingdom: Sage.

Proka, A., Loorbach, D., & Hisschemöller, M. (2018). Leading from the niche: Insights from a strategic dialogue of renewable energy cooperatives in the Netherlands. *Sustainability, 10,* 4106. DOI: 10.3390/su10114106

Raelin, J. (2006). Does action learning promote collaborative leadership? *Academy of management learning and education, 5*(2), 152-168. DOI: 10.5465/AMLE.2006.21253780

Raelin, J.A. (2016). Imagine there are no leaders: Reframing leadership as collaborative agency. *Leadership, 12*(2), 131-158. DOI: 10.1177/1742715014558076

Raelin, J.A. (2018). What are you afraid of: Collective leadership and its learning implications. *Management Learning, 49*(1), 59-66. DOI: 10.1177/1350507617729974

Raven, R.P.J.M. (2006). Towards alternative trajectories? Reconfigurations in the Dutch electricity regime. *Research policy, 35*(4), 581-595. DOI: 10.1016/j.respol.2006.02.001

Rip, A., & Kemp, R. (1998). Technological change. In S. Rayner, & E.L. Malone (Eds.), *Human choice and climate change: Vol II, Resources and technology* (pp. 327-399). Columbus, OH: Battelle Press.

Rotmans, J., Kemp, R., & van Asselt, M. (2001). More evolution than revolution: Transition management in public policy. *Foresight, 3*(1), 15-31. DOI: 10.1108/14636680110803003

Rost, J.C. (1991). *Leadership for the Twenty-first Century.* Westport, CT: Praeger.

Runhaar, H., Fuenfschilling, L., van den Pol-Van Dasselaar, A., Moors, E.H.M., Temmink, R., & Hekkert, M. (2020). Endogenous regime change: Lessons from transition pathways in Dutch dairy farming. *Environmental Innovation and Societal Transitions, 36*, 137-150. DOI: 10.1016/j.eist.2020.06.001

Stogdill, R.M. (1974). *Handbook of Leadership: A survey of Theory and Research.* Free Press.

Sullivan, H., Williams, P., & Jeffares, S. (2012). Leadership for collaboration: Situated agency in practice. *Public management review, 14*(1), 41-66. DOI: 10.1080/14719037.2011.589617

Summerfield, M.R. (2014). Leadership: A simple definition. *American Journal of Health-System Pharmacy, 71*(3), 251-253. DOI: 10.2146/AJHP130435

Tittonell, P., Klerkx, L., Baudron, F., Félix, G.F., Ruggia, A., van Apeldoorn, D., …, & Rossing, W.A.H. (2016). Ecological intensification: Local innovation to address global challenges. In E. Lichtfouse (Ed.), *Sustainable agriculture reviews vol. 19* (pp. 1-34). DOI: 10.1007/978-3-319-26777-7_1

Turnheim, B., & Geels, F.W. (2012). Regime destabilization as the flipside of energy transitions: Lessons from the history of the British coal industry (1913-1997). *Energy policy, 50*, 35-49. DOI: 10.1016/j.enpol.2012.04.060

Washington, M., Boal, K.B., & Davis, J.N. (2008). Institutional leadership: Past, present, and future. In R. Greenwood, C. Oliver, R. Suddaby, & K. Sahlin-Andersson (Eds.), *Handbook of organization institutionalism* (pp. 721–736). Los Angeles, CA: Sage.

Appendices

Appendix A

The interview protocol was based on the semi-structured interview. The instructions for the interviewer were as follows:

1) Ask main question
2) Wait for the answer and listen carefully to what is said
3) Ask questions based on previous answer.
4) Repeat step 3 until there is no new information
5) Check the interview protocol for sub-questions that still need to be answered
6) If all sub-questions have been ask, move to the next main question
7) Do this for all questions

The interviews were conducted in Dutch. The guiding questions are denoted below:

Interview protocol

Eerst kort introductiegesprek. 5 tot 10 minuten over toestemming om op te nemen en te analyseren, volledig geanonimiseerd natuurlijk. Verder even kort ijs breken met gesprek over rol van de geïnterviewde bij het project, wat de geïnterviewde doet bij de organisatie en wat ik doe bij dit project.

1. Om te beginnen zou ik graag iets willen weten over jouw rol binnen het project en binnen jouw organisatie. Dus als eerste vraag: Wat is jouw rol binnen jouw organisatie?
   1.1. Wanneer we kijken naar jouw positie binnen de organisatie, zou je zeggen dat je eenzelfde gedachten hebt over de transitie naar een duurzame Agrifood sector dan de dominante gedachtegang binnen jouw organisatie? Zo ja, wat is deze gedachtegang? Zo nee, op wat voor manier verschil je met je organisatie?
   1.2. Waarom zit jij namens je organisatie aangesloten bij het ruimte voor transitie project?
   1.3. Waarom zit jouw organisatie aangesloten bij het project? In hoeverre resoneert dit met jouw persoonlijke redenen om bij dit project aangesloten te zitten?
2. De volgende set vragen is iets persoonlijker. Wanneer je ergens niet comfortabel mee bent om te beantwoorden is dat prima. Ik doe niets met de antwoorden zelf, in mijn analyse kijk ik naar andere dingen. Dus de volgende vraag: Wat is jouw persoonlijke visie voor jouw toekomst?
   2.1. In hoeverre is deze visie gerelateerd aan de Agrifood transitie?
   2.2. Kun je iets vertellen over hoe je tot deze visie gekomen bent? Bijvoorbeeld over wanneer deze geformuleerd is, of dit lang duurde et cetera.
   2.3. Welke onderliggende waarden hebben geleid tot jouw persoonlijke visie voor de toekomst? (Als voorbeeld kan ik wat van mijn eigen waarden geven zoals de vele problemen die ik zie op het platteland en in de voedingsindustrie en dat ik graag een toekomst voor mijn toekomstige kinderen wil en dat ik daarom zo gepassioneerd ben om een plaats te komen waar ik invloed kan uitoefenen voor de transitie)
   2.4. Wat zou je zeggen dat jouw sterke punten en capaciteiten zijn om jouw visie te bereiken?
   2.5. In welke mate heeft jouw visie ertoe geleid dat je nu bij het ruimte voor transitie project aangesloten zit?

2.6. Heeft jouw persoonlijke visie invloed op de mogelijke discrepantie tussen jouw gedachtegang en die van je organisatie?

3. De volgende vragen gaan meer over leiderschap binnen het ruimte voor transitie project. Kun je wat vertellen over het leiderschap wat je genomen hebt binnen het project?

3.1. Zitten er verschillen in het leiderschap wat je genomen hebt binnen de netwerkbijeenkomsten en de rest van het project? Zo ja, wat dan?

3.2. Wanneer je binnen het project zit, spreek je dan vanuit je eigen visie, de visie van de organisatie of een combinatie van beiden? Hoe uit zich dit?

3.3. Het leiderschap wat je toont, komt dit vanuit je sterke punten en capaciteiten? Zo ja, hoe uit dit zich?

4. De laatste vragen gaan over de terugkoppeling van het project naar de organisatie. Op welke manier beïnvloedt het werk in het ruimte voor transitie project de organisatie?

4.1. Hoe wordt het project binnen je organisatie besproken?

4.2. In hoeverre zorgen de gemeenschappelijke visies, concrete acties en andere zaken die in het project besproken zijn ervoor dat de visie en/of acties van de organisatie richting een Agrifood transitie daarin veranderen?

Wat is jouw rol hierin? Hoe zorg jij ervoor dat de uitkomsten van het project binnen de organisatie aan de orde komen en dus de visie van de organisatie veranderen?

Appendix B
In Section 2.4, the main codes from the codebook have been presented. Below, all codes, sub-codes included are presented.

Code label	Code description
Personal leadership	
P1	An actor formulates a personal vision for the future
P1.1	Through an insight of another actor, the actor changes their personal vision
P1.2	The actor's dreams, aspirations, values, and fantasies are articulated
P1.3	The actor discovers what is possible for the actor to set as personal vision
P1.4	The personal vision of an actor is influenced by their identity
P2	An actor questions how a future vision would factor in the life of the actor
P2.1	The actor discusses an obstacle they perceive in reaching their personal vision
P2.2	The actor discusses how they may fit into a proposed vision
P3	An actor discovers or capitalizes on their own strengths and capacities
P3.1	The actor denotes how they are positioned in the system to facilitate change
P3.2	The actor questions what strengths and capacities of them may be utilized to facilitate change
P4	An actor vocalizes their personal vision
P4.1	The actor shares their own personal values on which they have based their personal vision
P4.2	The actor shares their own personal vision
P4.3	The actor shows how personal values and the personal vision influence the life of the actor
P4.4	The actor shows what actions they undertake to reach their personal vision
Collaborative leadership	
C1	An actor brings other actors together
C1.1	The actor tries to include a new actor in the transition project
C1.2	The actor takes responsibility for diversity of the collaboration
C1.3	The actor emphasizes the lack of need of a certain actor in the transition project
C1.4	The actor emphasizes the need for a specific actor in the future
C1.5	The actor invited another actor for a future collaboration to move towards the shared vision
C2	An actor helps negotiate the decision-making process
C2.1	The actor negotiates a difficult point through constructive dialogue
C3	An actor handles conflict between actors in the group
C4	An actor ensures shared and equitable decision-making, and deals with issues of trust and legitimacy
C4.1	The actor ensures another actor provides input in the process, to make sure every actor contributes
C4.2	The actor questions the legitimacy of points in the discussion
C4.3	The actor legitimizes a discussion point
C5	An actor ensures leadership and decision-making are transparent towards all actors
C5.1	The actor creates or sustains an environment in which open discussion is stimulated and each leader is included

C5.2	The actor takes initiative to clarify something for the other actors with regard to a (shared) vision or other element of the creation of the vision, like obstacles and actions
C5.3	The actor stimulates another actor to increase transparency of their claims
C6	An actor steers the group towards the creation of a shared vision
C6.1	The actor brings up a new point of consideration for actors in their formulation of a shared vision
C6.2	The actor directs the discussion back to the creation of a shared vision
C6.3	The actor stimulates the group to create visions and solve problems
C6.4	The actor directs the collaboration to be aimed at some sort of change
C6.5	The actor asks another actor for their perspective of a shared vision which was created by a third actor
C7	An actor ensures power is shared between all actors
C8	An actor aligns different visions into a shared vision
Transformational leadership	
T1	An actor creates a future vision for the system
T1.1	The actor shares a clear future vision for the system
T1.2	The actor listens to the vision another actor shares and changes it based on personal vision
T1.3	The actor listens to the vision of another actor and shows this actor how to get to this vision
T1.4	The actor comes up with an action necessary to get to a shared vision
T1.5	The actor proposes a shared vision in which an innovation is adopted
T2	An actor builds trust between actors, by making their position clear and by standing by them
T2.1	The actor shares the values of the organisation the actor is part of
T2.2	The actor stimulates the collaboration between other actors as a means to act
T3	An actor stimulates other actors to come up with creative solutions towards a shared vision
T3.1	The actor actively asks other actors to share their thoughts on the question at hand
T4	An actor motivates other actors to get along with their own vision
T4.1	The actor convinces other actors to be on board with the vision they proposed
T5	An actor inspires other actors to be more open to personal sacrifice in pursuing a shared vision
T5.1	The actor provides an argument on how other actors will be worse off in the shared vision
T5.2	The actor shows another actor how their role will change negatively in the shared vision
T5.3	The actor provides a sense of mission to another actor
T6	An actor creates a context for knowledge gathering
Institutional leadership	
I1	An actor creates legitimacy by extending networks
I1.1	The actor attempts to build new coalitions with the explicit goal to facilitate institutional change
I2	The actor influences third parties to engage in institutional change
I3	The actor attempts to change regulative institutions
I4	The actor attempts to change normative institutions
I5	The actor attempts to change cognitive institutions
I6	The actor attempts to change economic institutions

I7	An actor creates internal consistency and support base for institutional change
I7.1	The actor engages in personal and/or transformational leadership
Other	
X1	An actor presents an obstacle to overcome
Y1	An actor discusses a new role for the own organisation in a new shared vision
Y2	An actor discusses a new role for another organisation in a new shared vision
Z1	A new insight from the transition project influences the personal leadership of an actor
Z2	An actor uses their personal leadership to exhibit different leadership in sustainability transition projects
Z3	An actor their personal vision stimulated them to be involved in a sustainability transition project

Table 4: The full codebook for transition-oriented leadership

Appendix C

The table below shows the full table, of which part was shown in Table 2 in Section 4.2. For instructions on how to read the table, see Section 4.2.

Breakout room	Frequency per code			
	Total frequency personal leadership	Total frequency collaborative leadership	Total frequency transformational leadership	Total frequency institutional leadership
Year 1.1 100 minutes	P1 = 0 C2 = 0 C7 = 0 P2 = 3 C3 = 0 C8 = 1 P3 = 13 C4 = 1 T1 = 12 P4 = 3 C5 = 0 T2 = 0 C1 = 1 C6 = 3 T3 = 1 **P = 19** **C = 6**		T4 = 2 T5 = 1 T6 = 0 I1 = 0 I2 = 0 **T = 16**	I3 = 0 I4 = 0 I5 = 0 I6 = 0 I7 = 0 **I = 0**
Year 1.2 100 minutes	P1 = 0 C2 = 0 C7 = 0 P2 = 4 C3 = 1 C8 = 3 P3 = 12 C4 = 3 T1 = 15 P4 = 4 C5 = 2 T2 = 0 C1 = 8 C6 = 6 T3 = 2 **P = 20** **C = 23**		T4 = 3 T5 = 0 T6 = 0 I1 = 2 I2 = 0 **T = 20**	I3 = 1 I4 = 0 I5 = 0 I6 = 0 I7 = 0 **I = 3**
Year 1.3 100 minutes	P1 = 0 C2 = 4 C7 = 0 P2 = 6 C3 = 4 C8 = 1 P3 = 12 C4 = 8 T1 = 19 P4 = 9 C5 = 2 T2 = 0 C1 = 6 C6 = 8 T3 = 0 **P = 27** **C = 33**		T4 = 4 T5 = 0 T6 = 0 I1 = 1 I2 = 0 **T = 23**	I3 = 2 I4 = 0 I5 = 0 I6 = 0 I7 = 0 **I = 3**
Year 1.4 100 minutes	P1 = 0 C2 = 0 C7 = 0 P2 = 1 C3 = 0 C8 = 0 P3 = 13 C4 = 7 T1 = 13 P4 = 3 C5 = 3 T2 = 1 C1 = 2 C6 = 8 T3 = 0 **P = 17** **C = 20**		T4 = 0 T5 = 1 T6 = 0 I1 = 0 I2 = 0 **T = 15**	I3 = 4 I4 = 0 I5 = 1 I6 = 0 I7 = 0 **I = 5**
Year 1.5 100 minutes	P1 = 0 C2 = 0 C7 = 0 P2 = 3 C3 = 0 C8 = 5 P3 = 13 C4 = 7 T1 = 18 P4 = 12 C5 = 1 T2 = 0 C1 = 2 C6 = 9 T3 = 1 **P = 28** **C = 24**		T4 = 2 T5 = 2 T6 = 0 I1 = 0 I2 = 0 **T = 23**	I3 = 3 I4 = 0 I5 = 1 I6 = 0 I7 = 0 **I = 4**
Year 2.1 80 minutes	P1 = 0 C2 = 3 C7 = 0 P2 = 0 C3 = 0 C8 = 3 P3 = 9 C4 = 3 T1 = 12 P4 = 4 C5 = 6 T2 = 0 C1 = 0 C6 = 1 T3 = 1 **P = 11** **C = 16**		T4 = 0 T5 = 0 T6 = 0 I1 = 0 I2 = 1 **T = 13**	I3 = 5 I4 = 1 I5 = 0 I6 = 4 I7 = 0 **I = 11**
Year 2.2 80 minutes	P1 = 1 C2 = 3 C7 = 0 P2 = 0 C3 = 1 C8 = 4 P3 = 6 C4 = 4 T1 = 13 P4 = 8 C5 = 1 T2 = 0		T4 = 0 T5 = 0 T6 = 0 I1 = 0	I3 = 0 I4 = 0 I5 = 2 I6 = 8

	C1 = 0 C6 = 3	T3 = 0	I2 = 0	I7 = 0
	P = 15	**C = 16**	**T = 13**	**I = 10**
Year 2.3 60 minutes	P1 = 0 C2 = 2 C7 = 0 P2 = 0 C3 = 0 C8 = 0 P3 = 10 C4 = 1 T1 = 11 P4 = 0 C5 = 0 T2 = 0 C1 = 2 C6 = 2 T3 = 1	T4 = 0 T5 = 0 T6 = 0 I1 = 9 I2 = 0	I3 = 3 I4 = 0 I5 = 6 I6 = 2 I7 = 0	
	P = 10	**C = 7**	**T = 12**	**I = 20**
Year 2.4 60 minutes	P1 = 0 C2 = 0 C7 = 0 P2 = 1 C3 = 0 C8 = 0 P3 = 9 C4 = 3 T1 = 8 P4 = 0 C5 = 3 T2 = 0 C1 = 3 C6 = 6 T3 = 6	T4 = 0 T5 = 0 T6 = 0 I1 = 6 I2 = 0	I3 = 0 I4 = 0 I5 = 1 I6 = 0 I7 = 0	
	P = 10	**C = 15**	**T = 14**	**I = 7**
Year 2.5 60 minutes	P1 = 0 C2 = 0 C7 = 0 P2 = 0 C3 = 0 C8 = 1 P3 = 7 C4 = 0 T1 = 6 P4 = 1 C5 = 6 T2 = 0 C1 = 3 C6 = 9 T3 = 2	T4 = 0 T5 = 0 T6 = 0 I1 = 0 I2 = 0	I3 = 2 I4 = 1 I5 = 2 I6 = 1 I7 = 0	
	P = 8	**C = 19**	**T = 8**	**I = 6**
Year 2.6 60 minutes	P1 = 0 C2 = 0 C7 = 0 P2 = 0 C3 = 0 C8 = 0 P3 = 6 C4 = 1 T1 = 9 P4 = 0 C5 = 5 T2 = 0 C1 = 0 C6 = 9 T3 = 1	T4 = 0 T5 = 0 T6 = 0 I1 = 3 I2 = 0	I3 = 3 I4 = 0 I5 = 2 I6 = 0 I7 = 0	
	P = 6	**C = 15**	**T = 10**	**I = 8**

Table 5: Complete frequency table main codes per breakout room

Appendix D

The table below shows the full table, of which part was shown in Table 3 in Section 4.2. For instructions on how to read the table, see Section 4.2.

Breakout room	Frequency table		
Year 1.1 100 minutes	X1 = 6 Y1 = 0	Y2 = 0 Z1 = 0	Z2 = 0 Z3 = 0
Year 1.2 100 minutes	X1 = 13 Y1 = 0	Y2 = 1 Z1 = 0	Z2 = 0 Z3 = 0
Year 1.3 100 minutes	X1 = 17 Y1 = 1	Y2 = 0 Z1 = 0	Z2 = 0 Z3 = 0
Year 1.4 100 minutes	X1 = 18 Y1 = 3	Y2 = 0 Z1 = 0	Z2 = 0 Z3 = 0
Year 1.5 100 minutes	X1 = 14 Y1 = 3	Y2 = 3 Z1 = 0	Z2 = 0 Z3 = 0
Year 2.1 80 minutes	X1 = 2 Y1 = 1	Y2 = 2 Z1 = 0	Z2 = 0 Z3 = 0
Year 2.2 80 minutes	X1 = 5 Y1 = 2	Y2 = 3 Z1 = 0	Z2 = 0 Z3 = 0
Year 2.3 60 minutes	X1 = 6 Y1 = 3	Y2 = 5 Z1 = 0	Z2 = 0 Z3 = 0
Year 2.4 60 minutes	X1 = 7 Y1 = 1	Y2 = 2 Z1 = 0	Z2 = 0 Z3 = 0
Year 2.5 60 minutes	X1 = 10 Y1 = 4	Y2 = 2 Z1 = 0	Z2 = 0 Z3 = 0
Year 2.6 60 minutes	X1 = 12 Y1 = 1	Y2 = 3 Z1 = 0	Z2 = 0 Z3 = 0

Table 6: Complete frequency table other codes per breakout room

Appendix E

The role of leadership in sustainability transitions – A case study of leadership in the Dutch agrifood system

Luc van Veghel[1,2], Myrthe Maurice – van Eijndhoven[2,*] and Pieter J. Beers [2,3]

[1] School of Innovation Sciences, Eindhoven University of Technology, Eindhoven, The Netherlands

[2] HAS University of Applied Sciences, Den Bosch, The Netherlands

[3] Dutch Research Institute for Transitions, Erasmus University Rotterdam, The Netherlands

Correspondence: beers@drift.eur.nl

1. Introduction

Sustainability transitions are radical change of societal systems into more sustainable systems, dealing with a number of sustainability related issues these systems have and which influence society. In order to stimulate and accelerate sustainability transitions, one should understand the key principles of these transitions.

Leadership is key to make transitions happen. We recognized it among new entrants that follow their dreams to develop innovative practices and among the incumbents that defect from dominant practices. We further recognized it across those actors that engage in institutional work (Fuenfschilling & Truffer, 2014) to make transitions happen (Grin et al., 2010). However, on a conceptual level, very few connections have been made between leadership literature and transitions, barring a rare example (Grin et al., 2018).

In this contribution, we build on the work of Grin et al. (2018) and their work on collaborative (relational) leadership, transformational (transformative) leadership and institutional work in transitions. We further explore the conceptual relations between leadership and sustainability transitions, and we report on an empirical study of leadership among primary producers and their wider societal networks in the Dutch agrifood system. We do this in a context of regime destabilization (Lodder et al., 2017). Therefore, the aim of this study is to understand the role of leadership in the destabilization of regimes phase in order to stimulate and further accelerate the sustainability transition in the Dutch agrifood system.

2. The concept of leadership in sustainability transitions

Leadership is a broadly studied concept with many definitions (Cf. Rost, 1991; Northouse, 2019). As discussed by Bennis et al. (2009), leadership, in general sense, can be seen as the capacity to create a vision and translate it into reality. We use a more specified definition as starting point which we call *social leadership*, due to the notion that transitions occur in social interactions (Grin et al., 2010). Social leadership is: "A process through which an individual influences a group of individuals to achieve a common [vision]" (Northouse, 2019, p.5). Leadership is distinct from other concepts, like management (Cf. Covey, 1989, p.87-89), power and coercion (Cf. Northouse, 2019, p.9 & p.11). While these concepts may touch upon similar elements, they have a different focus.

Leadership in sustainability transitions

We found no definition of leadership in sustainability transitions in literature, which is why we develop our own definition. We include the definition of social leadership as discussed above, as well as a definition of *personal leadership* due the importance of personal leadership being expressed in interviews with participants in the current project. Personal leadership involves actors defining a vision and actions towards it for their own life (Covey, 1989). With different actors collaborating in transition initiatives we argue no actor is assigned as leader, but leadership emerges within an actor through communication with other actors (Northouse, 2019).

Through social leadership, a *shared vision* is created, which in sustainability transitions often is a sustainable system. Through personal leadership, a *personal vision* is created, which is the vision an actor has for their own future and not necessarily has to comprise a sustainable system, although this once more often is the case in actors involved in sustainability transitions.

Within the field of transition studies, we can position leadership as a form of *collaborative agency* (Raelin, 2016). Raelin defines collaborative agency as actors coming together and interacting to coordinate their activities, potentially changing their own activities. He further defines leadership as a practice anyone can participate in. Leadership emerges as groups decide what to do, and how. Individual actors in collaborative settings (re)construct their positions and issues, and as such co-produce the structure and thus the system they operate in. This is a continuous process, as disturbances from or changes to the broader environment, being landscape, regime and/or niche, constantly force actors to adapt. Leadership through this notion focuses on building towards visions and maintaining them.

Kramer et al. (2019) show that actors coming together with a common goal employ various leadership theories to ensure the success of varying actions to be undertaken in the collaboration. These leadership theories illustrate different ways in which an individual can exhibit leadership. They focus on different actions an individual can undertake in creating and moving towards a vision. We refer to leadership theories as *approaches to leadership.* Sullivan et al. (2012) discuss agency as the freedom of actors to act within their structured context. As the structured context differs per actor, each actor exhibits different approaches to leadership as form of agency. They further identified a link between an actor's vision and the approaches to leadership they exhibit.

Based on collaborative agency, social leadership and personal leadership, we synthesize our own definition of leadership, called *transition-oriented leadership*:

> *"Leadership in sustainability transitions entails two interrelating forms of leadership. Individual actors exhibit personal leadership to develop a personal vision and a broad range of actions they can take towards it based on their strengths. They use this knowledge to exhibit social leadership in settings of collaborative agency to influence oneself and others to develop a shared vision and take action to move towards the shared vision with the intention to improve the current system through changing the structures of the system and adapting to these changes. Transition-oriented leadership entails the interrelated personal and social leadership as these two forms enable each other's development."*

As a boundary of our study we set the *destabilization* of regimes phase of sustainability transitions. Based on the X-curve of transitions model discussed in Lodder et al. (2017), we realize each phase of sustainability transitions has different actions that take priority that must be undertaken in moving forward in the transition. In processes of destabilization, incumbent actors start acknowledging increasing pressures on the regime and consequently start doubting

the viability of the regime (Raven, 2006). This is followed by efforts to change the regime through diversification and/or exploration of new options. As such, incumbent actors actively may try to engage in regime change to match the regime with the external pressures destabilizing it (Turnheim & Geels, 2012). The logic of incumbents in the previous discourse no longer holds up. Furthermore, policymakers can enact several functions to stimulate destabilization (Bosman et al., 2018).

Leadership has been discussed implicitly in transition studies. In transition management (Cf. Loorbach, 2007), a number of transition-based governance strategies have been developed that can be accomplished through different instruments. Two of these instruments are establishment of the transition arena and envisioning; and developing coalitions and transition agendas. Respectively, these instruments discuss the creation of a vision and the creation of actions towards a vision, both activities of leadership.

A second concept in which leadership has been discussed implicitly as well again in terms of vision and actions towards it is the *transition space*. Based on transition management, Beers and Loorbach (2020) created a new framework for sustainability transitions in the destabilization of regimes phase. A transition space is defined as a context in which various actors, both niche and regime, engage with one another and recognize each other's legitimacy as potential collaboration partner. Such a space opens up, they argue, when existing regimes start failing, but a new regime not yet has solidified. This may happen when actors share concerns about the sustainability of the regime. In this space, the niche-regime dichotomy from the multi-level perspective (Cf. Geels & Schot, 2007) no longer is present. Actors at both levels of structuration work together to change the regime. Niche actors may provide radical innovations and regime actors may provide incumbent power to influence the system.
Beers & Loorbach hypothesize that four different signs may indicate a transition space opening up: "incumbent actors actively voice sustainability concerns and the need for sustainability transitions; Innovative practices are embedded in new business models that enjoy growing niche markets; A public discussion exists about whether or not a sustainability transition is necessary; Various transition pathways are becoming rather well-known among those in favour of sustainability transition" (Beers & Loorbach, 2020, p.5).
In transition space, coalitions of actors are formed to enable institutional work (Fuenfschilling & Truffer, 2014). Experimentation is based on developing new institutional structures that strengthen innovative practices. The role of vision changes to one where the consequences of a transition pathway are envisioned for each actor individually. With the assumption built into this framework that innovative practices already have been developed, the transition space framework thus may help in making sense of the destabilization phase of sustainability transitions.

Following literature on sustainability transitions in general and more specifically on destabilization of regimes, we synthesized six types of actions an actor can undertake in this phase of sustainability transitions:

A. Collaborate with multiple other actors in sustainability transition projects: In sustainability transitions, multiple actors with varying backgrounds from varying societal levels come together and bring their own resources, capabilities, beliefs, visions et cetera to the transition effort. They interact to bring about a sustainability transition (Van Mierlo & Beers, 2020).
B. (Re)formulate and align visions, both individual and as collective: While most actors in both the regime and niches agree that the agrifood system is failing,

> both visions and priorities on what exactly is failing differ greatly among actors, even between different actors within the regime (Béné et al., 2019). To realize change, alignment of different visions is required (Bui et al., 2016).
>
> C. Adopt innovations: Through the development of innovations and their adoption through niche development or by regime transformation, a system can change.
> D. Create and/or transform networks: Networks change in changing systems. This might happen through expansion of the network, intensified contact/exchange between actors, increased interdependence, strengthening of a coalition (Elzen et al., 2012).
> E. Engage in institutional work: In order to change institutions of a system, an actor can engage in institutional work (Cf. Fuenfschilling & Truffer, 2014). Elzen et al. (2012) discuss a number of institutions that can be changed: cognitive, normative and economic institutions.
> F. Motivate the rest of the own organisation to be on board with change: As only one or a few individuals per organisation are part of a transition-oriented project, they have to motivate the rest of their organisation to be on board with the proposed actions in these projects.

As a tool to undertake these types of actions, actors can exhibit different approaches to leadership. To reiterate, different approaches to leadership focus on different activities an actor can undertake with respect to leadership, which still contribute to the general goal of leadership being the creation of vision and actions towards the vision.

For these six types of actions, we synthesized four approaches to leadership from leadership literature that can contribute to undertaking one or more of these types of actions: personal leadership, collaborative leadership, transformational and institutional leadership. The latter 3 are approaches to leadership that fall under social leadership. Each approach can be characterized by different activities. We used these activities in our analysis, which are codded according to the codebook in Table 1, see Section 3. For clarification reasons we refer to the codes in the text below.

In using ***personal leadership***, the individual attempts to create personal goals and a personal vision and align the activities the individual undertakes with this vision (Covey, 1989). For recognition of personal leadership we determined four main activities based on Covey (Table 1). P1: an individual determines their personal vision based on their image of a desired future, their perception of what is possible and their core identity (Boyatzis & Akrivou, 2006). P2: The individual combines universal laws and principles, structures and institutions of society, and compares these to their vision to determine what is possible. P3: The individual determines their talents, strengths and capacities to determine how they can contribute towards moving to their vision. P4: The individual vocalizes their personal vision to others.

The focus of ***collaborative leadership*** is collaboration between multiple actors. Each actor acts as a leader, leadership roles are emergent and actors can discuss and create new visions through collaboration. It is based on the idea that no single actor has all the answers, and only through collaboration with multiple leaders with different expertise and as such different valuable input a strong vision may be created (Kellis & Ran, 2013; Crawford, 2012). The performance of collaborative leadership is determined by activities that lead to and improve the collaboration between multiple actors which can be characterized by eight different activities used in our analysis (listed in Table 1).
C1: the leader identifies and brings together all relevant actors and takes responsibility for the required diversity in actors in the collaboration (e.g. Grin et al., 2018; Miller & Miller, 2007).

C2: the collaborative leader negotiates difficult points (Miller & Miller, 2007), meaning that difficult decisions and other aspects of a collaboration are dealt with through constructive dialogue (Raelin, 2018). C3: the collaborative leader handles conflict that arises in a collaboration, but also keeps other actors involved in the collaboration in periods of frustration and scepticism (Archer & Cameron, 2013; Miller & Miller, 2007). C4: a collaborative leader deals with issues of trust and legitimacy, through things like the provision of new arguments for another point and ensuring every actor is included and is allowed to speak in the collaboration (Grin et al., 2018; Raelin, 2006). C5: Collaborative leadership ensures an environment of transparency. Both leadership and decision-making are structured in such a way that every actor has the information and means to contribute (Miller & Miller, 2007; Grin et al., 2018). C6: The collaborative leader steers the actors towards the creation of new visions and solutions to problems, and as such the collaborative leader aims to use the collaboration to create change (Miller & Miller, 2007; Grin et al., 2018). C7: The collaborative leader ensures power is shared between all actors in a collaboration (Archer & Cameron, 2013; Raelin, 2006). C8: the collaborative leader aligns the different inputs, visions, ideas, et cetera of the different actors into new unique visions (Raelin, 2018).

The ***transformational leadership*** approach is based around a process where the leader engages with other actors and through this motivates and inspires other actors with respect to a vision (Northouse, 2019). A transformation leaders formulates a vision which is shared by other actors based on this engagement. As with collaborative leadership, several of the elements denoted in the various studies overlap. In our study we draw six main activities characterizing transformational leadership (listed in Table 1).
T1: Through interaction with others, be it followers or other leaders, the transformational leader creates a shared vision, based on their own vision and the vision of the other (Bennis & Nanus, 2007; Kouzes & Posner, 2002; 2017). T2: The transformational leader act in a predictable and reliable way and as such create trust (Bennis & Nanus, 2007) and use this trust to promote collaboration and enable others to act through allowing for this collaboration (Kouzes & Posner, 2002; 2017). T3: The transformational leader stimulates others to view problems from different angles and as such to find creative solutions (Grin et al., 2018) and stimulates development of innovative ways of dealing with issues (Northouse, 2019). T4: The transformational leader persuades others to get along with a particular vision and ambition (Grin et al., 2018). They motivate others to commit to the shared vision and as such motivate others to transcend their own self-interest (Northouse, 2019). T5: The transformational leader enjoys trust and respect (Grin et al., 2018), and uses this to provide a vision and a sense of mission to others (Northouse, 2019). T6: The transformational leader creates a context for knowledge gathering and act as coach and advisor (Grin et al., 2018; Northouse, 2019).

The ***institutional leadership*** approach is concerned with establishing and/or protecting institutions, being the structure of a certain environment (Askeland, 2020). From literature we synthesized seven relevant activities (I1-I7) we used in our analysis to recognize institutional leadership (Table 1). In literature we recognized three main steps characterize institutional leadership work.
An important first step for the institutional leader is to know their own vision. Therefore, the leader must use personal leadership to know exactly what goals the institutional change need to achieve (Washington et al., 2008; Kraatz & Moore, 2002). This shared vision is used by institutional leaders to connect the actors and to create internal consistency (I7).
A second activity of an institutional leader is to interact with a wide range of networks inside and outside the institution, as a form of network anchoring (I1) (Washington et al., 2008; Elzen et al., 2012). Through these interactions, the institutional leader attempts to create legitimacy

for the institutional change. Legitimization may occur through institutional anchoring, where regulative, normative, cognitive and economic institutions (I3-I6 respectively) are changed to be in line with both the shared vision and the socially constructed system of norms, values, beliefs and definitions (Elzen et al., 2012; Washington et al., 2008; Kraatz, 2009). This is done both by their own efforts and through influencing third actors (I2).

Third, institutional leaders ensure the coherence of the new institutions and maintain the new institutions after they have been developed. This involves actions like keeping the part of the population that legitimized the institutions from fragmenting (Washington et al., 2008; Kraatz, 2009).

We used the above six types of actions and four approaches to leadership to synthesize a transition-oriented leadership framework (Figure 1). We include personal leadership and social leadership, which includes three approaches to leadership.
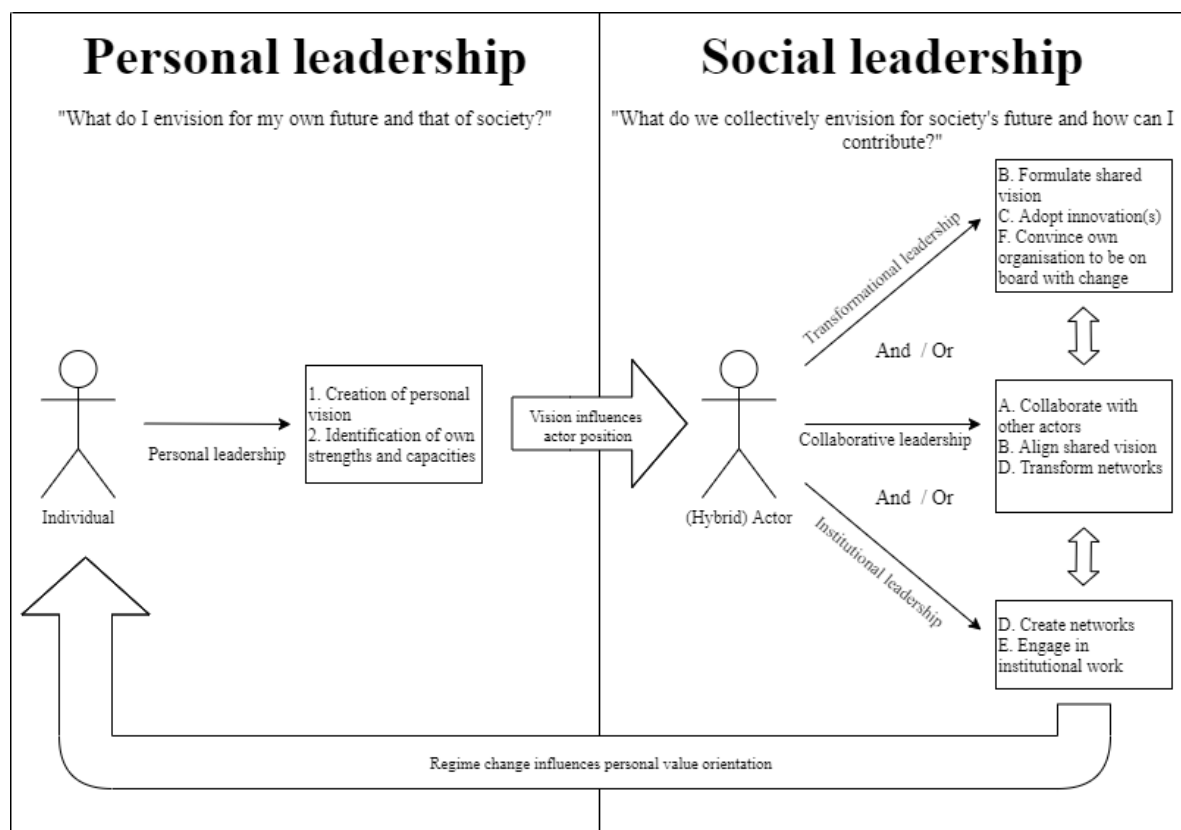

Figure 4: A transition-oriented leadership framework

Through personal leadership, an actor develops a personal vision and identifies their own strengths and capacities in order to reach this personal vision. The main driving question for the individual is what the individual envisions for their own future and for the future of society? This process of personal leadership may result in the actor seeking change in the system they are part of using different approaches to leadership which are part of the social leadership (at the right side of our transition-oriented leadership framework).

Prior to the exhibition of the approaches defined under social leadership, a first step generally is to determine the goal of the project, or more specifically what the group of actors collectively envisions for society's future and how the different actors can contribute towards this vision. Within such projects, based on their strengths, capacities and positioning, and the roles they take up within the projects, an actor may exhibit different approaches to leadership.

Through exhibiting transformational leadership, a shared vision can be formulated, the decision can be made to adopt certain innovations, and other parts of an actor's organisation can be convinced to be on board with the change proposed in the collaboration. Through exhibiting collaborative leadership, formulated visions can be aligned, new coalitions can be created or existing coalitions can be transformed, and actors can collaborate with other actors. Finally, through institutional leadership, activities can be undertaken to change institutions of a sector.

These three, transformational, institutional and institutional, approaches to leadership are highly interlinked. Institutional changes often are part of a vision, and as such, institutional leadership is related to the formulation of the shared vision and thus transformational leadership. The creation of a shared vision follows from the interaction between different actors, who discuss various elements of a system and their own visions in order to eventually align them into a shared vision, meaning that collaborative leadership is an integral part of transformational leadership. Furthermore, the creation of coalitions is part of institutional leadership as well as of collaborative leadership, meaning those two approaches to leadership relate as well.

Actors are not restricted to one approach to leadership. Based on their personal leadership and the roles they take on, an actor can use multiple approaches to leadership in one project. Finally, the leadership exhibited in a collaboration and the outcomes of the collaboration itself may affect an actor in a way that the actor will have to formulate a new personal vision by means of personal leadership.

3. Methods

Our current study has been a result of a collaboration between various partners in the Dutch agrifood sector, all well-known regime actors who actively work on opening up transition space. Together, we designed an empirical approach focusing on the development, understanding and gaps of personal, collaborative, transformational and institutional leadership in new transformation-oriented networks in the Dutch agrifood system. We used a multimethod empirical study including individual interviews and network meetings.

Data collection
Data collection took place through online meetings of transformation-oriented networks in the Dutch agrifood system which will further explained in this section. The network meetings were held in the years 2020 and 2021 and three additional interviews with partners in the project were held in 2021. Due to the COVID-19 pandemic, these network meetings were forced to be held online.
In the first year four network meetings were held revolving around entrepreneurs (seven in total) at the primary production level using both current and new partners (in total 13) in the food production chain. During the network meetings we focused on the value-orientated perception, agency, and obstacles to value-based action through a discussion based on the mental exercise of moving towards a specific future scenario. In total three previous designed future scenarios were used to shape the discussions: all-inclusive social farms, personalized food, and Deltastad NL circular agriculture (Beers et al. 2018). In sessions of about 3 hours, the participants of the network meetings would split up in breakout rooms. The entrepreneur would elaborate on their business, after which discussion between the participants was stimulated, directed at how the entrepreneur would fit into one of the future scenarios. The discussed topics were used to create an action agenda including several action lines that could be used, by the coalition of partners from the Dutch agrifood sector involved, to continue work on opening up and making use of the developed transition space.

In the second year these action lines were the basis of the four network meetings held focusing on the topics: improving earning capacity for Dutch farmers (2x), risk management, and the role and position of Dutch farmers in relation to a healthy food environment. For these action lines, the coalition partners took over lead. The network meetings of the second year were constructed similar to the first year network meetings, in which the direction of discussion was guided by use of guiding questions and facilitators. During the second series of meetings the focus was on discussing institutional changes in their potential for action perspective, and a basis was created of forming coalitions to make these changes happen.

Additional to the network meetings discussed above, three personal interviews were conducted. This additional data was collected because it became evident that several aspects of the transition-oriented leadership framework were not represented in the data from the meetings. The conducted interviews were semi-structured based on four question sets revolved around the following four topics 1) Actor positioning 2) Personal leadership 3) Leadership in the Transition Space project 4) Feedback between project and own organization.

Data analysis

All discussions, both network meetings and personal interviews, were recorded and listed back for an in depth analysis for recognition of the four synthesized approaches of leadership we used to build our transition-oriented framework explained in previous section. We conducted the analysis by assessing the data based on a codebook (Table 1) we derived from the literature on the four approaches to leadership we use (See Section 2 for an elaboration on where the codes originate from).

Table 7: Codebook for recognition of transition-oriented leadership

Code label	Code description
Personal leadership	
P1	An actor formulates a personal vision for the future
P2	An actor questions how a future vision would factor in the life of the actor
P3	An actor discovers or capitalizes on their own strengths and capacities
P4	An actor vocalizes their personal vision
Collaborative leadership	
C1	An actor brings other actors together
C2	An actor helps negotiate the decision-making process
C3	An actor handles conflict between actors in the group
C4	An actor ensures shared and equitable decision-making, and deals with issues of trust and legitimacy
C5	An actor ensures leadership and decision-making are transparent towards all actors
C6	An actor steers the group towards the creation of a shared vision
C7	An actor ensures power is shared between all actors
C8	An actor aligns different visions into a shared vision
Transformational leadership	
T1	An actor creates a future vision for the system
T2	An actor builds trust between actors, by making their position clear and by standing by them
T3	An actor stimulates other actors to come up with creative solutions towards a shared vision
T4	An actor motivates other actors to get along with their own vision

T5	An actor inspires other actors to be more open to personal sacrifice in pursuing a shared vision
T6	An actor creates a context for knowledge gathering
Institutional leadership	
I1	An actor creates legitimacy by extending networks
I2	The actor influences third parties to engage in institutional change
I3	The actor attempts to change regulative institutions
I4	The actor attempts to change normative institutions
I5	The actor attempts to change cognitive institutions
I6	The actor attempts to change economic institutions
I7	An actor creates internal consistency and support base for institutional change

4. Results

We analysed the network meetings in terms of leadership exhibited. For each segment of these meetings, we determined whether leadership was exhibited, and if so, what approach to leadership and which activities from this approach. In this section, we discuss two segments from the network meetings and show how leadership is exhibited in these segments. For the sake of presentation we translated these segments to English.

Network meeting segment 1

HAS teacher: What I recognize is several things coinciding. I see true cost accounting as being one level above that. What triggers me in [previous speaker's] story is the following: there is a difference between true price and true cost accounting. True pricing means placing a price on an externality, on an effect of production. True cost accounting on the other hand is more about transparency in the chain and providing insight in what is happening. This not necessarily means getting the price for the externality paid, you could also use the results of true cost accounting to create activities that can prevent these costs from being made. It is not only about paying for these costs. I think that is important context to share.

Facilitator: If I understand you correctly, all these institutional arrangements are some sort of true pricing, because they transform externalities into part of the price for a product?

HAS teacher: It may be the case for instance with an ecosystem service that has a certain cost, that the cost of this service is not the same as the price for the damage. [example to clarify this point]. It is not about ensuring the consumer pays for the costs, it is about creating transparency in the chain, and to use this as basis to develop other activities to mitigate these costs.

Facilitator: So it is a cost perspective to change chain activities? And not necessarily that the consumer sees this back in the price they pay?

HAS teacher: Not one on one indeed. If my cost is x, that does not mean the consumer pays x. This cost may be y, if we create an intervention which costs y somewhere in the chain that mitigates x.

Facilitator:	So true cost accounting is the logic based on which you would implement something like a meat tax. Meaning that true cost accounting is dissimilar to the other institutional arrangements.
HAS teacher:	Indeed.

This segment is taken from one of the network meetings, in which a number of actors came together to discuss five institutional arrangements. They were asked which arrangements they would prefer to be implemented and why. Based on these questions, discussion sparked. In the small discussion above, leadership is exhibited by the actors in a few ways. First of all, the HAS teacher recognized a misunderstanding about the way true cost accounting, one of the institutional arrangements, was understood. They took initiative, based on their own expertise from their position as teacher, to explain the concept in order to make sure every actor had the same information in decision-making. This is an example of the code 'Make sure both leadership and decision-making are transparent towards all actors (C5).' The knowledge this teacher has was derived from their position as teacher, for which they require certain knowledge and expertise. This is an example of this actor capitalizing on the code 'Discover own strengths and capacities (P3).' Near the end of the segment, the facilitator summarizes what they have heard and try to combine this new information on true cost accounting with the other institutional arrangements into a new configuration of actions. This is an example of the code 'A proposed shared vision is aligned with the vision of another actor (C8).'

Network meeting segment 2

Facilitator:	I'm curious about the ideas of the others. With whom can [livestock farmer] work together in the integrated production system both with inputs and outputs?
Member environmental organisation:	I still have trouble with the feed. While it is a goal of [livestock farmer] to minimize the use of feed, growing grain still costs space. You mentioned your father is involved with Kipster, they use waste streams from other sectors as feed. I'm curious what you think about that, as this seems the best model to me in this scenario. Furthermore I'm curious about the medicine you use. That has to do with animal health, but it also is related to emissions. I'm curious what you do with that and if it can be improved?
Livestock farmer:	I believe waste streams are something we could invest in. We will use these whenever we can, as this is part of minimal input. I agree with that aspect of Kipster, but you must look at the entire system. The chicken grows faster when fed grain produced for that purpose compared to feeding them waste products. Therefore, you have to calculate how much of the feed you can replace with waste streams. I want to replace as much as possible. So, I want to balance the environmental gains from replacing grain with waste streams and the additional environmental strain from the animals that grow at a slower pace.
Facilitator	[member animal protection agency], do you want to respond to this?
Member animal protection agency:	I was wondering if that doesn't provide opportunities. Perhaps you can opt to use other chicken breeds that thrive more on these waste streams? In such a scenario, they may still be less efficient, but that is not a problem as the feed no longer comes from specifically produced feed. This way, these fields no longer are used inefficiently.
Facilitator:	Good point. [ministry employee], what did you want to contribute?

Ministry employee:	We work a lot with arable farmers and when we discuss soil preservation, farmers mention they use break crops. They often produce grains with low yields, but that are useful in crop rotations to later produce profitable crops. Would a collaboration with such arable farmers be possible? That these farmers produce break crops you could use as feed, which simultaneously are beneficial for the soil of the arable farmers?
Livestock farmer:	Such a collaboration is possible. The problem is that I currently have a broker from which I buy my feed and who stands between me and the arable farmer, whom I would have to deal. We did arable farming ourselves for a while, but we quit this.

In this segment, the actors discussed ways in which the invited livestock farmer could change their farm with help of farm advisors and suppliers. This was based on one of the future scenarios previously created in the project and in which the farm of the livestock farmer would be placed.

The facilitator started off this segment with a question for all participants for which they sought a creative solution. This is an example of both codes 'Steer group towards creation of shared vision towards change of the regime (C6)' and 'Stimulate actors to come up with creative solutions to get to the shared vision (T3).' The member of the environmental organisation responded with an obstacle they perceive to be an issue for the farmer moving towards the scenario, being that feed still costs space to produce. They immediately discuss Kipster, an innovative niche project, to be a solution to overcome this obstacle (an example of T1, 'Create a shared vision').

Next, they come up with another obstacle that is not touched upon further in this segment. This shows a first instance in this segment in which someone comes up with an obstacle, which then is used as input for the creation of a vision. Similarly, both the member of the animal protection agency and the ministry employee share their vision on how to deal with the obstacle the member of the environmental agency discussed (T1 as a response to an obstacle discussed).

In the first contribution of the livestock farmer, they discuss the difficulty they perceive in becoming sustainable with their inputs. They weigh environmental benefits of using waste streams against environmental benefits of the chickens having a shorter time in which they grow. They further state that they make this decision consciously and imply with their first sentence in which they state they *could* start using waste streams that they currently prefer the environmental benefits of chickens having a shorter growing time. This is an example of the code 'An actor vocalizes their personal vision (P4).'

Interviews

We further conducted individual interviews with project partners to further discuss leadership they exhibit. From these interviews, we found amongst other things that all interviewed project partners at some point before them joining the project exhibited personal leadership in which they consciously created their personal vision based on which they eventually joined the project. One interviewee discussed "I spoke with an organisation providing leadership trainings, on value-oriented leadership, and that forced me to think about what I believe to be important in the world and what I myself want to do and to contribute. I started to think about what is important to me." (translated to English) (Code P1, 'Formulate a personal vision for the future'). Similarly, an interviewee discussed how their own strengths influence the way they believe they exhibit leadership. They stated "I have the ability to take a helicopter perspective and to use this to bring discussions and activities to the core of what is required. [...] If you take a helicopter perspective, you see what course of action has the most impact at

each moment" (Code P3, 'Discover own strengths and capacities'). They later stated to have used this strength to bring together a number of relevant actors together in the project: "I contributed a lot in the discussion on the approach we would take and which actors would be required for that. Which group composition would be necessary in allow interesting discussion with a broad range of inputs to get to the future scenarios" (Code C1, "Bring other actors together").

5. Discussion and Conclusion

In this work, we aimed to create understanding of the role of leadership in the destabilization of regimes phase, in an effort to use leadership as a way to stimulate and further accelerate sustainability transitions. We found that through transition-oriented leadership, as a form of collaborative agency, an actor is able to stimulate the creation of a shared vision in transition projects. It can be used to identify and create new coalitions and it can contribute in helping actors discover what institutional work is required in the transition and how to do it. Transition-oriented leadership further is a way to foster collaboration between different organisations in transition-oriented projects.

Our findings are, in part, in line with Grin et al. (2018), and show the important of both collaborative and transformational leadership in transition projects. We found an important outcome of discussion in network meetings to be the creation of a shared vision (T1), stimulated by discussion on how to overcome obstacles and high degrees of interaction between actors. We also recognized an emphasis on inclusion of (new) relevant actors (C1) and stimulation of voices of existing partners to both contribute to the discussion and assist in developing creative solutions to arising obstacles (C4 and T3). An actor exhibiting collaborative leadership often was found to direct the discussion towards the creation of a vision as a way to realize change (C6). Multiple times, actors increased transparency in discussions by using their own strengths and positions to clarify discussion points (C5). When collaborative leadership was exhibited less, we found actors to be more prone to motivate other actors of their vision (T4). We found less evidence in the network meetings that a transformational leader would inspire actors to personal sacrifice, to make them more willing to comply with the project (T5) and no evidence transitional leaders create a context for knowledge gathering (T6). We suspect this to be the case due to all actors acting as leaders, through which a situation was created in which each actor shared equal power (C7).

An important finding, and moving past the work of Grin et al. (2018), is the importance of facilitators. We found participants to the network meetings in general were reluctant to exhibit collaborative leadership and more prone to exhibit both transformational and institutional leadership. In these meetings, facilitators naturally dealt with this by exhibiting collaborative leadership themselves. We further found evidence of additional activities of collaborative leadership being exhibited. At moments of confusion between actors, collaborative leaders helped negotiate these difficult points by creating clarity through actions like summarizing previous points (C2). Collaborative leaders further used their skills to align different visions expressed by transformational leaders into a single shared vision (C8).

In our work, we additionally prove the importance of institutional leadership in engaging in institutional work. In the network meetings, we recognized first steps of institutional work. While institutions were not yet changed in these meetings, it was discussed what needs to be changed and how to do this and with whom. Following the work of Elzen et al. (2012), we recognized discussion on regulative, normative, cognitive and economic institutions (I3-I6), often accompanied by discussion on the creation of new coalitions to accomplish this (I1). Grin et al. (2018) touched upon this subject in recognizing the creation and maintenance of

institutions, upon which we build with the inclusion of institutional leadership as being a form of collaborative agency to engage in institutional work.

Based on discussion with our project partners, we additionally included personal leadership in the transition-oriented leadership concept. Before the project, we recognized in the Dutch agrifood system that many actors lack a personal vision and values upon which they base this vision. Through our interviews, we found this not necessarily to be the case in transition projects. At some point in their lives, they all had exhibited personal leadership and created a personal vision (P1), which eventually led them to join our (transition-oriented) project as action towards meeting their own personal vision after they asked themselves how their vision would fit in their lives and what they can do towards meeting it (P2). They knew their strengths (P3) and used these to exhibit approaches to leadership that utilize these strengths. We discovered our partners did not exhibit personal leadership in the project itself, or were not vocal about it.We confirm the notion of personal leadership to be a prerequisite to allow actors to exhibit other forms of leadership.

We consciously chose our focus in this study. We started this study with a synthesis, based on scientific literature, of approaches to leadership we deemed useful to execute relevant activities in sustainability transitions. The transition-oriented leadership framework and subsequent codebook both are based on this synthesis and has led to the focus of this study being only on this synthesis. Due to this design, in the analysis we only searched for the four approaches to leadership described in the framework. Other approaches to leadership that may have been exhibited have been ignored.

Based on our study, we further generated three hypotheses which are expected to be effective to opening up transition space and therewith to stimulate and further accelerate the sustainability transition in the Dutch agrifood system. The hypotheses are:

Hypothesis 1:   Certain context circumstances, being avoidance of discussion on management and identification of obstacles to overcome, may contribute to stimulating project participants to exhibit leadership

During the network meetings, a number of moments arose in which leadership was exhibited less frequent. When discussion shifted towards management of for instance the farm of a primary producer, actors were less prone to discuss a vision and actions towards the vision. Therefore, we hypothesize leadership can be stimulated by actively avoiding discussion on management. We further found:

Hypothesis 2:   The strengths, capacities and position of an actor influence which approaches to leadership an actor exhibits in a transition-oriented project, meaning only certain actors will stimulate leadership being exhibited

We found, based on personal leadership, that both the personal vision and the strengths and capacities of an actor determine if and how an actor will exhibit leadership in transition projects. As all approaches to leadership are of importance in transition projects, we hypothesize that, in order to stimulate leadership, actors need to be included whose strengths, capacities and position allow for them to exhibit leadership.

Hypothesis 3: Facilitators and guiding questions have a vital role in stimulating leadership in transition-oriented projects

As discussed above, we found collaborative leadership to be exhibited less naturally by project partners. We further found that guiding questions ensure the discussion remains focused on vision creation. As such, we hypothesize both facilitators, as leaders exhibiting collaborative leadership, and guiding questions can stimulate leadership.

The fact that we propose hypotheses instead of hard conclusions is due to limitations within the project design, partly due to COVID-19 restrictions. The main limitations contained the lack of a second coder to assess some parts of the analysis to minimize the subjectivity of the first coder and calculating an inter-rater reliability.

In conclusion, we developed a new form of collaborative agency, called transition-oriented leadership, through which actors in transition projects create shared visions, develop new networks/coalitions, engage in institutional work and collaborate with other actors. We hypothesize this approach to leadership can be stimulated through avoidance of discussion on management, stimulation of discussion on obstacles, the selection of the right actors with strengths, capacities and positions allowing them to exhibit certain approaches to leadership and by making active use of facilitators and guiding questions.

6. Acknowledgements