Overcoming Obstacles to Lund University's Sustainability Goals

A Case Study on the Use of Behavioral Insights in Canteen Settings

Mathieu Mal

Master Thesis Series in Environmental Studies and Sustainability Science,
No 2019:022

A thesis submitted in partial fulfillment of the requirements of Lund University International Master's Programme in Environmental Studies and Sustainability Science (30hp/credits)

LUCSUS
Lund University Centre for Sustainability Studies

LUND
UNIVERSITY

Overcoming Obstacles to Lund University's Sustainability Goals

A Case Study on the Use of Behavioral Insights in Canteen Settings

Mathieu Mal

A thesis submitted in partial fulfillment of the requirements of Lund University International Master's Programme in Environmental Studies and Sustainability Science

Submitted May 14, 2019

Supervisor: Kimberly Nicholas, LUCSUS, Lund University

This page is intentionally left blank.

Abstract

Universities are in a unique position to lead society through a sustainability transition. Still, there is an unexploited potential, even of low-effort, low-investment measures, for improving environmental sustainability at Lund University. This raises the question of what obstacles lead to suboptimal environmental management in universities. Through a literature review, I identified thirteen obstacles preventing the implementation of sustainable practices in university operations. I then organized these obstacles in a multi-level framework. By conducting key stakeholder interviews, I found that all of these obstacles are also present at Lund University. Nine of the obstacles (university governance, context dependence and lack of knowledge, resources, leadership, data, societal support, stakeholder engagement and communication) play an important role in the lack of measures aiming at reducing meat consumption in Lund University canteens. The limited resources of the environmental management appear to cause a narrowed focus on risk, legal compliance and safety hazards, excluding most operations from the scope of sustainability action, manifesting itself in, among other things, the absence of nudges in the canteen settings. Fortunately, several things can be done to improve this situation. First, more employees are needed to deal with environmental matters and to broaden the scope of action to enable taking action on all operations with environmental impacts. Second, there needs to be a systematized rather than ad hoc way in which experts can communicate findings with practical implications for sustainability to the relevant actors in the university management and operations. Third, in order to improve environmental performance, data on food consumption and other operations with an environmental impact at the university need to be collected and monitored systematically. Finally, nudges can be implemented with the purpose of reducing meat consumption at the university as a way of facilitating a behavior shift that contributes to more sustainable university operations.

Keywords: Organizational change, sustainable university, meat consumption, behavioral insights, nudging

Word count: 13 998

Acknowledgements

First and foremost, thank you Kim for your enthusiastic attitude, endless patience, warm support and pragmatic approach. You have been a wonderful supervisor throughout the entire process.

Thank you to the interviewees who were generous with their time and information.

Thank you Marie and Joren for taking the time to read my draft and sharing your comments.

Thank you Selja, Carlos, Asger, Paula and Henner for the thesis related advice and the unrelated distractions.

Danke, danku, धन्यवाद, धन्यवाद, go raibh maith agat, gracias, grazie, kiitos, köszönöm, merci, obrigado, tack, tak, takk, terima kasih, thank you, and 谢谢 Batch 21 for the two nice years we have spent together.

Table of Contents

1 Introduction 1

1.1 Consumption behavior and climate change 1

1.2 Universities and sustainability 2

1.3 Research aim and structure 3

1.4 Sustainability science 4

2 Nudging 5

2.1 Concept and ethics 5

2.2 Application for reducing meat consumption 7

3 Research design and methodology 9

3.1 Research design 9

3.2 Methodology 10

3.2.1 Literature review 10

3.2.2 Interviews 11

3.2.3 Direct observation 14

3.2.4 Evaluating alternatives: desirability, viability and achievability 15

4 Results 16

4.1 Obstacles to sustainability in university operations 16

4.1.1 The macro sphere 18

4.1.2 The meso sphere 20

4.1.3 The micro sphere *21*

4.2 Obstacles to sustainability in Lund University's operations **24**

4.2.1 The macro sphere *24*

4.2.2 The meso sphere *25*

4.2.3 The micro sphere *26*

4.3 Behavioral insights at Lund University canteens **31**

4.3.1 Availability *32*

4.3.2 Price *32*

4.3.3 Menu order *32*

4.3.4 Visibility *32*

5 Discussion **33**

5.1 The Cogwheel Framework **33**

5.1.1 Framework versus previous literature *33*

5.1.2 Framework versus reality *34*

5.2 Desirability, viability and achievability of nudging in Lund University canteens **36**

5.2.1 Desirability *36*

5.2.2 Viability *36*

5.2.3 Achievability *36*

5.3 Overcoming obstacles **37**

5.4 Limitations of the study **38**

5.5 Future research **39**

6 Conclusion **40**

7 References **41**

8 Appendices **45**

Appendix 1: Cited and original sources in literature review **45**

Appendix 2: Interview guides **46**

Appendix 3: Informed consent form for participants **49**

Appendix 4: Pictures of menus of canteens procured by Lund University **50**

Appendix 5: Comparison of obstacles in Leal Filho et al. (2017) and in this paper **52**

1 Introduction

1.1 Consumption behavior and climate change

There are physical limits to this planet that should not be transgressed in order to avoid large negative impacts on human wellbeing (IPCC, 2018; Jerneck et al., 2011). Contrary to the popular belief theorized by the 'Environmental Kuznets Curve', the data on greenhouse gas (GHG) emissions show that even countries that have achieved high welfare, still do not make the necessary efforts to follow a trajectory that stays within that sustainable and safe environmental space for humanity (Climate Action Tracker, 2018; Stern, 2004). Believing in technological development is not an easy answer to the complex problem of mitigating anthropogenic climate change (Adua, York, & Schuelke-Leech, 2016; Stern, 2004). In many affluent countries, including Sweden, national GHG emissions from a production perspective are relatively low and decreasing due to low carbon intensity of energy and low energy intensity of the Gross Domestic Product (Davis & Caldeira, 2010). However, on the often overlooked consumption-based emissions side, many rich countries are at the top of the emissions per capita list (Davis & Caldeira, 2010). This implies that waiting for all countries to become rich will not necessarily solve the issue of climate change. Further, waiting requires time, of which there is little: by 2030, GHG emissions need to be reduced by 45% compared to 2010 levels in order to limit global warming to 1.5°C above pre-industrial levels (IPCC, 2018).

People's consumption, choices and actions are at the basis of many environmental problems such as pollution and anthropogenic climate change (Mohammadalizadehkorde & Weaver, 2018; Omrcen, Dalbro, & Lundgren, 2017). Therefore, to understand the issue and create solutions, it is important to achieve a better understanding of behavioral psychology and economics. Although a lot of research is still ongoing, the field has brought forward many insights that are applicable to policy tools (Byerly et al., 2018). In particular nudging, which involves altering decision settings, has the potential to influence behavior and decisions. It has proven to be successful in achieving environmental goals by reducing people's energy and water consumption, reducing waste generation, improving recycling rates and influencing food choices (Byerly et al., 2018). Researchers have identified high-impact areas with currently high GHG emissions, where behavior change can substantially reduce emissions. Wynes, Nicholas, Zhao, & Donner (2018) identify meat consumption as one of the high-impact areas (meat production accounts for 14.5% of anthropogenic GHG emissions globally (Gerber et al., 2013)) in which interventions promoting pro-environmental behavior are necessary to meet the targets of the Paris Agreement.

1.2 Universities and sustainability

Universities are a key actor in society and are in an excellent position for driving a sustainability transition. They have a large potential and responsibility because of their wide and diverse scope when implementing sustainability in daily operations, research, curriculum and community (Adams, 2013; Evangelinos, Jones, & Panoriou, 2009; Francis & Moore, 2019; Leal Filho et al., 2017; Mohammadalizadehkorde & Weaver, 2018; Müller-Christ et al., 2014). This notion is not new and is reflected in (non-binding) documents that were created decades ago. Examples are the Stockholm Declaration of 1972 which recognizes the role of education in environmental protection and conservation and the Talloires Declaration of 1990 in which university leaders around the world committed to improving education, research, stakeholder involvement and collaboration on environmental topics (Mohammadalizadehkorde & Weaver, 2018). Because of increasing awareness of the environmental impact of their operations, many universities globally have started efforts to improve their sustainability outcomes (Alshuwaikhat & Abubakar, 2008; Francis & Moore, 2019; Larrán Jorge, Herrera Madueño, Calzado Cejas, & Andrades Peña, 2015). Despite universities being the center of knowledge and technology creation and the potential to make fast progress on the implementation of sustainability principles in their operations (Leal Filho et al., 2017), there is a multitude of elements obstructing this process which has resulted in slow change over the years (Larrán Jorge et al., 2015).

Society is calling for universities to take their responsibility to become more sustainable. Lund University is facing increasing pressure, both internal and external, to review the sustainability of its operations. A group of renowned academics urged universities to halve their GHG emissions over the next five years in an article published in Dagens Nyheter on the 28th of October 2018 ("Universiteten Måste Själva Börja Klimatomställningen", 2018). Following this article, also the students at Swedish universities, including in Lund, have started petitions to demand that universities drastically reduce their GHG emissions and improve their overall sustainability.

Lund University has drafted a long-term strategy and set up a short-term action plan with priorities to transform the university into a more sustainable institution. The foci of Lund University's environmental action plan 2017–2019 are: 'business trips by air', 'purchasing, procurement and supply chain', 'chemicals' and 'premises' (Lund University, 2017).

1.3 Research aim and structure

The aim of this paper is to identify and conceptualize the obstacles that universities, and Lund University in particular, face to implement policies that improve sustainability in their operations. A case study was carried out on the implementation - or lack thereof - of behavioral policies that can reduce meat consumption in university canteens and thus help the university achieve its ambition to become more sustainable.

I selected meat consumption in university canteens for the case study on behavioral insights based policy for four reasons. First, this area has been identified as a 'high-impact' area in scientific literature on GHG emissions (Wynes et al., 2018). Second, there is scientific literature on behavioral insights that offers measures that can be implemented in policy regarding meat consumption (Byerly et al., 2018; Kurz, 2017). Third, the environmental impact of food is a domain of sustainability that is relevant to the operations of the university given the large amount of food that is prepared by the canteens in Lund that are procured by the university. Fourth, procurements are one of the focus areas in the university's environmental action plan, but the challenge of reducing meat consumption is currently lacking concrete measures (Lund University, 2017).

The following research questions have guided the study:

RQ 1: What obstacles do universities face to implement changes for sustainability in their operations?
RQ 2: Can these obstacles be identified at Lund University and do they impede measures aiming to reduce meat consumption in the university canteens?
RQ 3: How is knowledge about behavioral insights for sustainability regarding meat consumption integrated in Lund University canteens?

Chapter 2 briefly covers the concept of nudging, the importance of meat consumption as a topic in sustainability and the relevance of nudging with regard to meat consumption. Chapter 3 comprises the research design and methodology followed in this paper. Chapter 4 is the results section which is divided in sections according to the research questions. In chapter 5, the discussion, theory and results are joined in order to assess nudging as a policy tool in the specific context of this research and to formulate recommendations for improving sustainability in the university's operations.

1.4 Sustainability science

Sustainability science is an interdisciplinary field characterized by methodological pluralism aimed at understanding the interactions between natural and social systems and how they affect the normative concept of sustainability (Kates, 2011; Spangenberg, 2011). Sustainability is commonly defined as "meeting the needs of present and future generations while reducing poverty and conserving the planet's life support systems" (Kates, 2011). Sustainability science is 'problem-driven' (Miller, 2013) or 'purpose-bound' (Spangenberg, 2011) and committed to providing the knowledge that is needed for societal decision-making (Miller, 2013), the means to plan and implement steps for moving knowledge into societal action (Kates, 2011) and "visions and scenarios indicating transition pathways towards global sustainability" (Spangenberg, 2011, p. 276).

This paper aligns with the nature and process of sustainability science research: starting from the global issue of environmental sustainability, recognizing the interplay between human behavior, human-made systems and the natural world, addressing the responsibility and potential of universities as drivers of sustainability and concluding with recommendations that enable the university to transition towards more sustainability.

2 Nudging

2.1 Concept and ethics

> A nudge … is any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives… [T]he intervention must be easy and cheap to avoid. Nudges are not mandates. Putting the fruit at eye level counts as a nudge. Banning junk food does not (Thaler & Sunstein, 2008, p. 6).

Behavioral psychology and economics have produced three insights that challenge classical economic theory (Carlsson & Johansson-Stenman, 2012). First, human decisions are not only influenced by material payoffs, but also by perceived fairness and social norms. Second, humans act in a social context, which leads to approval and status being motivators. Third, people have cognitive limitations which lead to seemingly irrational decisions. Rather than being utility maximizers with the perfect capacity of making rational economic decisions, people are subject to many fallacies and biases that lead them to make choices that are not necessarily in their best interest. Some examples of these biases are limited personal experience, complexity, passive choice and intertemporal choice making (Beshears, Choi, Laibson, & Madrian, 2008). To use the jargon of behavioral psychologists: nudging can help individuals towards the decision that our rational way of making well-considered choices (our reflective system 2) would take after getting rid of all possible biases. The reason we need help to take that decision is our automatic way of making choices without giving it a lot of thought (our intuitive system 1) that acts on many occasions (Kahneman, 2011).

Because of these factors that explain the incoherence and irrationality of people to determine what their best interest is, there is a mandate for policy makers to use their judgement to "internalize internalities" and help people to act in accordance with their own ultimate will and interest (Carlsson & Johansson-Stenman, 2012). In closing the gap between an individual's best interest and its actions also lies the potential for governments and public institutions to drive change. Government intervention in people's choices, however, has always been controversial. Especially when speaking about governments influencing people's behavior, thoughts of totalitarian dystopias might arise.

A view on the role of a government that can reconcile opposing views on appropriate degrees of government intervention is that of libertarian paternalism (Thaler & Sunstein, 2008). Libertarian paternalism follows behavioral economists in rejecting the assumption that people are the completely and always rational, well-informed, reflective decision-makers that they are assumed to be in classical economic theory. Libertarian paternalism allows institutions to influence people's lives for the better through interventions. Institutions then take up the role of 'choice architects' because they consciously design decision settings in order to influence outcomes. Libertarian paternalism remains a soft and limited version of government intervention since interventions have to preserve the individual's freedom of choice and should be non-intrusive and easy to avoid (Thaler & Sunstein, 2008).

When it comes to environmental issues, many governments have used command and control tools (Thaler & Sunstein, 2008). These kind of policies are often met with resistance and non-compliance because freedom of choice is not the guiding principle in their design (Kurz, 2017; Lehner, Mont, & Heiskanen, 2016; Thaler & Sunstein, 2008). Designing policies based on behavioral insights could help overcome this difficulty by creating less intrusive ways to reach similar goals. For example, evidence suggests that nudges based on social influence and adjustments to decision settings can influence pro-environmental behavior (Byerly et al., 2018; Thaler & Sunstein, 2008). Pollution is an externality that is practically invisible to most. On the other hand, the price of something with an environmental impact like gasoline, meat, etc. is salient, which makes it difficult to convince individuals to support a price increase (Thaler & Sunstein, 2008). Nudging towards environmentally friendly options can rectify this imbalance and lead to a decision that is closer to what an individual would do in the case of perfect information and free from other cognitive biases.

Despite the ethical considerations of libertarian paternalism and the promising experimental evidence with nudges, the potential of nudging as a policy tool is not supported by all. Multiple counterarguments are made concerning the undermining of democratic principles, transparency, manipulation, inequality and lack of demonstrated efficiency (Codagnone, Veltri, Lupiáñez-Villanueva, & Bogliacino, 2014; Lehner et al., 2016; Selinger & Whyte, 2012). Private companies, however, apply very similar techniques, usually called marketing. They are seldomly blamed for it although one could argue that the effect of their 'nudges' is in many cases a common bad for society. When asking the question of whether it would be ethical to introduce nudges to steer people's behavior in a certain way, it is important to understand that governments and institutions have influence (are choice architects) no matter what. And, if influencing an individual's decision-making is unavoidable, then why not influence for the good of people and the planet?

2.2 Application for reducing meat consumption

The livestock sector is a heavy user of natural resources, a large contributor to GHG emissions and a driver of biodiversity loss (Gerber et al., 2013; Hallström, Röös, & Börjesson, 2014; Machovina, Feeley, & Ripple, 2015). It faces difficulties decreasing its environmental impact while supplying an increasing demand for livestock products (a projected increase of over 70% between 2005 and 2050), driven by a rising population, increasing wealth and urbanization (Gerber et al., 2013). On a global scale, meat production is responsible for 14.5% of anthropogenic emissions (Gerber et al., 2013). In Sweden, one fourth of consumption based emissions comes from food and, of these emissions, a third is due to meat consumption (about eight percent of total consumption based emissions) (Kurz, 2017). Furthermore, the global trend of increasing meat consumption is also found at the Swedish level (Kurz, 2017). Hallström et al. (2014) show a beneficial synergy effect between public health, reduced land use pressure and GHG emissions induced by a reduction of 25% of meat intake which would align average Swedish meat intake with nutritional guidelines. According to Grabs (2015) who performed an analysis of Swedish consumption behavior, the effects of vegetarian diets on emission savings are often overestimated. Nonetheless, even a conservative estimation taking into account dietary replacement and rebound effects show that a vegetarian diet has a significant impact: a potential saving of 4.15% of a person's consumption based GHG in a year (or 20% reduction if only considering food) or 390 kg CO2-eq/person/year (Grabs, 2015).

Decisions related to food choices are susceptible to influence of changes in the decision-making setting (Kurz, 2017). Possible reasons are that many of the food related decisions are often part of a routine or habit, made in an unconscious way, with a focus on the present, and that the monetary stakes are relatively low (the cost of a typical meal does usually not induce deep reflection) (Kurz, 2017). Lehner et al. (2016) divide influential contextual factors into four categories: information, physical environment, defaults and social norms (other classifications exist, see for example Byerly et al. (2018)). This means that the way certain food is presented, packaged, information about other people's consumption, use of social norms, climate labeling or information about environmental effects, etc. can impact the decisions people make and thus potentially reduce meat consumption (Kurz, 2017; Lehner et al., 2016). This also means that there is a potential for intentional behavioral interventions in the choice architecture to achieve more sustainable food consumption.

Byerly et al. (2018) conducted a meta study including experiments on nudging for enhancing pro-environmental behavior. They find results showing a 50% increase in sales of vegetarian meals when they are made the default by moving the meat option to a separate menu (Campbell-arvai, Arvai, & Kalof, 2014). Another study included in this review showed a 15% decrease in reported meat consumption after commitments compared to a group that simply received information (no significant results for education) (Campbell-arvai, 2015). Remarkably, of the six environmental areas studied, meat consumption was the least studied with regard to nudging. This observation is supported by Kurz (2017) and Lehner et al. (2016) who report that within the field of behavioral interventions in food choices, the main focus has been on increasing the consumption of healthy foods rather than reducing meat consumption for environmental reasons. Nudges that are studied in other domains of sustainability, might also have effects when applied to the context of meat consumption. However, generalization of effects is a difficult topic given the context specificity of different settings and behavior, meaning that more research on the topic is necessary (Kurz, 2017; Lehner et al., 2016).

Kurz (2017) shows a significant effect of nudges on meat consumption in a three-month study at a canteen at the university of Gothenburg. During the experiment, the salience of the vegetarian option increased by moving it to the top of the menu and making the dish itself more visible. These actions resulted in a six percent point increase in sales of the vegetarian dish (14 to 20%) compared to the restaurant used as a control. After the original setting was reinstalled, the change dropped to a four percent point increase above the baseline, demonstrating a reduced but lasting effect. This reduction in meat consumption accounts for a reduction of 4.5% in the GHG emissions from food sales in the canteen. The lasting result suggests that the nudges made people experience the vegetarian dishes which made the dishes become part of the options they might potentially order.

3 Research design and methodology

3.1 Research design

This paper is an interpretive multimethod case study based on a literature review, interviews with key stakeholders and cross-sectional empirical data. The case study design is "well-suited for studying complex organizational processes that involve multiple participants and interacting sequences of events, such as organizational change" (Bhattacherjee, 2012, p. 94). A case study is contextualized and enables a deep understanding of the topic by allowing analysis of perspectives of multiple stakeholders and triangulation of their responses and other methods of data collection (Bhattacherjee, 2012). The study applied an interpretive approach since the interviews are not based on preliminary constructs (obstacles are not mentioned in the questions, but extracted from the responses afterwards), data collection and analysis take place simultaneously, subjective meaning of respondents is interpreted, and because of the use of theoretical sampling (Bhattacherjee, 2012). This inductive method is usually used for theory building (Bhattacherjee, 2012), in this case, however, its main use is theory testing: to test the framework deducted from literature while revealing the organizational obstacles present at Lund University. This is an approach borrowed from Soft Systems Methodology (SSM) which applies a qualitative approach to analyze interrelated components in organizations (Rotmans & Loorbach, 2009). SSM dictates the following steps: (1) formulating the problem, (2) conceptualizing a model, (3) comparing the model with the 'real world' and (4) designing feasible and desirable changes (Platt & Warwick, 1995). Figure 1 depicts the research design behind this paper and how the different methods relate to the research questions. The paper starts with the more general issues and narrows down to the more specific questions. In the following section each method and theory used is explained in more detail.

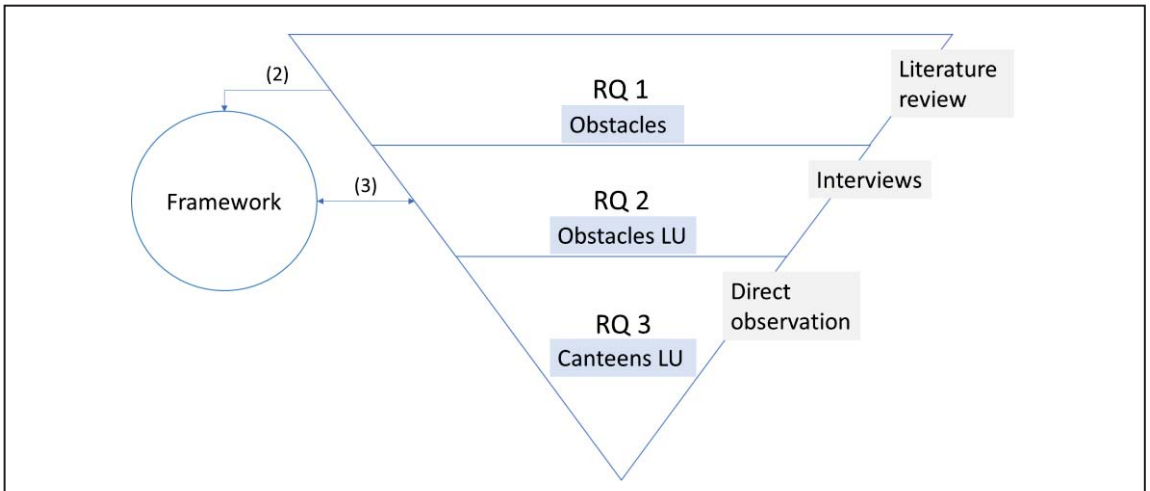


Figure 1. Schematic representation of the research design with the methods applied to each research question. (2) and (3) refer to SSM: conceptualizing the framework and comparing it to reality.

3.2 Methodology

3.2.1 Literature review

To identify obstacles that stand in the way of advancing sustainability in university operations (RQ1), I conducted a literature review and organized the obstacles in a framework.

3.2.1.1 Literature search

The literature search was performed in the database Scopus. The following inclusion criteria were applied: 1) published in English, 2) no earlier than 2010, 3) have 'universit*' and 'sustainab*' or 'green' in the title and 4) have 'obstacle' or 'opportunity' in either title, abstract or keywords.

I read all abstracts to assess whether the articles could contribute to answering the research question based on whether they contained any direct or indirect mention of an obstacle. Some of the articles included in the review identified obstacles through an empirical study while others presented secondary data based on other sources in literature. In both cases, this paper cites the article that was included in the literature search. Appendix 1 shows the original source(s) for each obstacle. The literature search resulted in 108 unique and accessible publications (Figure 2). About half (56) of these articles did not contribute to answering the research question, often because of a narrow focus on a technical issue or case which did not offer generalizable information to conceptualize obstacles to sustainability in university operations. About a third of the literature (38 papers) was focused on the topic of sustainability in the university curriculum, which falls outside the scope of this paper. Fourteen of the articles mentioned obstacles in an explicit or implicit way and were used to formulate the answer to the first research question.

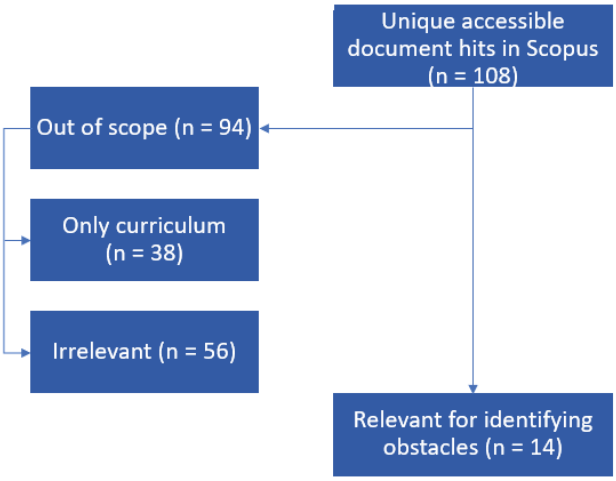


Figure 2. Diagram of scoping procedure to identify articles mentioning obstacles to sustainable university operations.

3.2.1.2 Building the framework

In transition management, institutional obstacles are an example of a locked-in flaw in our societal structure leading to a system failure (Rotmans & Loorbach, 2009). System failures give rise to 'persistent problems': complex and deeply embedded challenges with a multitude of actors that are difficult to manage, interpret and structure (Rotmans & Loorbach, 2009). Therefore, it is important to develop frameworks that can help identifying transition opportunities.

I divided the identified obstacles in three spheres: macro, meso and micro, to represent the spheres in which the obstacles manifest themselves. A multi-level perspective is an analytical lens through which mechanisms can be identified to then determine steps to influence them (Rotmans & Loorbach, 2009). The macro sphere refers to the societal context which impacts the operations of universities in many ways, but is outside of direct reach for the universities, such as the national economic model and political trends. The meso sphere is the sphere of the university's stakeholders who contribute to and rely on the university such as the students, academic staff, community and suppliers. The micro sphere is the most central sphere which comprises the university administration and is under direct control of the institution. This paper does not rank the identified obstacles since all of them are crucial and each of them can obstruct the implementation of sustainability (Leal Filho et al., 2017). Furthermore, Leal Filho et al. (2017) show that the frequency of the different obstacles mentioned by their respondents has a relatively limited range, indicating similar relevance. I have represented the interdependency between obstacles using a cogwheel pattern in the diagram (Figure 4a), depicting a machine of which the separate parts are integrated in one entity and thus have to be functional in order for the entire operation to run smoothly.

3.2.2 Interviews

To understand which obstacles could be hindering the implementation of sustainability at Lund University and how some of these might hinder the implementation of nudging in canteens to reduce meat consumption (RQ2), I conducted four semi-structured interviews with stakeholders. I then analyzed the answers to see to what extent they matched the literature-based framework. In semi-structured interviews an interview guide is designed beforehand which shapes the main structure of the interview. However, it allows a flexible interview process since there is a large degree of freedom for the respondent in answering the questions and to bring up other topics and for the interviewer to ask follow-up questions (Bryman, 2012). The interview guides are available in Appendix 2.

3.2.2.1 Sampling method

The sampling method I utilized for selecting interviewees is called generic purposive sampling, which is a category under theoretical sampling. This mode of sampling is purposive (not random) and based on a priori set criteria that are informed by the research questions (Bhattacherjee, 2012; Bryman, 2012). The inclusion criteria for determining relevant stakeholders were the following: individuals who 1) are in positions that can affect the sustainability policy at university canteens 2) represent different 'layers' of decision-making 3) offer diverse and complementary perspectives on sustainability and obstacles to shape a holistic view on the topic. This method led to the selection of the following interviewees: the Lund University Environmental Manager who is part of the university administration, two employees of the Lund University Sustainability Forum which is based at the faculty level and two canteen managers.

The Environmental Manager is, together with the Environmental Coordinator, in charge of the sustainability of university operations and informing the Vice-Chancellor about environmental topics.
The Sustainability Forum is an organization with the university-wide mission to foster exchanges between researchers, students and society on sustainability issues through communication and support networks. Although the formal mission of the Sustainability Forum does not include university operations, these are still relevant issues to them due to their role of supporting the Environmental Manager and student initiatives that might address these topics.
The canteen managers and their companies are not part of the university structure but have procurement contracts from the university to deliver their services. As shown in Table 1, out of the 15 canteens procured by LU, two companies own and manage three canteens each and one company owns and manages two of the canteens. This means that three companies are in charge of eight out of fifteen canteens. These three companies were contacted for interviews. Two were eventually interviewed while the third one was unresponsive.
Also LU Estates was contacted for an interview since this department makes the procurements with the canteens, but they were unwilling to arrange an interview.

Table 1. Overview of the canteens procured by Lund University. List retrieved from the Staff Pages on the Lund University website, last access on 8/05/2019.

Name	Company	Location
1. Bryggan Kök & Café	Mötesplats CRC AB	Lund
2. Café Botan	Patisseriet	Lund
3. Café Eden	N/A	Lund
4. Café Hjärtat	SM CAFÉ & CATERING AB	Lund
5. Café Holger	Cornelius HB	Lund
6. Café Juridicum	ISS	Lund
7. Café LUX	Åma AB	Lund
8. Café UB	Hekajo AB	Lund
9. Ester Mat & Café	Mötesplats CRC AB	Lund
10. Mor & Dotters Skafferi	Mor & Dotters Skafferi AB	Malmö
11. Moroten & piskan	Åma AB	Lund
12. Mötesplats CRC	Mötesplats CRC AB	Malmö
13. På Skissernas	På Skissernas I Lund AB	Lund
14. Restaurang SOL	Hekajo AB	Lund
15. Stamstället	Åma AB	Lund

3.2.2.2 Analysis

The analysis of the responses is best described by the method of selective coding in which "new data is selectively sampled to validate the central category and its relationships to other categories (i.e., the tentative theory)" with an element of open coding "other categories may emerge from the new data that may be related to the phenomenon of interest" (Bhattacherjee, 2012, p. 115). However, open and selective coding are concepts from Grounded Theory which requires the researcher to study the data without externally preconceived classification systems (Bhattacherjee, 2012). This does not apply to this study since the categories are based on the earlier literature review.

3.2.2.3 Ethical considerations

Before the start of every interview, each interviewee was presented and asked to sign the informed consent form. At this point, the topic and aim of the research were explained again (a description was already provided when contacting the potential interviewees). Two of the interviewees refused being audio recorded for transcription and the recording device malfunctioned in one of the interviews. One interviewee did not wish to sign the informed consent form, but agreed verbally to all the information from the interview being used for the purpose of this research. Direct quotes that are attributed to a specific interviewee have been checked and approved by the concerned interviewees. The informed consent form for participants is available in Appendix 3.

3.2.3 Direct observation

The current scientific knowledge about the potential of nudging to reduce meat consumption sparked the question of how this knowledge is being applied in the canteens at Lund University (RQ3). The thirteen canteens located in Lund (Figure 3) were visited in person (pictures of the menus in Appendix 4) and checked on availability of a vegetarian option, the price of the vegetarian option relative to other dishes, and their implementation of the recommended interventions in Kurz (2017): vegetarian option first on menu and visibility of vegetarian option. The variables were coded as follows: 'Veg available' is 'Yes' if there is at least one vegetarian option among the sandwiches, salads or warm meals. 'Veg cheaper' is 'Yes' if the vegetarian option is cheaper than the equivalent containing meat. 'Veg visible' is 'Yes' if the vegetarian option is more visible than the other options in the physical environment. 'Veg first' is 'Yes' if the vegetarian option is on top of the menu.

The data is cross-sectional because the collection took place 1) at one point in time 2) in multiple units 3) in a standardized way (checklist) which allows for comparison between units (Bryman, 2012).

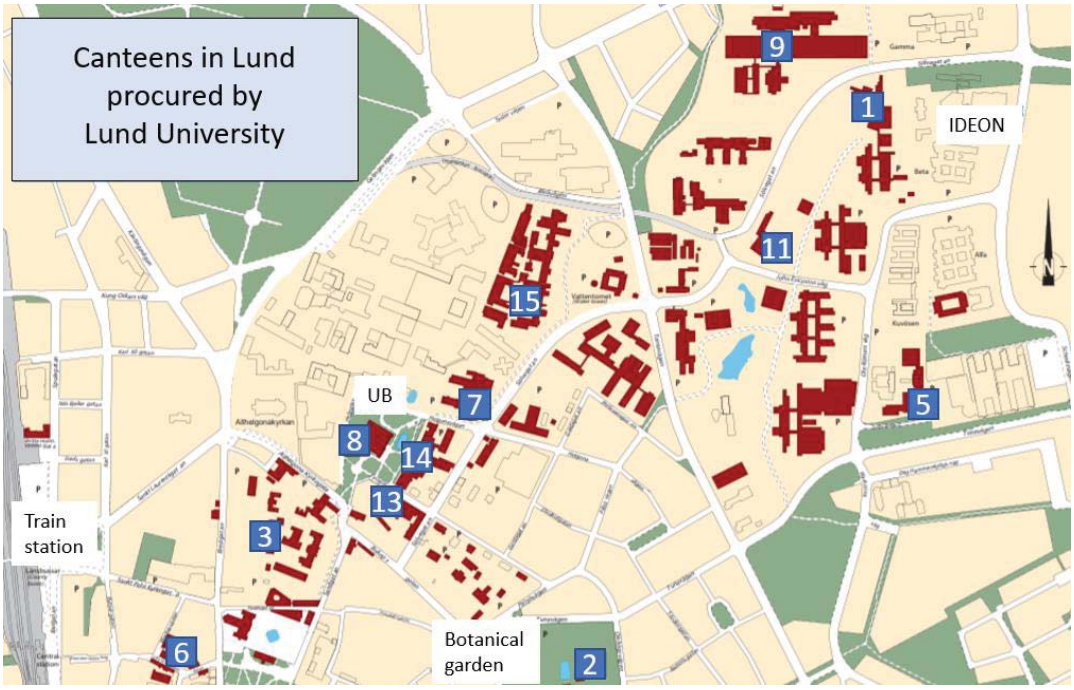


Figure 3. Map showing the location of the 13 canteens in Lund. Numbers correspond with those in Table 1. Image adapted from the Staff Pages on the Lund University website, last access on 8/05/2019.

3.2.4 Evaluating alternatives: desirability, viability and achievability

Section 5.2 in the discussion is structured according to concepts from the framework for Emancipatory Social Science by Erik Olin Wright. Wright (2010) poses that alternatives to current institutions and structures can be evaluated using three criteria: desirability, viability and achievability. "these [criteria] are nested in a kind of hierarchy: not all desirable alternatives are viable, and not all viable alternatives are achievable" (Wright, 2010, p. 14).

The first question to be asked is whether a given alternative is desirable, without considering the risk of formulating utopian or unrealistic views. It is a normative and important first step because it gives a sense of the subject's values and strengthens commitment to change.

Without considering contextual factors or practical implications, however, change is unlikely to happen. Therefore, the second question is whether the alternative is viable in the particular context in which it is proposed. The matter of viability is whether an alternative, when implemented, will actually foster the desired change in a sustainable way or whether unintended consequences will ruin it. Defining viable alternatives is important even if they are not practically achievable right now, since they might become achievable under future conditions. Moreover, "the actual limits of what is achievable depend in part on the beliefs people hold about what sorts of alternatives are viable" (Wright, 2010, p. 15).

The final question of whether the desired alternative is also practically achievable under current conditions depends on two factors: strategy and power.

> Strategy matters because emancipatory alternatives are very unlikely to just "happen"; they can only come about because people work to implement them, and are able to overcome various obstacles and forms of opposition. The probability of ultimate success, then, depends upon the balance of power of contending social forces consciously attempting to implement and resist emancipatory transformation. (Wright, 2010, pp. 16–17)

4 Results

4.1 Obstacles to sustainability in university operations

The literature review resulted in the identification of thirteen obstacles to sustainability in the operations of universities. The obstacles are organized in the Cogwheel Framework (Figure 4a) and explained briefly (Figure 4b) before being discussed in depth in the following sections. Table 2 shows which papers identified which obstacles.

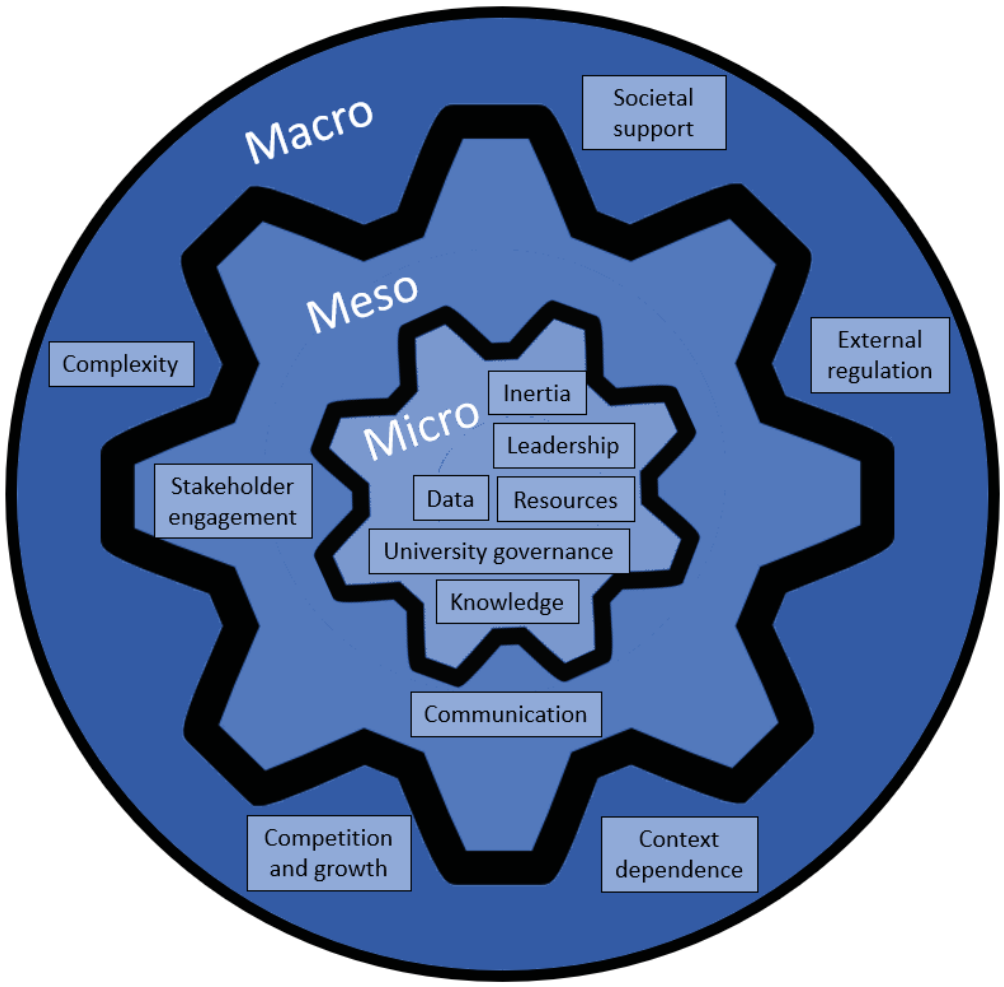


Figure 4a. Cogwheel Framework depicting the obstacles for universities to implement sustainability in their operations at the macro, meso and micro sphere identified through the literature review.

The macro sphere	
Competition and growth	Increasing pressure due to growing numbers, expectations and neo-liberalization
Complexity	Multidimensional issues, many definitions of sustainability, lack of consensus for operationalization
Context dependence	There is no "one fits all" approach to sustainability in university operations
External regulation	Government regulations hindering sustainability in university operations
Societal support	Negative or indifferent government attitude and public opinion towards sustainability
The meso sphere	
Communication	Lack of communication about sustainability related issues and measures
Stakeholder engagement	Lack of inclusion of relevant actors in sustainability efforts at the university
The micro sphere	
Data	Limitations in data, access to data, monitoring and reporting
Inertia	The attachment to business as usual practices, reluctance to change
Knowledge	Lack of knowledge about sustainability and the 'why' and 'how' of implementing it in university operations
Leadership	Lack of commitment, agenda, focus and decisions concerning sustainability
Resources	Limitations of budget and staff
University governance	Lack of enforcement, bureaucratic decision making, 'silo structure', lack of designated responsibility and accountability

Figure 4b. Brief explanation of the obstacles depicted in the Cogwheel Framework.

Table 2. Overview of the papers from the literature review and the obstacles they identified.

	Macro					Meso		Micro					
	Competition and growth	Complexity	Context dependence	External regulation	Societal support	Communication	Stakeholder engagement	Data	Inertia	Knowledge	Leadership	Resources	University governance
Francis & Moore, 2019	x		x	x									
Srikun, 2018							x	x					
Mohammadalizadehkorde & Weaver, 2018	x	x			x							x	x
Fedorov et al., 2018			x	x	x		x	x				x	
Perrault & Clark, 2017		x				x				.			
Filho et al., 2017		x	x	x		x	x		x	x	x	x	x
Sammalisto et al., 2015		x									x	x	
Dagiliūtė & Liobikienė, 2015				x		x	x	x		x	x		x
Larrán Jorge et al., 2015				x	x	x	x		x		x	x	
Ramos et al., 2015											x		x
Butt et al., 2014		x			x	x	x	x			x		
Salter et al., 2013		x					x		x			x	x
Finlay & Massey, 2012					x		x		x	x		x	x
Omrcen et al., 2018				x									

4.1.1 The macro sphere

4.1.1.1 Competition and growth

Globally, university campus facilities face increasing pressure due to growing student numbers and increasing academic expectations of students, staff, governments, industry and taxpayers (Francis & Moore, 2019). In the Australian context, Francis & Moore (2019) also note a trend towards increased financial accountability and ongoing neo-liberalization of higher education. Mohammadalizadehkorde & Weaver (2018) juxtapose the notion of sustainability which has raised questions concerning growth models and university plans that seem to advocate for growing and expanding institutions, be it in a less environmentally harmful way.

Some researchers see an opportunity for the implementation of sustainability initiatives in this competitive context. Since universities are not immune from market pressures, being sustainable can lead to a competitive advantage in a market where stakeholders such as students, staff, industries and governments value environmental performance (Butt, More, & Avery, 2014; Larrán Jorge et al., 2015; Salter, Murray, Davison, Fallon, & Towle, 2013). This could drive universities to keep up with levels of sustainable engagement at other universities (Dagiliute & Liobikiene, 2015). From this point of view, efforts in sustainability can result in a better reputation, ranking, more access to research funding and commercialization (Butt et al., 2014).

4.1.1.2 Complexity

Sustainability issues are multidimensional and complex and there is a large number of definitions and conceptualizations of 'sustainability' in academic literature (Perrault & Clark, 2017; Salter et al., 2013). The lack of consensus on an operational definition for sustainability undermines the understanding of the concept and forms a barrier for implementation (Leal Filho et al., 2017; Perrault & Clark, 2017; Salter et al., 2013; Sammalisto, Sundström, & Holm, 2015). Perrault & Clark (2017) also show that in spite of large efforts and investments, students' understanding of sustainability has not improved over time, which they claim is due to the complexity and ambiguity of the concept. Even when universities recognize and portray this complexity in their vision, their sustainability implementation plans tend to include simple strategies and small-scale solutions that do not address the complexity (Mohammadalizadehkorde & Weaver, 2018).

4.1.1.3 Context dependence

There is no "one fits all" approach to sustainability for universities (Francis & Moore, 2019; Leal Filho et al., 2017). Therefore every case requires analysis of the applicability of a certain measure or policy based on the university's future needs and most appropriate pathways (Francis & Moore, 2019; Leal Filho et al., 2017). This view is supported by Fedorov, Zakablukovskiy & Galushkina (2018) who give the example of university campuses in Russia for which geographic and climatic factors are a main obstacle for the implementation of resource-saving technologies such as solar panels or wind power plants.

4.1.1.4 External regulation

It is important that a university's strategy and plan are supported by the local, regional or national policy (Dagiliute & Liobikiene, 2015; Leal Filho et al., 2017). Government regulations can both stimulate and hinder the implementation of sustainable practices on campus. New building standards have for example improved energy efficiency (Francis & Moore, 2019), while buildings being classified as cultural heritage impede the adoption of more energy efficient infrastructure (Fedorov et al., 2018). An example in the Swedish context is the legislation that does not allow universities to own real estate. Universities therefore sign temporary contracts (with a ten year maximum) with public and private companies, which hinders energy saving initiatives and campus development (Omrcen et al., 2017).

4.1.1.5 Societal support

When universities fail to implement the needed sustainability measures, it is partly a societal failure of the ensemble of governments, markets, employers and educators to engage people with sustainability (Butt et al., 2014). Even if not directly influenced by a certain government policy, the general attitude of authorities towards issues of environment and climate change can affect the operations of a university. This has been observed in the US where in recent years some universities have taken steps back regarding the use of 'sustainability language' or the implementation of sustainability initiatives, sometimes on explicit demand of authorities (Finlay & Massey, 2012; Mohammadalizadehkorde & Weaver, 2018). Especially publicly funded universities could be prone to adjust their language and operations to the attitude of the authorities of the state or administration they are located in (Larrán Jorge et al., 2015; Mohammadalizadehkorde & Weaver, 2018). Results of sustainability initiatives can also be low in places where environmental challenges are not considered a main issue in the public opinion (Butt et al., 2014; Fedorov et al., 2018; Finlay & Massey, 2012).

4.1.2 The meso sphere

4.1.2.1 Communication

Lack of communication about environmental problems or initiatives can cause a lack of awareness and engagement with sustainability issues (Dagiliute & Liobikiene, 2015). An example of insufficient communication from the university administration towards students can be found at a public arts university in the US where a third of the students were unaware of the fact that their school had had a Student Office of Sustainability for the last six years, which was supported by student fees (Perrault & Clark, 2017). The same research gathered data on the students' preferred communication channels for sustainability matters. The preferred means of communication were: posters, teachers, Facebook, friends and emails (Perrault & Clark, 2017). There can also be a lack of communication from students towards the university. In their research, Butt et al. (2014) found no evidence that the universities were aware of the attitudes of students towards sustainability and that those views were being incorporated in the university policy. Leal Filho et al. (2017) highlights the lack of communication between administrative and academic staff at universities. Finally, Larrán Jorge et al. (2015) note that there might be a relation between whether or not a university discloses a sustainability report on its website and the actual level of sustainability initiatives at that institution.

4.1.2.2 Stakeholder engagement

The various stakeholders of a university, staff, students and community, can play an important role when it comes to implementing sustainability (Leal Filho et al., 2017). More than that, even when successfully implementing sustainable measures in the operations of the university, failing to engage stakeholders in this process reduces a lot of the value of the university's efforts and can be seen as a failure of carrying out its role in society (Dagiliute & Liobikiene, 2015). Therefore, universities should move away from a purely top-down approach when it comes to addressing sustainability issues and should encourage stakeholder participation (Dagiliute & Liobikiene, 2015; Salter et al., 2013). The level of environmental concern among stakeholders can be an obstacle to the implementation of sustainable measures and should therefore be enhanced, but is in reality often neglected in the practical development (Finlay & Massey, 2012; Larrán Jorge et al., 2015; Leal Filho et al., 2017). Srikun (2018), for example, finds that collaboration between relevant agencies, students, staff and community is crucial to promote energy awareness. This is supported in a general manner by Leal Filho et al. (2017) and Dagiliute & Liobikiene (2015) stating that obstacles can be overcome if all stakeholders are engaged in striving towards a sustainable university.

For many of the professors and university staff, sustainability is not a part of their background or training. Therefore, they need support and training in order to be able to integrate sustainability in their functions (Leal Filho et al., 2017). If this support is not provided, this stakeholder group might not be engaged in the process of making the university more sustainable which forms an obstacle to sustainable operations.

Students are another of the university's stakeholder groups. Their actions can generate new ideas and influence policy (Dagiliute & Liobikiene, 2015). It is therefore important for universities to understand the drivers behind student engagement and commitment when it comes to sustainability initiatives. In reality, universities often fail to recognize and engage students as key stakeholders (Butt et al., 2014). The results achieved by students can be quite modest in some cases due to their lack of experience in carrying out sustainability related projects (Fedorov et al., 2018). Moreover, student representatives in decision-making bodies can be challenging to work with due to lack of skill or the relatively short timeframe in which they engage with sustainability matters at the university (Butt et al., 2014). This leads to a situation where there is minimal student involvement in decisions and senior executives supported by their organizational staff make up the main drivers of the sustainability program (Butt et al., 2014).

Finally, there is also an important function of the community that is not part of the university. Leal Filho et al. (2017) finds the lack of connection and projects with the community and city to be an obstacle to sustainable initiatives. Universities have the potential to contribute to the wider society outside the institution and at the same time outsiders can encourage and support the university to become a more sustainable institution (Dagiliute & Liobikiene, 2015).

4.1.3 The micro sphere

4.1.3.1 Data

An obstacle to any kind of initiative is the lack of awareness of what is already being done and the current state of affairs (Dagiliute & Liobikiene, 2015). Decisions need to be scientific and evidence based (Butt et al., 2014). Limitations in data, access to data, monitoring and reporting all stand in the way of making progress in the implementation of sustainability in university operations (Dagiliute & Liobikiene, 2015; Fedorov et al., 2018; Srikun, 2018).

4.1.3.2 Inertia

Within individuals and institutions, there can be a reluctance to change or to do something about barriers because of the attachment to business as usual practices (Leal Filho et al., 2017). Tradition and conservative attitudes can be major obstacles for the implementation of environmental practices and rewards for change are often lacking (Finlay & Massey, 2012; Larrán Jorge et al., 2015; Leal Filho et al., 2017; Salter et al., 2013). Change can even be seen as a threat, leading to institutions actively maintaining the status quo and creating a social culture of inaction (Finlay & Massey, 2012; Larrán Jorge et al., 2015). Although universities are often the center of knowledge and technology creation, this innovation is in many cases not implemented in the university's operations (Leal Filho et al., 2017). Staff in operations departments is responsible for keeping things running at all time and can therefore be reluctant to adopt new technologies or processes (Leal Filho et al., 2017).

4.1.3.3 Knowledge

When it comes to sustainability, there is a lot of ignorance about the issues and the bigger picture, lack of consciousness (Leal Filho et al., 2017), unawareness about the risks (Leal Filho et al., 2017), no knowledge about how to incorporate sustainability in one's own life and work (Finlay & Massey, 2012), and a general lack of awareness about the need for sustainable innovation within the university's operations (Dagiliute & Liobikiene, 2015). Environmental considerations are missing from the training of students, teachers and other staff and sustainability is a missing concept in the training of workers and planners (Leal Filho et al., 2017). There tends to be a focus on technological solutions while the impacts and knowledge related to behavior and the promotion of a sustainable lifestyle are often neglected (Leal Filho et al., 2017).

4.1.3.4 Leadership

Universities need to have a clear commitment to sustainability in their vision, mission, goals and strategic documents (Dagiliute & Liobikiene, 2015). The commitment of the university's leadership along with it carrying out its responsibility of planning and staffing projects is a key determinant for the success of sustainability initiatives (Butt et al., 2014). Leaders with a supportive and inspiring attitude towards environmental measures and 'leading by example' have proven to impact pro-environmental behavior of employees (Ramos et al., 2015; Sammalisto et al., 2015). Lack of leadership with the abovementioned qualities and the lack of agenda, focus and decisions concerning sustainability are obstacles that lead to failure in mainstreaming sustainability in university operations (Butt et al., 2014; Larrán Jorge et al., 2015; Leal Filho et al., 2017).

4.1.3.5 Resources

Financial infeasibility and lack of staff are obstacles that are generally put forward by the management as reasons for failing to implement sustainable initiatives (Fedorov et al., 2018; Finlay & Massey, 2012; Larrán Jorge et al., 2015; Leal Filho et al., 2017; Mohammadalizadehkorde & Weaver, 2018; Salter et al., 2013; Sammalisto et al., 2015). A lot of initiatives require investments, but often they can also help to cut costs (Mohammadalizadehkorde & Weaver, 2018). Although organizations have to be aware of budget and staff, the mere focus on numbers neglects that universities also have a responsibility in terms of knowledge development and a responsibility towards society which includes stewardship of sustainability (Mohammadalizadehkorde & Weaver, 2018).

4.1.3.6 University governance

One aspect of university governance is the role of policy and commitments. Universities often formulate environmental actions as guidelines that can be followed voluntarily (Dagiliute & Liobikiene, 2015; Mohammadalizadehkorde & Weaver, 2018). The fact that these declarations are not binding and that non-compliance does not have any consequences leads to a lack of enforcement (Mohammadalizadehkorde & Weaver, 2018). While universities can still talk about their commitment and refer to the guidelines, the lack of actual action forms a big obstacle for advancing sustainability (Mohammadalizadehkorde & Weaver, 2018). The need for enforcing policy, however, does not have to result in rigid structures. In order to improve environmental performances, structures should be flexible and allow 'double loop learning', which means that results have to feed back into the decision-making in order to make further improvements in the future (Leal Filho et al., 2017).

Another aspect of university governance is the decision-making process. University administrations and management are also identified as barriers due to the slow paced nature of bureaucratic decision-making processes, the large amounts of paperwork and the use of 'middlemen' (Leal Filho et al., 2017).

Finally, the organizational structure can also have an impact on the environmental sustainability of the university. Universities tend to be segmented into different departments, faculties, institutes, etc. (Ramos et al., 2015; Salter et al., 2013). It can be challenging to implement a holistic university-wide approach for a diverse organization in which individuals are often focused on their specific areas (Leal Filho et al., 2017; Ramos et al., 2015). The contradictions and tensions that exist within the university, such as competition over resources or opposing views on sustainability, can only be addressed if there is an open dialogue (Leal Filho et al., 2017). The 'silo' structure of the university also creates a practical hindrance by causing mismatch between departments' schedules (Salter et

al., 2013). Responsibility and accountability can be ill-defined and universities sometimes lack a department, person or unit that provides a coordinated approach to deal specifically with environmental matters (Finlay & Massey, 2012; Salter et al., 2013). The lack of an environmental committee is seen as another obstacle since its role is to develop, implement and control initiatives that reduce the university's environmental impact (Finlay & Massey, 2012; Leal Filho et al., 2017).

4.2 Obstacles to sustainability in Lund University's operations

4.2.1 The macro sphere

4.2.1.1 Competition and growth

One interviewee mentioned growth and internationalization of the university as an obstacle for achieving absolute reductions in the GHG emissions of the university through measures such as reducing the total amount of traveling by university staff. Therefore, this person suggested that it could be better to measure in a relative way such as emissions per employee (Interviewee 2, personal communication, February 28, 2019).

4.2.1.2 Complexity

The Environmental Manager has, in his own words, a "traditional understanding of sustainability" which entails attention for issues as waste, chemicals, energy and procurement. He explains there is a strong emphasis on the legal aspect, the need to comply to all the rules and on safety and risk prevention "following the precautionary principle". He says also softer measures can be included, but they are not prioritized, because: "nothing is immediately going to happen to you if you eat meat now or don't eat meat, compared to the consequence of an explosion". One interviewee of the Sustainability Forum saw sustainability in a more broad and inclusive way, recognizing the complexity of the issue: "because sustainability issues are so broad, there is a multitude of policy documents existing already at the university on travel policy, inequality, gender, etc."

4.2.1.3 Context dependence

One of the canteen managers saw contextual factors as a big challenge in targeting meat consumption in the canteens. In some restaurants it would be possible to serve vegetarian or even vegan food all the time, while somewhere else people would get upset. The canteen manager also mentioned the high amount of people with dietary restrictions, special diets and allergies, especially among Swedes. These factors that vary among places and groups of people make any kind of general food policy difficult and put a lot of extra pressure on the kitchen (Interviewee 3, personal

communication, March 19, 2019). Furthermore, the number of meals that are served daily at different canteens varies greatly, meaning that the impact of a certain measure will also differ between places (Interviewee 3, personal communication, March 19, 2019; Interviewee 4, personal communication, April 30, 2019).

4.2.1.4 External regulation

One of the respondents mentioned external regulation as a limiting factor on possibilities. Especially since Lund University is a state agency, there are a lot of regulations about what is allowed and what is not (Interviewee 1, personal communication, February 14, 2019).

4.2.1.5 Societal support

Both canteen managers said that there is insufficient support among customers to switch completely to vegetarian meals. One of them said, when talking specifically about targeting meat consumption in the canteens, that at LTH (Lund University's technical faculty), people do not want to be offered vegetarian food, they have a strong preference and "demand" meat (Interviewee 3, personal communication, March 19, 2019). The interviewee emphasized the attitude with the following statement: "just like people say I'm a vegetarian, they say I'm a meat eater" (Interviewee 3, personal communication, March 19, 2019). One of the canteen managers has tried to implement one 'vegetarian food only' day per week, but the customers did not like the initiative so the canteens reverted to offering meat at every meal. Also the other canteen manager thinks their business would lose customers if they would only serve vegetarian food.

4.2.2 The meso sphere

4.2.2.1 Stakeholder engagement

One of the canteen managers said they talk a lot about environmental matters with Akademiska Hus (the organization managing the university buildings) and LTH (Interviewee 3, personal communication, March 19, 2019). These meetings tend to cover topics such as recycling and energy efficiency. The other canteen manager said there used to be regular meetings with the university, but that they have stopped and that there is little interaction left (Interviewee 4, personal communication, April 30, 2019). Both canteen managers say the university does not engage in discussions about the sustainability of the food related operations of the canteens.

4.2.2.2 Communication

The Environmental Manager has the formal mission of reporting to the university management once or twice a year about the status on goals, issues, risks, legal compliances regarding the environment. In this task, the Environmental Manager is supported by the Sustainability Forum which acts as a reference group to him and of which he is also a member of the steering committee. Through this channel both the Sustainability Forum and the Environmental Manager can bring issues to the Vice-Chancellor. The university administration consults experts from all faculties and departments in an informal way when needed for a certain issue (Interviewee 2, personal communication, February 28, 2019).

4.2.3 The micro sphere

4.2.3.1 Data

The Environmental Manager stated he deems the canteens' operations to be a part of the university's environmental impact, since "they are procured by the university, the buildings belong to Akademiska Hus, it's university students and staff eating there". However, the university does not collect numbers on food waste, meat consumption or any other data related to the canteen's core business. Collecting these numbers would require more staff in order to be able to dedicate time to that (Interviewee 2, personal communication, February 28, 2019). The Environmental Manager also said that ideally "Lund University should have a sustainability report like companies do with data on all relevant numbers." The areas for which data are gathered and monitored is largely following the structure of the reports required by the Ministry of Education and Research (Utbildningsdepartementet) and the Swedish Environmental Protection Agency (Naturvårdsverket) (Interviewee 2, personal communication, February 28, 2019). Since that report is premade, it is not possible to add in other information. In this way, these reports do not incentivize to collect data on other issues. Furthermore, what is being tracked and focused on is also a matter of prioritization according to potential risks and impact: Lund University has data on hazardous waste and energy (Interviewee 2, personal communication, February 28, 2019).

On the side of the canteens, the amount of vegetarian dishes and dishes containing meat is registered on a daily basis and old numbers are kept in the bookings. How much meat is bought is also registered in the bookings. These numbers, however, are not readily available and the university never asks for them (Interviewee 3, personal communication, March 19, 2019). One canteen manager said they would not just share all the numbers, but that, if necessary, they could try to get

certain data (Interviewee 3, personal communication, March 19, 2019). Weeks after the interview they apologized saying that it was “hard to get the data” and they would not manage this time. The other canteen manager was unsure about how and where the data is stored and whether it would differentiate between specific types of meat. Informed by the kitchen staff, the most detailed information the canteen manager could provide was that they serve 30-35kg of different proteins for lunch on a daily basis, calculated for 200g per person (Interviewee 4, personal communication, April 30, 2019).

4.2.3.2 Inertia

The process of providing services through procurements can lead to inertia in different ways. First, there can be a limited number of companies providing a certain service at the scale that is needed at the university (Interviewee 1, personal communication, February 14, 2019). Second, if the demands for the procurement by the university are too detailed or hard to fulfill, there might be crowding out of potential suppliers (Interviewee 2, personal communication, February 28, 2019). Finally, the university cannot make use of alternative services that affect the procurement. One interviewee says this is “very frustrating”, when on a daily basis it is impossible to make use of what would be considered a better option (Interviewee 1, personal communication, February 14, 2019). The interviewee adds that “everything is a long process, and often for sustainability we want things to happen quickly, and things have to happen quickly, so there is this mismatch between this and the time it takes for a proper democratic process that is free of corruption, so obstacles do exist for a reason” (Interviewee 1, personal communication, February 14, 2019).

4.2.3.3 Knowledge

Knowledge about sustainability at the university is extremely dispersed. It is spread out across faculties, networks and hubs, making it impossible to pinpoint it in a certain part of the organization (Interviewee 1, personal communication, February 14, 2019; Interviewee 2, personal communication, February 28, 2019). Besides the scientific knowledge in the research community, one of the interviewees stresses the importance of practical knowledge in the different sections of the university such as those working with IT, finance, external relations, infrastructure, cleaning, transportation, etc. (Interviewee 1, personal communication, February 14, 2019).

Both respondents of the Sustainability Forum and the Environmental Manager said they are aware of nudging as a policy tool. When asked about examples at the university one respondent referred to that certain departments have started only offering vegetarian alternatives when ordering catering (Interviewee 1, personal communication, February 14, 2019). This is strictly speaking not nudging

because the freedom of choice has been taken away. One interviewee of the Sustainability Forum was unsure whether the communication aim of the Sustainability Forum could qualify as nudging: “because when you lift something, when you make it visible, it does inspire people to think within their own spheres to take their own area one step further, I don’t know if that’s nudging but...” This action can be seen as influencing social norms to induce certain behavior. Another respondent could not think of any clear example of the application of nudging principles for sustainability at Lund University (Interviewee 2, personal communication, February 28, 2019).

One of the canteen managers talked about environmental and health benefits of reduced meat consumption, but had never heard of ‘nudging’ or ‘behavioral insights’. The interviewee did not think that changing the order of dishes on a menu would result in any change of behavior. The other canteen manager was also not familiar with the concept of nudging, but was aware of the fact that the menu order can affect people’s behavior. This was due to the fact that the company that owns the canteen decided in April 2019 to display the vegetarian option first. With this measure they are hoping to stimulate people to order the vegetarian dish. Both canteen managers agreed that people ‘eat with their eyes’ and that the food that is visible when standing in line for ordering could influence one’s own order. However, both also expressed practical concerns about freshness regarding the idea of exposing a warm meal for the duration of lunchtime.

4.2.3.4 Leadership

All of the interviewees make clear that the operations of the canteens are not being discussed much at management level. The Environmental Manager says that “there are no goals around that, it is the responsibility of the canteens, it’s their own decisions. Not everything should be decided by the management, they should only take decisions about really big matters otherwise there are too many decisions”. There are, however, a number of demands in the procurement with the canteens that aim at reducing environmental impact such as KRAV certified coffee, electric vehicles for transportation and rules on where the meat comes from (Interviewee 2, personal communication, February 28, 2019; Interviewee 3, personal communication, March 19, 2019).

Procurement is one of the four areas in Lund University’s environmental action plan (Lund University, 2017). The food services at Lund University are procured, which in this case means that LU Estates is responsible for the agreements with the suppliers. Just like the canteens, flights are also a part of procurements, but have intentionally received a separate category in the plan because of their large GHG emissions (Interviewee 2, personal communication, February 28, 2019). Within the procurements category, the focus on environmental impact of working clothes and security services

was “just because of the timing”, because those procurements had to be renewed (Interviewee 2, personal communication, February 28, 2019).

To receive attention from the management, a topic thus has to be very large and impactful, or coincidentally relevant at a certain time. This view was reflected by one of the canteen managers who said that the university is only interested in big changes when it comes to the canteens and that “the university could put all of those things in the procurement, depends on who is making it. The university gives us freedom, people we do the procurement with they do not care about that and don’t have time for that” (Interviewee 3, personal communication, March 19, 2019). The other canteen manager said that the university does not drive sustainability in the canteen operations since the canteens already meet all its requirements. The canteens also cater food to companies that have higher requirements in terms of sustainability (for example packaging) than the university (Interviewee 4, personal communication, April 30, 2019).

4.2.3.5 Resources

One interviewee pointed out that more resources to work on sustainability issues would be beneficial. First, only two people are in charge for the estate department at the central level, while “there could probably be five people working on it” (Interviewee 2, personal communication, February 28, 2019). It would for example be valuable to have a communicator to spread the word about the sustainability related initiatives, because “now all the human resources go into the practicalities which leaves no time to communicate about it” (Interviewee 2, personal communication, February 28, 2019). Second, the fact that there is not much attention for the sustainability of the canteens and that data on that topic are not collected, can also be attributed to the limited staff involved in these matters (Interviewee 2, personal communication, February 28, 2019). Cost efficiency is always an important factor in procurements (Interviewee 1, personal communication, February 14, 2019). This means that environmental considerations are potentially less influential in the decision-making than the costs and also that costly demands could be avoided (Interviewee 1, personal communication, February 14, 2019). One of the canteen managers saw the high work load of the staff as an obstacle preventing measures that might be time consuming, such as ‘climate labeling’ the menu options (Interviewee 3, personal communication, March 19, 2019).

4.2.3.6 University governance

The proposal for Lund University's sustainability strategy is based on the higher education law (Högskolelag) that requires all higher education to work for sustainable development (Interviewee 1, personal communication, February 14, 2019). The strategy states that sustainability issues should be integrated everywhere, "which does not mean that it can be integrated in exactly the same way everywhere" (Interviewee 1, personal communication, February 14, 2019). Drafting the strategy was a top down request coming from the University Board, but the process included conversations with all relevant parts in the organization, the final approval has to be given by the Vice-Chancellor. The inclusion of all relevant actors is part of what one interviewee calls 'collegial leadership': "it is not like in a company where you have a CEO making decisions, at Lund University there are many leaders and decisions take time, which is positive because many people are heard and there is input from everyone, but negative because decisions are slow" (Interviewee 2, personal communication, February 28, 2019).

According to the Sustainability Forum, there is not just one path to turn knowledge about sustainability issues into action at the university. Changes are a result of awareness raising by different actors at the university. This was partially confirmed by the Environmental Manager: "I can come up with my own initiative and make a proposal around that, it could also be based on a request from people, maybe not for one person, but if it's 1000 people, it should be looked at".

At which level of the organization exactly the decision on a certain topic is made depends on the amount of resources (human or monetary) that is needed following the decision. For example: "If the decision is only to serve vegetarian food at LU, that is a statement and the management would decide. If the decision is more neutral: canteens should have both veggie and meat option, then it would be the procurement department deciding" (Interviewee 2, personal communication, February 28, 2019). This shows that, depending on the implications of a certain decision, the decision-making power is centralized or decentralized. In general, the management sets the goals and strategy whereas the different departments and services such as the procurement department decide specifics and implement the changes. The Environmental Manager said that "there is no written rule that says what should in every case be a responsibility of management or department, but if you work in it, it is very clear". There are no environmental specialists at the procurement department, but they "know a lot from experience" (Interviewee 2, personal communication, February 28, 2019).

One of the canteen managers said that in some sense, the company is part of the university, but then again not really. In terms of infrastructure for example, changes can be difficult because the canteen manager is not allowed to take these decisions. Regarding the decisions around food, things are different. The university can make requirements, but they are always negotiated. “Most of the time it doesn’t work their (procurement department) way because they have their wishes, but they are not in the restaurant business … It’s all about winning the procurement so we agree to that and then we see how much we can do in reality” (Interviewee 3, personal communication, March 19, 2019).

4.3 Behavioral insights at Lund University canteens

From observing the menu and restaurant settings of the thirteen canteens located in Lund, it emerged that there is high variability in terms of seating capacity, price, and food variety, style, and quality. The food ranged from fast food to healthy food and from only sandwiches or premade dishes to freshly cooked meals and buffets. Table 2 gives an overview of the attributes that were checked for in the thirteen canteens that are procured by the university and located in Lund.

Table 2. Overview of the observed attributes in canteens procured by Lund University

Name	Veg available	Veg cheaper	Veg visible	Veg first
Bryggan Kök & Café	Yes	No	No	Yes
Café Botan	Yes	No	No	No
Café Eden	Yes	No	No	No
Café Hjärtat	Yes	No	No	No
Café Holger	Yes	No	No	No
Café Juridicum	Yes	N/A	No	No
Café LUX	Yes	Yes	No	No
Café UB	Yes	No	No	No
Ester Mat & Café	Yes	N/A	N/A	No
Moroten & piskan	Yes	No	No	No
På Skissernas	Yes	No	No	No
Restaurang SOL	Yes	No	No	No
Stamstället	Yes	No	No	No

4.3.1 Availability

At least one vegetarian option (warm meal, sandwich or salad) was available in every canteen. The degree to which ordering a vegetarian option was encouraged by the options, however, differed between places and is not visible in Table 2. Café Juridicum and Café Holger, for example, did not offer a vegetarian warm meal. På Skissernas had a lunch menu with a meat dish that varied daily, but offered the same vegetarian alternative during the entire week. Ester Mat & Café on the other hand offered a vegetarian lunch buffet and options with meat were only found in the sandwiches and salads.

4.3.2 Price

In most cases, the price for dishes containing meat and the vegetarian alternative was the same. The only exception was at Café LUX where the vegetarian option was slightly cheaper (69 versus 72 SEK). Prices were comparable across canteens and aimed at affordability for students with student discounts. Prices at På Skissernas and, to a lesser extent Café Botan, were more elevated.

4.3.3 Menu order

There was a clear trend in the order of dishes on the menus: the vegetarian option was usually mentioned below or after dishes that contain meat. This was for example the case for Café Sol, Café LUX, Café Hjärtat, Stamstället, Café UB and Moroten & piskan in the order of 'husman' or 'dagens' and 'veggo'. It was also the case at Café Botan where the vegetarian option was the last one for both the sandwiches and the salads. In På Skissernas, the vegetarian option was listed at the bottom of the menu. Bryggan Kök & Café was the only exception by displaying the vegetarian option first.

4.3.4 Visibility

The visibility of the food was equal across all options (vegetarian, meat,…) within a certain category (warm meal, sandwich, salad,…). The sandwiches and salads were kept in fridges in no particular way, while the ingredients of warm meals were kept in containers behind the counter and thus invisible until they are ordered. There was no extra visibility for vegetarian options, nor were they 'disadvantaged' compared to the dishes that contain meat.

5 Discussion

> [A sustainable university is] a higher educational institution… that addresses, involves and promotes, on a regional or a global level, the minimization of negative environmental, economic, societal, and health effects generated in the use of their resources in order to fulfill its functions of teaching, research, outreach and partnership, and stewardship in ways to help society make the transition to sustainable lifestyles. (Velazquez, Munguia, Platt, & Taddei, 2006, p. 812)

The focus in this paper was on the environmental impact of the university's operations, which is, as shown by the above definition, only one aspect of both sustainability and universities. Lund University commits to sustainability by "making reliable knowledge available", "practicing what we preach" and "every-day activities characterized by continuous improvements" (Lund University, 2016, p. 1). However, this paper demonstrated that there are obstacles hindering sustainable university operations.

Answering the first research question, the literature review identified and conceptualized thirteen obstacles to sustainability in university operations. Answering the second research question, interviews with key stakeholders revealed that these obstacles are also present at Lund University and that many of them have implications for the implementation of sustainable practices in the canteens. The final research question was answered through direct observation which led to the conclusion that current scientific knowledge with implications for sustainability is not exploited to its fullest potential.

5.1 The Cogwheel Framework

5.1.1 Framework versus previous literature

Of the 14 articles included in the literature review, only Leal Filho et al. (2017) attempt to create an overview of obstacles to sustainable development at universities. Their study presents an extensive list of 25 obstacles based on the input of 51 international expert surveys. The scope of the study includes sustainability in education, research and operations. The article is a good starting point and a valuable input for conceptualizing obstacles to sustainable university operations. However, the list presented in their study has certain limitations due to ambiguity and incompleteness. In some cases the attribution of data to a certain category is questionable ('people do not understand the term

sustainability' is categorized under 'resistance to changes in behavior'). Since the findings are not schematized, there is no clear differentiation between the spheres in which different obstacles occur, which makes it look like everything takes place in the same entity. In some cases this also causes unclarity about the domain (education, research, operations or multiple) in which a certain obstacle is actually impeding sustainable development. Most of the obstacles are not explained in depth, which leaves them open for interpretation and makes it hard to differentiate them from seemingly similar obstacles on the list. Some of the obstacles that are mentioned, such as 'lack of buildings with environmental performance' or 'technology' are clearly manifested consequences or parts of other obstacles rather than underlying causes of impediment, and thus should probably be conceptualized at a different level rather than in the same list. There is quite some overlap between obstacles (lack of environmental officer, lack of policy, lack of resources etc. are mentioned under multiple obstacles), which makes certain obstacles redundant. The repetition could be a sign of interdependency between the obstacles, but this is not clear from the explanation or presentation. Some of the obstacles are only relevant for research and education and therefore not useful for the identification of obstacles in the scope of this paper. Finally, the concepts 'growth and competition', 'societal support' and 'data' which I identified as obstacles are completely absent from the study. Appendix 5 compares the conceptualization of obstacles by Leal Filho et al. (2017) and this paper.

5.1.2 Framework versus reality

The Cogwheel Framework developed in this paper has proven to be a useful way to organize the information obtained from interviews. All of the obstacles identified in literature were mentioned in some way by at least one of the respondents (Figure 5). From this, it is at least possible to conclude that the obstacles in the framework have a good reason to be included. Moreover, no information provided by the interviewees that could be seen as an obstacle fell outside of all the categories in the framework. Although this does not prove that the framework's list of obstacles is exhaustive, it is a first potential indication that no major category has been overlooked.

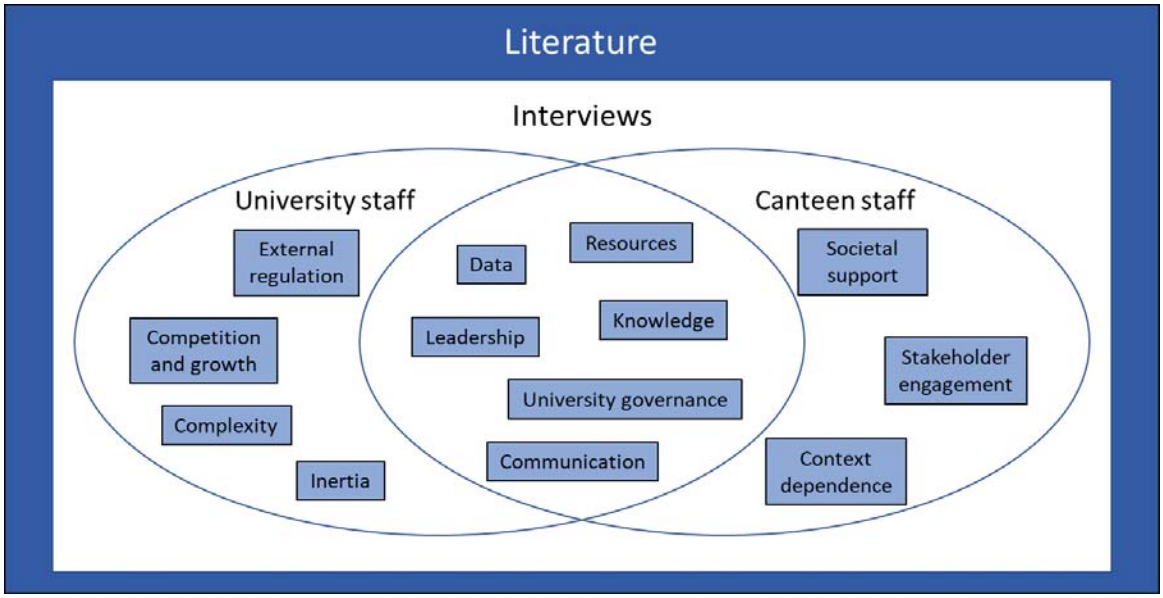


Figure 5. Diagram depicting where the obstacles were mentioned.

The data from the interviews support the choice for a cogwheel pattern depicting general interdependency between obstacles. The framework does however not show explicit links between specific obstacles that were mentioned in either literature or interviews. One example of such a link is the inertia in certain services that is an inherent part of the procurement system. The rules concerning procurements are set by external authorities, not by the university itself. This means that external regulation can be seen as the cause of this specific case of inertia. A second example is that the obstacle of lacking data is partially caused by the lack of resources to collect it. Another limitation of the Cogwheel Framework is the rigid categorization of obstacles in separated spheres. The interviews show that this division is not an accurate representation of reality. In the framework, knowledge is positioned in the micro sphere. The reason for this is that lack of knowledge at the university about sustainability or how to implement it hinders sustainable university operations. However, for some operations the university relies on stakeholders, such as suppliers of certain services, in this case study the canteen managers. Although the university still has a large degree of decision-making power over these services, it is not the only actor that can make decisions. The direct observation and interviews show that this is the case for example for the implementation of a nudge at Bryggan Kök & Café that was implemented without the university's influence. Therefore, lack of knowledge among stakeholders, in the meso sphere of the framework, can also be an obstacle to sustainable university operations. This demonstrates the presence and importance of knowledge at different levels described in literature on governance and cross-scale dynamics (Cash et al., 2006). Other obstacles might also manifest themselves in multiple spheres, this was for example the case with the lack of resources at both the canteen and the university level.

5.2 Desirability, viability and achievability of nudging in Lund University canteens

5.2.1 Desirability

Nudging to reduce meat consumption in Lund University canteens is desirable since meat production accounts for a large part of anthropogenic GHG emissions (Gerber et al., 2013; Grabs, 2015; Kurz, 2017). Furthermore, besides mitigating GHG emissions, reducing meat consumption comes with other benefits to human health and the environment (Hallström et al., 2014). These are arguments for making meat consumption a focus area within the management of the canteens as a part of the transition towards more sustainable university operations.

5.2.2 Viability

Both the literature and interviews show that there are obstacles to the implementation of sustainability in university operations, that this is also the case at Lund University and that many of these also hinder the implementation of nudging in the canteens. Although it is currently not a priority, the interviewees generally support the idea of reducing meat consumption. Nudges could be a viable approach given the concerns expressed by the canteen managers about the loss of customers in the case of more restrictive measures. The interventions discussed in this paper were changing the order on the menu and making the vegetarian dish visible. These interventions are low-effort and low-investment measures that are likely to lead to a reduced consumption of meat in the canteens. This means that in the debate of whether policy should aim for 'reasonably achievable emissions reductions' that can be adopted by large numbers of people or emission reductions in 'high-impact areas' (Wynes et al., 2018) nudging has the potential to enable both at the same time. One way for the university to enforce the implementation of these measures would be to include them in the procurements between the university and the canteens. These procurements already include some environmental and ethical requirements, but no policy aiming at reducing meat consumption, which would significantly improve the canteens' sustainability.

5.2.3 Achievability

In the current business as usual scenario characterized by limited knowledge and other priorities it seems rather unlikely that behavioral insights will soon become part of the sustainability strategy for Lund University canteens. However, there are at least three levels of decision-making that have the 'power' to push the implementation of the intervention: the university, the company owning the canteen and the canteen management. At the university level, there was some knowledge of, but

only a moderate interest in these measures. At the canteen level this knowledge was absent, but there was much more enthusiasm and willingness to experiment. In the only case in which a nudge was already implemented (vegetarian option first on menu in Bryggan Kök & Café), it was the company owning the canteen that had implemented this intervention. The fact that three companies own the majority of the canteens also helps, since it means that a relatively low number of actors needs to be informed and convinced.

5.3 Overcoming obstacles

After formulating the problem, conceptualizing a model and comparing it with the empirical data, what follows are my recommendations for more sustainable university operations.

Lund University should not set complying with **external regulation** as a goal, it should be the baseline for all activities.

The university should see the current **societal support** for sustainability as an opportunity to reform the institution accordingly.

Given the fact that knowledge about sustainability is extremely dispersed across experts in the university 'silo's', there should be a systematic rather than an ad hoc way of **communication** for scientific findings that have relevant policy applications and could help the university become more sustainable. This information can then feed into the university management's decisions and be communicated to the relevant level of agency for that specific matter, in the case of nudging to reduce meat consumption in the canteens, that would be the canteen managers.

The university needs to give clear signals towards all stakeholders that it aims for more sustainability in all of its operations and that this requires **stakeholder engagement**. For canteens this would imply support for actions that reduce the canteens' environmental impacts such as the purchase of low carbon foods and nudging customers towards vegetarian options. Given the high workload that the canteen staff already faces and the potential crowding out effect of excessive demands in procurements, the university needs to facilitate these efforts as much as possible.

Lund University needs to improve the collection, monitoring and reporting of **data** on all the parameters that are relevant for its environmental impact, not only the few categories addressed in the mandatory yearly reports.

University governance: There should be a clear systematic channel and procedure through which individuals can inquire about and act upon sustainability matters at the university. There should be

people with environmental expertise in the procurement units of the university who have the **knowledge** to assess in a correct way the impact of different measures in order to include relevant factors in the agreements.
The procurements, including those with the canteens, should be evaluated to see if the current sustainability demands are the most impactful ones, or if they can be complemented with other measures. Nudging can be a non-controversial tool to reduce meat consumption in the canteens, which is likely one of the most impactful ways to create a behavior shift that cuts GHG emissions from food at Lund University.

The university needs to dedicate more **resources** to environmental matters. The environmental committee should consist of more than two people at the central level in order to be able to pay attention to and act on the wide range of issues within the university's operations that have an environmental impact.

5.4 Limitations of the study

The case study research design entails certain methodological limitations. First, findings are sometimes seen as subjective since the data such as concepts or patterns derived from the research can differ between researchers. Second, due to the important role of contextuality, results may not be suitable for generalization to other contexts (Bhattacherjee, 2012).

The setting of the experiment in Kurz (2017), being a campus canteen at a Swedish university is very similar to the focus in this paper. For reasons of external validity, the results of this study might be best suited to predict the effects of potential interventions in the context of Lund University. However, due to the high context dependence of behavioral interventions, these numbers remain guesses without an actual experiment. Only experiments in the actual setting of interest will show whether nudging will indeed reduce meat consumption in this setting.

Estimating and measuring the effects and environmental benefits of nudges in Lund University canteen settings requires accessible data on meat consumption. This data is not available at the university. Therefore it was requested from two canteen managers but none of them managed to deliver the necessary data. Moreover, this paper has only mentioned the 'in house' food in the canteens without taking into consideration the catering services that are provided at the university. To discuss the total meat consumption at the university, catering should also be part of the analysis. In terms of the application of nudging, however, this entails a separate approach since the decision-making setting when ordering catering is completely different from the canteen setting.

5.5 Future research

Building on this study, research should aim to find out how to facilitate the systematic communication of relevant scientific knowledge to the right level, department or individual in the organization to enhance implementation of sustainable policy. The way in which the university could gather, monitor and report all the relevant data to measure and reduce its environmental impact is another question that will need to be answered. Furthermore, research running an experiment with nudges in the Lund University canteens and following up on the recent intervention at Bryggan Kök & Café could determine whether including behavioral insights in the policy has the expected potential for reducing meat consumption in this setting.

6 Conclusion

Universities are an important source of knowledge in the field of sustainability. However, they also face many obstacles on the road to the implementation of sustainability in their own operations. Through the literature review, this paper identified thirteen obstacles to sustainable university operations. These obstacles were then conceptualized in a Cogwheel Framework that depicts the spheres in which the obstacles manifest themselves and the interdependency between them. The interviews with key stakeholders revealed that all of these thirteen obstacles are also present at Lund University to some extent. These obstacles prevent relevant and available scientific knowledge from being exploited to its fullest potential. An example of this at Lund University is that nudges are, even though they have proven their usefulness, still absent from the canteen settings. The implementation of nudges is a low-effort, low-investment measure with the potential of achieving widespread emission reductions in high-impact areas, such as meat consumption. Moreover, nudges would not cause customer dissatisfaction since they contribute to more sustainable consumption at the university in a way that does not hamper with the individual's freedom of choice. In a similar manner, behavioral insights could be applied to achieve more sustainability in other domains such as energy efficiency or waste reduction. Nudging in Lund University canteens is desirable, viable and achievable. However, it is unlikely to happen out of nowhere in a context where compliance with external regulation and 'high-risk' areas are prioritized and take up most of the resources. More resources for sustainability matters, improved stakeholder engagement, more systematic communication and more active awareness of and action against other obstacles would allow the university to act on a wider range of sustainability issues than is currently the case.

Supported by scientific literature, society and stakeholders, universities have the potential and the responsibility to implement sustainability in all aspects. Sustainability should be integrated in daily operations and management, curriculum and outreach to community. Universities are in a unique position to be leaders in sustainability, not working towards this would be a missed opportunity for the needed sustainable transition in society.

7 References

Adams, C. A. (2013). Sustainability reporting and performance management in universities. *Management and Policy Journal*, *4*(3), 384–392. https://doi.org/10.1108/MRR-09-2015-0216

Adua, L., York, R., & Schuelke-Leech, B.-A. (2016). The human dimensions of climate change: A micro-level assessment of views from the ecological modernization, political economy and human ecology perspectives. *Social Science Research*, *56*, 26–43. https://doi.org/10.1016/j.ssresearch.2015.10.003

Alshuwaikhat, H. M., & Abubakar, I. (2008). An integrated approach to achieving campus sustainability : assessment of the current campus environmental management practices, *16*, 1777–1785. https://doi.org/10.1016/j.jclepro.2007.12.002

Beshears, J., Choi, J. J., Laibson, D., & Madrian, B. C. (2008). How are preferences revealed ? ☆, *92*, 1787–1794. https://doi.org/10.1016/j.jpubeco.2008.04.010

Bhattacherjee, A. (2012). *Social Science Research: Principles, Methods, and Practices* (2nd ed.). USF Tampa Library Open Access Collections.

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

Butt, L., More, E., & Avery, G. C. (2014). The myth of the "green student": Student involvement in Australian university sustainability programmes. *Studies in Higher Education*, *39*(5), 786–804. https://doi.org/10.1080/03075079.2012.754861

Byerly, H., Balmford, A., Ferraro, P. J., Hammond Wagner, C., Palchak, E., Polasky, S., … Fisher, B. (2018). Nudging pro-environmental behavior: evidence and opportunities. *Frontiers in Ecology and the Environment*, *16*(3), 159–168. https://doi.org/10.1002/fee.1777

Campbell-arvai, V. (2015). Food-related environmental beliefs and behaviours among university undergraduates A mixed-methods study, *16*(3), 279–295. https://doi.org/10.1108/IJSHE-06-2013-0071

Campbell-arvai, V., Arvai, J., & Kalof, L. (2014). Motivating Sustainable Food Choices : The Role of Nudges , Value Orientation , and, (May 2015). https://doi.org/10.1177/0013916512469099

Carlsson, F., & Johansson-Stenman, O. (2012). Behavioral Economics and Environmental Policy. *Annual Review of Resource Economics*, *4*(1), 75–99. https://doi.org/10.1146/annurev-resource-110811-114547

Cash, D. W., Adger, W. N., Berkes, F., Garden, P., Lebel, L., Olsson, P., … Young, O. (2006). Scale and Cross-Scale Dynamics: Governance and Information in a Multilevel World. *Ecology and Society*, *11*(2), art8. https://doi.org/10.5751/ES-01759-110208

Climate Action Tracker. (2018). *Some progress since Paris, but not enough, as governments amble towards 3°C of warming*. Retrieved from: https://climateactiontracker.org/publications/warming-projections-global-update-dec-2018/

Codagnone, C., Veltri, G. A., Lupiáñez-Villanueva, F., & Bogliacino, F. (2014). The challenges and opportunities of 'nudging.' *Journal of Epidemiology and Community Health*, *68*(10), 909–911. https://doi.org/10.1136/jech-2014-203948

Dagiliute, R., & Liobikiene, G. (2015). University contributions to environmental sustainability: Challenges and opportunities from the Lithuanian case. *Journal of Cleaner Production*, *108*, 891–899. https://doi.org/10.1016/j.jclepro.2015.07.015

Davis, S. J., & Caldeira, K. (2010). Consumption-based accounting of CO2 emissions. *Proceedings of the National Academy of Sciences*, *107*(12), 5687–5692. https://doi.org/10.1073/pnas.0906974107

Evangelinos, K. I., Jones, N., & Panoriou, E. M. (2009). Challenges and opportunities for sustainability in regional universities : a case study in Mytilene , Greece. *Journal of Cleaner Production*, *17*(12), 1154–1161. https://doi.org/10.1016/j.jclepro.2009.02.020

Fedorov, A., Zakablukovskiy, E., & Galushkina, A. (2018). Making an urban university 'green': uniting administration and students towards synergy. *E3S Web of Conferences*, *48*, 02007. https://doi.org/10.1051/e3sconf/20184802007

Finlay, J., & Massey, J. (2012). Eco-campus: Applying the ecocity model to develop green university and college campuses. *International Journal of Sustainability in Higher Education*, *13*(2), 150–165. https://doi.org/10.1108/14676371211211836

Francis, M., & Moore, T. (2019). University Buildings: The Push and Pull for Sustainability. In P. Rajagopalan, M. M. Andamon, & T. Moore (Eds.), *Energy Performance in the Australian Built Environment, Green Energy and Technology* (pp. 131–147). Singapore: Springer Singapore. https://doi.org/10.1007/978-981-10-7880-4

Gerber, P. J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., … Tempio, G. (2013). *Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities*. Rome. https://doi.org/10.1016/j.anifeedsci.2011.04.074

Grabs, J. (2015). The rebound effects of switching to vegetarianism. A microeconomic analysis of Swedish consumption behavior. *Ecological Economics*, *116*, 270–279. https://doi.org/10.1016/j.ecolecon.2015.04.030

Hallström, E., Röös, E., & Börjesson, P. (2014). Sustainable meat consumption: A quantitative analysis of nutritional intake, greenhouse gas emissions and land use from a Swedish perspective. *Food Policy*, *47*, 81–90. https://doi.org/10.1016/j.foodpol.2014.04.002

IPCC. (2018). *Summary for Policymakers*. *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change,*.

Jerneck, A., Olsson, L., Ness, B., Anderberg, S., Baier, M., Clark, E., … Persson, J. (2011). Structuring sustainability science. *Sustainability Science*, *6*(1), 69–82. https://doi.org/10.1007/s11625-010-0117-x

Kahneman, D. (2011). *Thinking, fast and slow*. New York, NY, US: Farrar, Straus and Giroux.

Kates, R. W. (2011). What kind of a science is sustainability science? *Proceedings of the National Academy of Sciences*, *108*(49), 19449–19450. https://doi.org/10.1073/pnas.1116097108

Kurz, V. (2017). *Essays on behavioral economics: Nudges, food consumption and procedural fairness*.

Larrán Jorge, M., Herrera Madueño, J., Calzado Cejas, M. Y., & Andrades Peña, F. J. (2015). An approach to the implementation of sustainability practices in Spanish universities. *Journal of Cleaner Production*, *106*, 34–44. https://doi.org/10.1016/j.jclepro.2014.07.035

Leal Filho, W., Wu, Y. C. J., Brandli, L. L., Avila, L. V., Azeiteiro, U. M., Caeiro, S., & Madruga, L. R. da R. G. (2017). Identifying and overcoming obstacles to the implementation of sustainable development at universities. *Journal of Integrative Environmental Sciences*, *14*(1), 93–108. https://doi.org/10.1080/1943815X.2017.1362007

Lehner, M., Mont, O., & Heiskanen, E. (2016). Nudging – A promising tool for sustainable consumption behaviour? *Journal of Cleaner Production*, *134*, 166–177. https://doi.org/10.1016/j.jclepro.2015.11.086

Lund University. (2016). *Lund University's policy for sustainable development*. Retrieved from: https://www.staff.lu.se/sites/staff.lu.se/files/lund-universitys-policy-for-sustainable-development.pdf

Lund University. (2017). *Lund University's environmental action plan 2017–2019*. Retrieved from: https://www.staff.lu.se/sites/staff.lu.se/files/lund-universitys-environmental-action-plan-2017-2019.pdf

Machovina, B., Feeley, K. J., & Ripple, W. J. (2015). Biodiversity conservation: The key is reducing meat consumption. *Science of the Total Environment*, *536*, 419–431. https://doi.org/10.1016/j.scitotenv.2015.07.022

Miller, T. R. (2013). Constructing sustainability science: Emerging perspectives and research trajectories. *Sustainability Science*, *8*(2), 279–293. https://doi.org/10.1007/s11625-012-0180-6

Mohammadalizadehkorde, M., & Weaver, R. (2018). Universities as models of sustainable energy-consuming communities? Review of selected literature. *Sustainability (Switzerland)*, *10*(9), 1–17. https://doi.org/10.3390/su10093250

Müller-Christ, G., Sterling, S., Van Dam-Mieras, R., Adomßent, M., Fischer, D., & Rieckmann, M. (2014). The role of campus, curriculum, and community in higher education for sustainable development - A conference report. *Journal of Cleaner Production*, *62*, 134–137. https://doi.org/10.1016/j.jclepro.2013.02.029

Omrcen, E., Dalbro, M., & Lundgren, U. (2017). Universities as role models for sustainability: a case study on implementation of University of Gothenburg climate strategy, results and experiences from 2011 to 2015. *International Journal of Innovation and Sustainable Development*, *12*(1/2), 156. https://doi.org/10.1504/ijisd.2018.10009937

Perrault, E. K., & Clark, S. K. (2017). Sustainability in the University Student's Mind: Are University Endorsements, Financial Support, and Programs Making a Difference? *Journal of Geoscience Education*, *65*(2), 194–202. https://doi.org/10.5408/16-156.1

Platt, A., & Warwick, S. (1995). Review of soft systems methodology. *Industrial Management & Data Systems*, *95*(4), 19–21. https://doi.org/10.1108/02635579510086698

Ramos, T. B., Caeiro, S., Ceulemans, K., van Hoof, B., Huisingh, D., & Lozano, R. (2015). Experiences from the implementation of sustainable development in higher education institutions: Environmental Management for Sustainable Universities. *Journal of Cleaner Production*, *106*, 3–10. https://doi.org/10.1016/j.jclepro.2015.05.110

Rotmans, J., & Loorbach, D. (2009). Complexity and transition management. *Journal of Industrial Ecology*, *13*(2), 184–196. https://doi.org/10.1111/j.1530-9290.2009.00116.x

Salter, S., Murray, S., Davison, A., Fallon, F., & Towle, N. (2013). Establishing a Community of Practice and Embedding Education for Sustainability at the University of Tasmania. *The International Journal of Social Sustainability in Economic, Social and Cultural Context*, *9*(1), 33–44. https://doi.org/10.18848/2325-1115/CGP

Sammalisto, K., Sundström, A., & Holm, T. (2015). Implementation of sustainability in universities as perceived by faculty and staff - A model from a Swedish university. *Journal of Cleaner Production*, *106*, 45–54. https://doi.org/10.1016/j.jclepro.2014.10.015

Selinger, E., & Whyte, K. P. (2012). Nudging Cannot Solve Complex Policy Problems. *European Journal of Risk Regulation*, *3*(01), 26–31. https://doi.org/10.1017/S1867299X0000177X

Spangenberg, J. H. (2011). Sustainability science: A review, an analysis and some empirical lessons. *Environmental Conservation*, *38*(3), 275–287. https://doi.org/10.1017/S0376892911000270

Srikun, I. (2018). Electricity sustainable energy management model for community development holistically in Phranakhon Rajabhat University. *MATEC Web of Conferences*, *204*, 01017. https://doi.org/10.1051/matecconf/201820401017

Stern, D. I. (2004). The Rise and Fall of the Environmental Kuznets Curve. *World Development*, *32*(8), 1419–1439. https://doi.org/10.1016/j.worlddev.2004.03.004

Thaler, R. H., & Sunstein, C. R. (2008). *NUDGE: Improving Decisions About Health, Wealth, and Happiness*.

Universiteten Måste Själva Börja Klimatomställningen. (2018, October 28). *Dagens Nyheter*. Retrieved from: https://www.dn.se/debatt/universiteten-maste-sjalva-borja-klimatomstallningen/

Velazquez, L., Munguia, N., Platt, A., & Taddei, J. (2006). Sustainable university: what can be the matter? *Journal of Cleaner Production*, *14*(9–11), 810–819. https://doi.org/10.1016/j.jclepro.2005.12.008

Wright, E. O. (2010). *Envisioning Real Utopias*. London: Verso.

Wynes, S., Nicholas, K. A., Zhao, J., & Donner, S. D. (2018). Measuring what works: Quantifying greenhouse gas emission reductions of behavioural interventions to reduce driving, meat consumption, and household energy use. *Environmental Research Letters*, *13*(11). https://doi.org/10.1088/1748-9326/aae5d7

8 Appendices

Appendix 1: Cited and original sources in literature review

Obstacle	Cited	Original source(s)
Macro		
Competition and growth	Butt et al., 2014	
	Dagiliūtė & Liobikienė, 2015	
	Francis & Moore, 2019	Ward SC (2012); Department of Education and Training (2015)
	Larrán Jorge et al., 2015	Sanje and Senol (2012); Garde et al. (2013)
	Mohammadalizadehkorde & Weaver, 2018	Bekessy, S.; Samson, K. (2007)
	Salter et al., 2013	McMillan & Dyball (2009); Shephard (2010); Sterling (2004); Tilbury (2004)
Complexity	Butt et al., 2014	
	Filho et al., 2017	
	Finlay & Massey, 2012	
	Mohammadalizadehkorde & Weaver, 2018	Alshuwaikhat, H.M.; Abubakar (2008)
	Perrault & Clark, 2017	
	Salter et al., 2013	Davison, A. (2012)
	Sammalisto et al., 2015	
Context dependence	Fedorov et al., 2018	
	Filho et al., 2017	
	Francis & Moore, 2019	
	Sammalisto et al., 2015	
External regulation	Dagiliūtė & Liobikienė, 2015	
	Fedorov et al., 2018	
	Filho et al., 2017	Reid and Schwab (2006)
	Francis & Moore, 2019	
	Omrcen et al., 2018	
Societal support	Butt et al., 2014	Avery (2005)
	Fedorov et al., 2018	
	Finlay & Massey, 2012	Sustainable Endownments Institute (2011)
	Larrán Jorge et al., 2015	Lang (2011); Shriberg (2002)
	Mohammadalizadehkorde & Weaver, 2018	
Meso		
Communication	Butt et al., 2014	
	Dagiliūtė & Liobikienė, 2015	
	Larrán Jorge et al., 2015	
	Perrault & Clark, 2017	
Stakeholder engagement	Butt et al., 2014	
	Dagiliūtė & Liobikienė, 2015	Brinkhurst et al. (2011); Cortese (2003)
	Fedorov et al., 2018	
	Filho et al., 2017	Ferreira et al. (2006); Aleixo et al. (2017)
	Finlay & Massey, 2012	Lozano (2006)
	Larrán Jorge et al., 2015	Lozano (2006); Nicolaides (2006); Velazquez et al. (2005)
	Salter et al., 2013	Gabriel, Fineman & Sims (2000)
	Srikun, 2018	
Micro		
Data	Dagiliūtė & Liobikienė, 2015	
	Fedorov et al., 2018	E. Patarakin, S. Shustov (2013)
	Srikun, 2018	
Inertia	Filho et al., 2017	Brandli et al. (2015); Garvin (1993)
	Finlay & Massey, 2012	Nicolaides, (2006); Thomas (2004)

	Larrán Jorge et al., 2015	Nicolaides (2006)
	Salter et al., 2013	Pennington (2003)
Knowledge	Dagiliūtė & Liobikienė, 2015	
	Filho et al., 2017	
	Finlay & Massey, 2012	Thomas (2004); Nicolaides (2006)
Leadership	Butt et al., 2014	
	Filho et al., 2017	
	Larrán Jorge et al., 2015	
	Ramos et al., 2015	Blok et al. (2015)
	Sammalisto et al., 2015	
Resources	Fedorov et al., 2018	
	Filho et al., 2017	Dahle and Neumayer (2001); Brandli et al. (2015)
	Finlay & Massey, 2012	
	Larrán Jorge et al., 2015	
	Mohammadalizadehkorde & Weaver, 2018	Elliott, H.; Wright, T. (2013); Viebahn, P. (2002); Fatih, B. (2015)
	Salter et al., 2013	Pharo et al. (2012); Thomas & Nicita (2002)
	Sammalisto et al., 2015	
University governance	Dagiliūtė & Liobikienė, 2015	Davis et al. (2003); Velazquez et al. (2005); Lee et al. (2013)
	Filho et al., 2017	Hoover and Harder (2015); Velazquez et al. (2005); Sharp (2002)
	Finlay & Massey, 2012	Shriberg and Tallent (2007)
	Mohammadalizadehkorde & Weaver, 2018	Bekessy, S.; Samson, K.; Clarkson, R. (2007)
	Ramos et al., 2015	Denman (2009); Ferrer-Balas et al. (2009); Koester et al. (2006)
	Salter et al., 2013	Pennington (2003)

Appendix 2: Interview guides

a) Interviews with Environmental Manager / Sustainability Forum

Introductory questions

- Could you introduce me to your function and responsibility at Lund university?

Obstacles

- I'm interested in the decision-making power at LU regarding sustainability. *show organigram* Sustainability matters are not explicitly represented on this image, could you draw for me the relevant sustainability decision makers at LU and how they are related to each other and the actors represented on the organigram?
- Where on the image is the decision-making power regarding issues of sustainability?
- Where on the image you have edited is the knowledge about sustainability?
- Through which formal way are the people in charge of making decisions on sustainable policy at the university informed about scientific research that might inform their policy?
- Tell me about the process from awareness about a sustainability issue at the university, to a decision of doing something about it, to implementation of new policy to resolve the issue? Can you illustrate this with an example?
- Following what we have discussed so far, do you see any obstacles that would hamper the implementation of sustainable policy at the university?
- Tell me about the decision-making process/power structure behind decisions regarding management of academic staff traveling? Can you show me on the diagram how these decisions get made?
- Given the process you just described, do you see any obstacles that would hamper the implementation of measures to decrease academic flying by university staff?
- Business travel is one of the services that has been procured and procurements are one of the categories in the university's environmental plan 2017-2019. Why is flying a category on its own in the university's environmental plan?
- What determines the categories of emissions that are measured and / or reported?
- Tell me about the decision-making process/power structure behind decisions regarding management of the canteens on campus, for example LUX, SOL or UB1? Can you show me on the diagram how these decisions get made?
- Given the process you just described, do you see any obstacles that would hamper the implementation of measures to decrease meat consumption in canteens on campus?

Nudging

- Are you aware of the concept of 'nudging' or using 'behavioral insights' in policy? (*if respondents are not, give definition of nudging according to Thaler (2008) and explain 'choice architecture'*).
- Do you know of any examples of nudging being used at Lund university to reach more sustainable outcomes? Can you describe them for me?
- What do you think is the potential for nudging to reduce university staff flying? To reduce university campus meat consumption?
- Would the current system of procurements for travel and food allow for the implementation of behavioral insights as a requirement in procurements?

b) Interviews with canteen managers

Introductory questions

- Which services does your company deliver?
- What does your role entail and how long have you been in this role?
- Can you explain how the procurement process with the university works? (process, what is included, timeframe,...)
- Does the university engage you to make your business more sustainable? If yes, how?
- Does the university communicate about sustainability towards you, or do you towards them?

Meat consumption

- Do you think it would be a good thing if more people reduce their meat consumption and why?
- Are there any obstacles for you to encourage a reduced meat consumption through your operations?
- Is it important for you to offer a non-vegetarian dish?

Price

- What determines pricing exactly, is it set in the procurement?
- Why are meat and veggie option priced the same?
- Do you think making the vegetarian dish cheaper than the dish containing meat will make more people choose it?

Data

- Do you have data on your past sales, more specifically the amount of vegetarian dishes versus dishes containing meat?
- Do you have data on the type and quantity of meat in the dishes that contain meat?
- Would you share all of this data with third parties (ex. g. Researchers or the university management)?

Nudging

- Do you think putting the vegetarian dish on top of the menu will make more people choose it?
- Do you think giving the vegetarian dish a different name will make more people choose it?
- Do you think having an example of the day's vegetarian dish visible to customers will make more people choose it?
- Do you think showing the environmental impact of the different dishes on the menu will make more people choose the vegetarian dish?
- Have you heard of 'behavioral insights' or 'nudging'?

Appendix 3: Informed consent form for participants

Interview for master's thesis by Mathieu Mal for Lund University International Masters' Programme in Environmental Studies and Sustainability Science (LUMES)

Introduction by researcher: the working title of the research is: "Overcoming Obstacles on Lund University's Quest of becoming a Sustainability Champion: a Case Study on the Use of Behavioral Insights" My aim is to find out what organizational obstacles stand in the way of implementing changes for sustainability and which ones seem to be present at Lund University. After depicting this general overview, I would like to narrow things down to one specific area: meat consumption at canteens on campus. The implementation of behavioral insights, or lack thereof, in this field will serve as a case study to illustrate and investigate the obstacles mentioned earlier on.

Consent to take part in research described above:

- I…… voluntarily agree to participate in this research study.

- I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind.

- I understand that I can withdraw permission to use data from my interview within two weeks after the interview, in which case the material will be deleted.

- I have had the purpose and nature of the study explained to me in writing and I have had the opportunity to ask questions about the study.

- I understand that I will not benefit directly from participating in this research.

- I agree to my interview being audio-recorded for the sole purpose of being transcribed.

- I understand that extracts from my interview may be quoted in the thesis or related research article.

- I understand that I am entitled to access the information I have provided at any time while it is in storage.

- I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

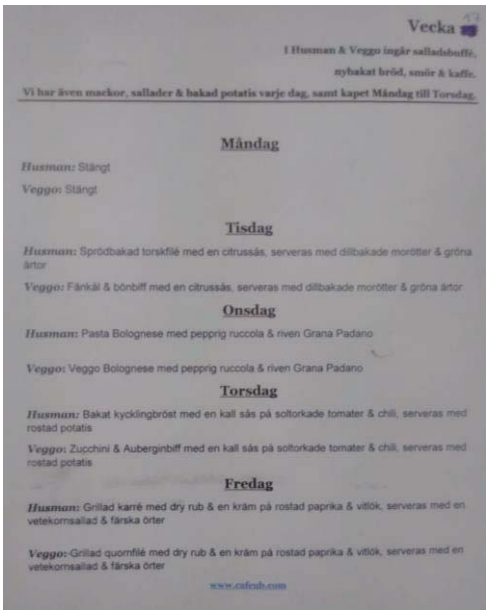
---------- ----------
Signature of participant Date

I believe the participant is giving informed consent to participate in this study

---------- ----------
Signature of researcher Date

Contact: Mathieu Mal, Tel. +32 475 26 83 34, E-mail: ma8662ma-s@student.lu.se

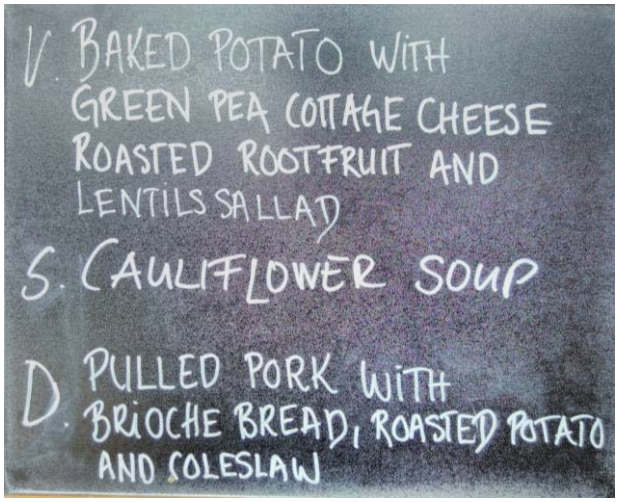
Appendix 4: Pictures of menus of canteens procured by Lund University



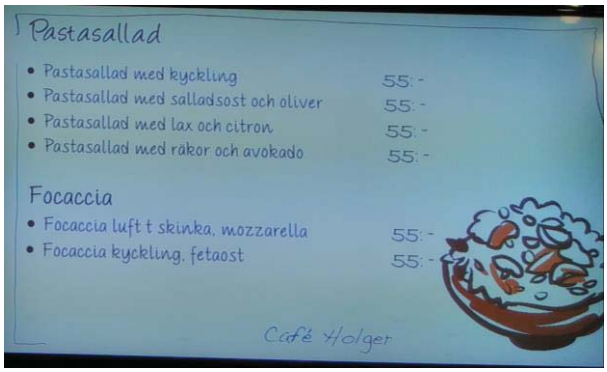

ESTER
MAT & CAFÉ
Veggo Buffé 85:-
Här hittar du allt till:
Frukost, lunch & fika!
Dags för fest?
ESTER for Mersmak
ÖPPET mån – fred 8.00 – 15.30

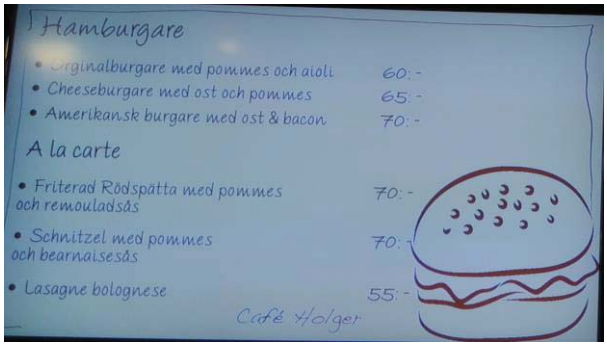

Välkommen till Café LUX
LUNCHEN SERVERAS MELLAN 11:00 - 13:30.
UPPVISA GILTIGT STUDENTLEG OCH FÅ RABATT!
Ⓖ = INNEHÅLLER GLUTEN / Ⓛ = INNEHÅLLER LAKTOS
PASTA CARBONARA M. BACON & RUCCOLA 72:-
PARMESAN- & SPENATPAJ M. ITALIENSK SALLAD 69:-
69:-
AÇAÍ BOWL (VEGAN) 69:-

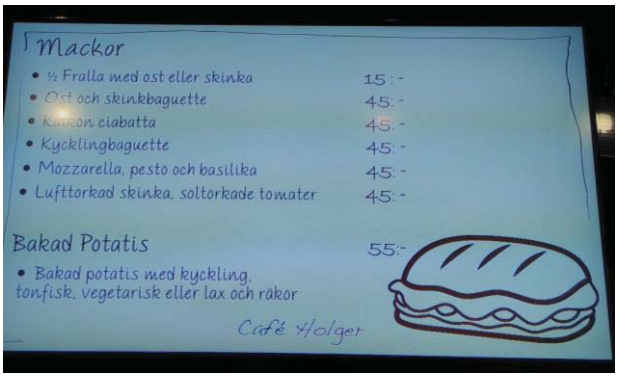

ÄTA HÄR
TAKE AWAY
Meny
DAGENS 72:-
VEGETARISK 72:-
STUDENT 63:-
BAKAD POTATIS 63:-
GF = Glutenfri
LF = Laktosfri


V. BAKED POTATO WITH GREEN PEA COTTAGE CHEESE ROASTED ROOTFRUIT AND LENTILS SALLAD
S. CAULIFLOWER SOUP
D. PULLED PORK WITH BRIOCHE BREAD, ROASTED POTATO AND COLESLAW


SALLAD
LAX
med varmrökt lax, dill- och
västerbottencréme, picklad gurka
med chili samt dillmorot.
RÄKOR
med skagenröra på handskalade
räkor, chili, dill samt rödlök.
KYCKLING
med tomatpesto och jalapeno/majs-
majonnäs samt rostad lök
VEGETARISK
med rödbetshummus, fetaost, persilje-
majonnäs samt rostad mandel.
SERVERAS MED
• QUINOA / MATVETE


Pastasallad
• Pastasallad med kyckling 55:-
• Pastasallad med salladsost och oliver 55:-
• Pastasallad med lax och citron 55:-
• Pastasallad med räkor och avokado 55:-
Focaccia
• Focaccia luft t skinka, mozzarella 55:-
• Focaccia kyckling, fetaost 55:-
Café Holger


Hamburgare
• Orginalburgare med pommes och aioli 60:-
• Cheeseburgare med ost och pommes 65:-
• Amerikansk burgare med ost & bacon 70:-
A la carte
• Friterad Rödspätta med pommes och remouladsås 70:-
• Schnitzel med pommes och bearnaisesås 70:-
• Lasagne bolognese 55:-
Café Holger


Mackor
• ½ Fralla med ost eller skinka 15:-
• Ost och skinkbaguette 45:-
• Kalkon ciabatta 45:-
• Kycklingbaguette 45:-
• Mozzarella, pesto och basilika 45:-
• Lufttorkad skinka, soltorkade tomater 45:-
Bakad Potatis 55:-
• Bakad potatis med kyckling, tonfisk, vegetarisk eller lax och räkor
Café Holger

Appendix 5: Comparison of obstacles in Leal Filho et al. (2017) and in this paper

Image showing the obstacles listed in Leal Filho et al., 2017 (Leal Filho et al., 2017) and table comparing the categories to those developed in this paper.

	Terms obtained from content analysis	Categories of obstacles
1	Lack of long-term planning; lack of plans for sustainable development; plans with no focus on sustainability; lack of institutional agenda for sustainability	Planning and focus
2	Lack of an efficient environmental committee; lack of a dynamic environmental official campus organisation; lack of environmental management policies adopted at the institution	Environmental committee
3	More general resistance to change ('but that's how we've always done it'.); people do not like change and do not understand the term 'sustainability'	Resistance to changes in behaviour
4	They may agree in adopting changes, but continuity is needed; applicability in our setting!; 'my assumption is, potential donors seem to be on a different footing with our situation […] we seem to find studying issues as dictated by potential donors abroad irrelevant to our setting'	Applicability and continuity
5	Lack of policies and lack of institutional commitments; most people are not aware of the need of having practices of sustainability-related innovation in universities	Commitment towards innovation and sustainability
6	Lack of training among professors, staff and students; persuading traditional workers and planners to consider sustainable practices when it is not part of their background or training	Training and collaboration
7	The wrong focus on more innovative/sustainable technology, while neglecting the bigger picture of 'behavioural change' and promoting the 'culture' of sustainable living; the segmentation of the university is another aspect which makes it difficult to pursue a whole institution approach in the field of sustainability, as members of different departments tend to be focused on their particular area and consequently are not receptive to holistic approaches	Culture and conservatism
8	Policy and institutional orientation in the linear logic of basic research and innovation lacking coherence for transformative research and education	Research and development
9	Lack of policies and lack of commitment from administrations; lack of awareness and concern; lack of consciousness of the issues and risks involved	Levels of awareness and concern
10	Better environmental impact; lack of sustainable buildings; financial constraints and ignorance about sustainability matters that, for example, prevent motion sensor lights from being installed in new and old buildings; 'sometimes lack of financial resources to develop a research centred on sustainability in Galapagos'	Building
11	Lack of support and support from the administration; lack of support from administration and senior management teams; lack of technology resources	Administration
12	Need for techno economic analysis; lack of systems for innovative technologies that can be implemented in communities and make a difference on the ground; this requires integrating research with entrepreneurship with local realities	Technology
13	In research, the main barrier is the need for inter- and transdisciplinary research platforms and their financing. Funding agencies tend to support more focused, single-topic research approaches. In education, here I find some reluctance to include explicitly sustainability-relevant contents in courses.	Integration of teaching, research and extension
14	The differences between academic and administrative staff are particularly visible in regard to the academic freedom of researchers and the university administration, which tends to be more regulated and thus can lead to specific and complex steering problems; communication between the different areas.	Dialogue
15	The second one characterised by faculty members that are more worried about salary, job stability and graduate programme ranking than educate/research; students that are more worried about titles than learning; owners more worried about profit than education. Therefore, the whole system is more worried about the ends than the means.	Institutional barriers
16	Lack of funding/investment in new programmes; lack of niches for innovative – weak recognition of transdisciplinarity; lack of financial resources and a mentality oriented to innovation	Incentives for innovation
17	To combine research and practice: 'provide our campus as a living laboratory for sustainability'	Practice and policies
18	Inter-departmental arguments over control of existing resources; operations staff face stiff pressure to keep all systems running all the time, meaning that new technology or processes are viewed sceptically	Support for the introduction of control systems
19	Bureaucracy and working for the wrong reasons. ….. is characterised by the large amount of paper work and middleman's necessary to have the job done	Restrictions and bureaucracy
20	Perception that sustainability is just recycling or turning off the lights; lack of understanding of the larger imperative; the main barriers are the questions the inclusion of environmental education and sustainable democracy	Knowledge and education
21	Lack of capacity for decision; lack of focus and decisions about environmental policies	Capacity and decision-making
22	In my case, the absence of public–private collaboration; the viabilisation of the integration between the company and the university, in activities of applied research of professional and scientific technical character	Entrepreneurship and public–private partnerships
23	Lack of relationship between universities; lack of social projects with the external community; Lack of relationship with the city; not real existent of collaboration and partnerships with others universities from develop countries.	Social barriers
24	Funding from the government; lack of government incentives and support; administrative and governance barriers, lack of relationship between leaders and staff; the main barriers encountered are lack of funds and government support for the practice of sustainability-related innovation in universities	Government barriers
25	A dynamic environmental officer at my campus; no adopted environmental management policy at the institution; lack of norms and habits	Legislation and guidelines

Obstacle in Cogwheel Framework	Obstacle (number from above image) in Leal Filho et al. (2017)
Competition and growth	Not mentioned
Complexity	3, 7, 20
Context dependence	4
External regulation	24
Societal support	Not mentioned
Communication	14, 17
Stakeholder engagement	12, 15, 22, 23, 24
Data	Not mentioned
Inertia	18, 19
Knowledge	3, 5, 6, 7, 9, 10, 20
Leadership	1, 9, 11, 21, 25
Resources	10, 11, 24
University governance	2, 5, 7, 17, 18, 19, 21, 25
Obstacles in Leal Filho et al. (2017) that only affect research and education: 8, 13, 16	