# From seed to seed - cultivating future alternatives

## Exploring the cultivation and organising of seed saving practices

Cornelia Altgård

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Swedish University of Agricultural Sciences, SLU
Faculty of Landscape Architecture, Horticulture and Crop Production Science (LTC)
Department of Biosystems and Technology
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| **Supervisor:** | Cristían Alarcón Ferari, SLU, Department of Urban and Rural Development |
| **Assistant supervisor:** | Jonas Bååth, SLU, Department of People and Society |
| **Examiner:** | Lisa Blix Germundsson, SLU, Department of People and Society |
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**Swedish University of Agricultural Sciences**
Faculty of Landscape Architecture, Horticulture and Crop Production Sciences
Department  Biosystems ad technology

# Foreword

Where do the seeds come from?

It is quite natural as a food grower to gain an interest in seed as you, intentionally or unintentionally, cultivate them. To get your head around that some varieties have been carried down from generations and still exist today is to me mindboggling. Even more mindboggling is the thought and realisation of how many varieties and stories that have been lost due to effectivised and industrialised agriculture. Especially in a country like Sweden.

This thesis has been conducted due to my own long-term interest in seeds. My journey with seeds started already in 2014, when I wrote my BSc dissertation on the potential of the seed bank at the Royal Botanic Gardens in Edinburgh where I carried out my horticultural studies.

I then had the joy to learn hands on about seed saving and small-scale farming in England by a dedicated farm manager, which sparked my interest in a more agroecological manner and allowed me to gain lived experience of agroecology, without knowing the term at the time. Having met and worked with these, and many other passionate and skilled people in the UK is what drew me to study the MSc in agroecology at SLU.

Whilst I had a lot of practical plant and food growing knowledge, my time at SLU has allowed me to understand the wider systems surrounding agriculture and food systems, and that effectively, everything is interconnected. When time came to choose a topic for the thesis, I saw the opportunity to explore what agroecological action was taking place in Sweden, focusing on seed saving. Delving into this field has allowed me to use tools and mindsets learnt over the years as an agroecology student.

I would like to thank all the participants of the study that gave me their time, thoughts and shared their experience in relation to seed saving with me. You are all of great inspiration and it was humbling to hear about your engagement and dedication.

I would also like to thank my two supervisors Jonas and Cristían for supporting the idea and process of this thesis. And a last thank you to family, friends and colleagues who has supported me throughout.

Thank you.

## Abstract

Seeds are an intrinsic part of our cultural and agricultural heritage and has been saved and cultivated for generations. Today farmers and food growers across the world have lost the practice and surrounding knowledge of seed saving due to the industrialisation and commodification of agriculture. In particular in the global north where this process began and is more prevalent. As a reaction, a seed sovereignty movement, spearheaded by La Via Campesina (LVC), a global coalition, has led campaigns and worked for the access and right to seeds. In countries where there is no such organisation or where seed saving culture has fallen out of the majority's shared memory, less is known about the extent of the seed saving, how it is carried out and organised.

The phenomenon of seed saving and its related culture and organisation, has been explored as a Multi Sited Ethnographic Study to be able to find the scattered communities and individuals working with seeds. It has been applied as a case study, to explore the situation in Sweden. Sweden, as here, little information is publicly available on the extent and organisation of seed saving.

To make sense of the empirical data the theory Communities of Practice(CoP) has been applied. This theory has allowed for understanding the communities and the domain of seed saving, how and why, people engage in the practice and how a culture is created. CoP also allows for understanding the wider context and world that the communities act within and is a reaction to. Field visits, semi structured interviews and collected material has been gathered as an observer-participant by the researcher.

The analysis presents an overview of the domain of seed saving, the main actors and communities that act within it. The analysis and result offer an understanding of the specific context of Sweden that has motivated the participants of the domain to engage in a practice. It states that there is not a united organisation of seed savers, instead there is a multitude of CoP's, all working towards seed sovereignty for varied reasons.

Their practices are wide, diverse and mirror the agroecological landscape. In relation to the seeds, diverse types of plants and crops are included, old varieties and those suitable for Swedish climate and changing food habits. In relation to practices: farmers, researchers, hobby growers, artists, scientists, consultants are among the included perspectives. The commercial sector and grassroots perspective are represented, as are science-based solutions together with artistic and more intuitive practices.

This study is significant as it attempts to map and understand the wider domain of seed saving practice, which has not (knowingly) been done previously. Neither in Sweden or found in the literature, where other studies focus on a specific actor or community within the domain. The analysis of the future that participants wish for suggests that there is potential for seed sovereignty to gain momentum.



Key words: Seed saving, Seed sovereignty, agroecology, Communities of Practice

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# Abbreviations

| | |
|---|---|
| BoA | Board of Agriculture (Jordbruksverket) |
| CoP | Communities of Practice |
| DUS | Distinct, Unique and Stable |
| ECVC | European Coordination Via Campesina |
| FAO | Food and Agriculture Organization |
| IPES | International Panel of Experts on Sustainable Food Systems |
| ITPGRFA | International Treaty on Plant Genetic Resources for Food and Agriculture |
| OPS | Open Pollinated Seed |
| POM | Program för Odlad Mångfald - Programme for cultivated diversity |
| UN | Unted Nations |
| UNDROP | United Nations Declaration on the Rights of Peasant farmers |
| UPOV | International Union for the Protection of New Varieties of Plants |

# 1. Introduction

"*One thing you realise when farming like this is the importance the seeds play, they have a very central role to finding the solutions*" – farmer and member of grain association.

Across the globe the majority of agricultural communities rely on seeds in one form or another[1], as they are fundamental for crop cultivation. Agricultural communities, and in extension all of society, are facing several serious challenges: unpredictable changing climate and weather due to global warming, chronic stresses on agroecosystems, water access, soil degradation and sustaining a living countryside (Kliem & Glotzbach, 2022). Part of the solution to many of these challenges include seeds, and access to them. Ranging between the largest multinational agribusiness down to the local smallholder, every farming enterprise relies on seed access in one way or another, to thrive. Since humans began to practice agriculture, seeds have carefully been selected and kept from one season to the next. Seeds have provided the material aspects and potential to grow food as well as providing fuel, fibre, feed and pharmaceuticals (Mulvany 2021, Sievers-Glotzbach & Christinick 2021). The seeds of today are the result of thousands of years of coevolution between the plant, the environment and the humans that have cared and tended to them (Agroecology Europe, 2021). However, since the introduction of genetically modified seeds and industrial agriculture, this is no longer the case.

Historically seeds have been shared and traded under collective governance as a common, which can be described as a natural and cultural resource accessible to all members of a society (Kliem-Glotzbach, 2022). Or to be more precise, as multiple commons, including the physical seeds, the associated knowledge and the surrounding culture (Sievers-Glotzbach & Christinick, 2020).

However, the rapid privatisation, commodification and commercialization of seeds during the last century has limited the ability and tendency to treat them as commons. Instead, seeds have become commodities on the global market. The trend is prevalent in the global North where much of the commodification began, however this trend has since been pushed and spread to the global south (Pescard & Raderia, 2020, Kliem & Sievers-Glotzbach, 2022). This change has made the seed trade a lucrative industry where farmers have little access to seeds other than through the large multinational conglomerate companies. Consequently, farmers have no opportunity, or knowledge of how to cultivate seeds. Moreover, some seeds from these companies have been developed, with genetic modification, to produce

[1] Not all cultures and communities rely on cultivation of crops, there are other traditional ways of sustaining community (Sonjasdotter, 2024)

infertile or defunct seeds. Currently, only three multinational companies (many from the agrochemical industry), serve somewhere between 50-75% of the global seed market: Bayer (including Monsanto), ChemChina (including Syngenta) and Dupont (including Dow) (OECD, 2018, Pedersen, 2020, Howard, 2023). In addition, the strong lobby of these multinational conglomerates have used laws, once put in place to ensure safe and stable seeds to farmers, to gain power and ownership over the previously commonly accessible resource and made it into a commodity for the market[2] (Kliem and Glotzbach, 2022).

According to a report on agroecological seed markets produced for the Act Alliance, the biggest threat to seeds as commons is posed by commercial seed systems, biotechnology regulations, intellectual property rights. Such as the International Union for the Protection of New Varieties of Plants (UPOV) and organisations such as the World Trade Organisation (Ulmer et al, 2020). An argument that is echoed by a range of organisation and researchers (Peschard & Randeria, 2020, Howard 2015, Sievers and Glotzbach 2022, OECD, 2018, Nyeléni, 2016, Sonjasdotter, 2024).

It is difficult to find exact statistics and data on seed production. An example, relevant for the thesis, is the study commissioned by the Green coalition of the EU parliament in 2014 showing that 95% of the EU vegetable seed market is controlled by five companies. There is little transparency in the sector, so further details are hard to come by (Mammana, 2014). It is problematic that there are no independent figures that offer further knowledge about how the multinational industrial seed companies shape and influence the development of and access to seeds. The EU is entangled in the complex and bureaucratic system surrounding seeds which makes transparency difficult. The traditional system where farmers have carried out all the steps of the cyclical process from seed to seed is today carried out by multiple contractors, in multiple countries in a complex web (Almekind and Louwaars, 2003).

A key reason for problematising the dominance of a small number of multinational industrial companies for the provision of seeds is their tendency to decrease and hinder agro- and biodiversity. It is estimated that since the 1900's, 75% of plant genetic diversity and 90% of crop varieties (agrodiversity) have been lost (FAO, 2004, IPES 2019). This loss of agrobiodiversity is considered a major threat to future agricultural production and is prevalent among both cultivated and wild species (Kliem & Sievers-Glotzbach, 2022). This results in a negative impact on the resilience within all the natural ecosystems (due to less diversity, both

[2] There are two seed 'systems'. The informal system produces Open Pollinated Seeds (OPS), cultivated by farmers for generations. The formal system produces "improved" lab bred, hybrid seeds that need purchasing each season along with suggested supplements (Pedersen 2020). The latter is prevalent in countries with industrialised agriculture, where the know-how and ability to produce seed has been delegated to seed corporations and governments (Ch 3.2 Pimbert & Nishikawa, 2022).

genetically and the number of species) that sustain both humans and our co-inhabitants of the planet (IPBES 2021).

As a response to the commodification of seeds there has been a mobilisation of seed activists both locally and globally fighting to keep the right to seeds in the hands of farmers and against seed enclosures and privatisation (Pescard & Randeria, 2020, ECVC, 2021).

The organisation La Via Campesina (LVC), an international movement for peasants, landless workers, indigenous people, pastoralists, fishers, migrant farmworkers, small and medium-size farmers, rural women and youth, are fronting the struggle for food and seed sovereignty (Nyeleni, 2015). According to LVC, and the agroecology movement at large, to enable the creation of resilient food systems, it is required that there be access and legal possibilities for farmers and growers to use commons orientated seed[3], also known as peasant seeds. Peasant seeds are a key part of the 13 principles of agroecology as without access to seeds, there cannot be a just transition of our food system (ACT Alliance, 2021).

The issue of seed access has resulted in international action to support and protect farmers' access to seed.

The first one is the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) which recognises the rights of farmers in relation to genetic resources and related knowledge, adopted in 2004 by 153 parties, including the EU.

The second is the United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas (UNDROP) which was adopted in 2018 by the UN's Human Rights Council. It recognises the importance of access to seeds and offers support and recognition of the work carried out by seed savers (ECVC, 2021, Arche Noah, 2023, UN, 2018), who often, in the words of Phillips (p170, 2013) "*go unseen, unrecognised, unvalued and unsupported*". Unfortunately, these two acts are not legally binding which ultimately offers uncertain protection and support for seed growers worldwide.

As for the challenges facing agricultural communities, in an uncertain climate and geopolitical future, resilient, climate adapted seeds and domestic production is an obvious part of the solution. For these seeds to materialise, promoting agroecology and means of seed sharing and organising around it is vital.

It is not easy to gain full overview of the seed industry as it is not very transparent, which is explored in this chapter. Little is also known about the informal systems that are cultivating commons orientated seed, OPS. The role of seed production and breeding for building resilient systems is not researched or

[3] These are a part of a common heritage, owned by no one but the responsibility of everyone, free from proprietary rights. Grown in situ which allows for continuous adaptation to the local conditions and continuously evolving. The seeds come with a peasant history and know-how (Agroecology Europe, 2021).

well-known (Kliem and Sievers Glotzbach, 2022 ). However, it would be of value to understand more about these alternative seed systems, how they are organised and operate in order to show the value and importance of them. Especially in those countries and places where LVC has no stronghold to support such a movement.

The aspects related to seed saving, breeding and production are wide and diverse, and they are a vital part of a living culture, countryside and a healthy, diverse and just food system. For these reasons, it is of great value for all nations to understand how, and if their seed heritage is cared for, cultivated and tended to. For the agroecological movement to grow a key challenge is to develop networks and infrastructure for seed sharing and production.

A key challenge for promoting agroecology is thus to develop means of seed sharing and organising a wider movement.

## 1.1 Aim of the study and research question

The introduction emphasised the significant role seeds (including the surrounding knowledge and culture) hold in creating sustainable, agroecological, food systems. This study aims, with an agroecological lens, to investigate the organisation and culture of seed saving communities, especially in those places where there is no agroecology or seed sovereignty movement to lead it and is therefore not organised or well understood.

The thesis presents the following research question:
***How is the practice of seed saving cultivated and organised?***

To find an answer to the research question the study addresses the following four steps:

1. Define the actors and active communities that engage with seed saving practices.
2. Investigate how the defined actors organise around seed saving and why they chose to do so.
3. Identify how knowledge is generated, cultivated and passed on.
4. Inquire how organisation of the defined communities and actors might evolve by investigating their challenges and potentials.

### 1.1.1 Research design/operationalisation

The study is qualitative and iterative in its nature. The four steps will help to build and define the phenomenon, *seed saving practice*, which will frame and enable the data collection. Prior to the data collection, further framing is needed, therefore a case study approach has been adopted, focusing on seed savers in one country, which is the focus of chapter two.

The second focus of chapter two is the agroecological perspective which has been a lens through which to follow the phenomenon around a set geographical location. To analyse the data, the theory of Communities of Practice was chosen. Or to be more precise, two frameworks from the theory: The *duality of meaning* and *characteristics of practice*. The terminology of this theory will be applied throughout the thesis to define the communities and actors and will be described in chapter three.

The method of data-collection has been a multi-sited ethnographic study (MSES). As the seed savers and their lived experience were the focus of the study, and their locations were unknown, this method was fitting and is described in chapter four.

The physical aspects of the phenomenon have been important to capture, therefore a bricolage[4] inspired search method has been used to get a deeper understanding of the domain.

The analysis is inspired by Smith et al (2009) methodology for Interpretative Phenomenological Analysis. This method has allowed for a rich understanding of the lived experience of the participants and their understanding of the seed saving domain.

The analysis and results are presented together in chapter five. The two chapters (usually presented separately) of results and analysis (usually presented in the discussion) have been combined following the advice or Braun and Clarke (2025) as this suited the nature of the study.

Chapter six offers a condensed summary of the analysis in the light of the research question. Finally, chapter seven presents the wider conclusions of the study in relation to the wider context of seed saving in relation to agroecology.

Other studies on seed communities using MSES such as Ainstara (2011) and Phillips (2013) have been of inspiration, when designing the study.

[4] The bricolage approach uses multiple methods and empirical materials to collect data that allows for understanding the different perspectives, richness and complexity of a phenomenon. According to Denzin and Lincoln (2011) it is a strategy that can add rigor, breadth, complexity depth.

# 2. Background

Agroecology is the foundation which this study rests upon and is used as a lens through which to view the landscape of seed savers. In short, agroecology can be described as the design and management of the ecology of food systems including social and ecological principles (Francis et al, 2003, Gliessman 2018).

A key defining factor, relevant for this study, is the acknowledgement of everyone's knowledge being considered and valued. Not just modern science but indigenous and traditional knowledge and practice is essential as well as the notion of co-creating knowledge. Local knowledge plays an intrinsic part as solutions can be site specific or local (Pimbert 2009). Out of the 13 principles of agroecology (Agroecology Europe 2021), five will be explored in this study as they are relevant to the case:

- Principle 8: Cocreation of knowledge
- Principle 9: Social values and diets
- Principle 10: Fairness
- Principle 11 Connectivity
- Principle 12: Resource governance

For this study, it is not the seeds themselves that have been the focal point, rather the people (and their practice) who collaborate with seeds and their reasons to do so. The work by Pescard and Randeria (2020, 2021) has been used to understand the history and rise of seed activism and why it was, and is, needed. The research of Mazé et al (2021), Demeulenaere & Piersaand (2020) and Sievers & Glotzbach (2020) focus on organisational dynamics, models of collective action and governance of seeds. This has served to further the understanding of the forms of organisation to look out for during the data collection and as to how and why people engage in the seed saving practice.

As for more specific case studies, previous research in the field of seed exchange networks and seed movements have been of great inspiration for the case of Sweden, to mention a few: Phillips study of Canadian seed saver networks (2013), Pautasso et al's study on seed exchange farmers networks for land races (2013), Aistara's comparison of the seed sovereignty movements in Latvia and Costa Rica (2011) and Da Vía's study on peasant grassroot networks in rural Europe (2022). With their research they are highlighting distinct aspects of the organisation surrounding seed savers and simultaneously the significant role of the seed savers and their actions. All of these explore organised networks of seed savers.

## 2.1 Seed sovereignty

Farmers' access and right to seeds are key concepts in agroecology and the food sovereignty movement. (Nyeleni, 2015). Seed sovereignty is recognized as

essential in the move towards sustaining the global population with sustainably grown food (Lammerts van Bueren, 2018).

Four core principles of care established by Sievers-Glotzbach et al (2020), defining the culture surrounding agroecological seeds have been used as a parameters for finding the participants of the study:

1. Collective responsibility - From an agroecological and commons perspective, there are no owners, only custodians of the seeds.
2. Protection from private enclosure – The rights to seed and their genetic material cannot be owned or copyrighted, they are a natural common and can be used and traded by anyone.
3. Collective, polycentric management – The management of seeds is a shared custodianship, maintained by a multitude of actors.
4. Sharing of formal and practical knowledge – Seed saving is not a practice without the surrounding knowledge.

These principles are shared, explicitly or implicitly by those that are included in this study. The seeds of those that abide by these principles of care, mirror the agroecological foodscape, consisting of vegetables, cereals, fruit, other field crops and flowers sown as part of agricultural systems (Agroecology Europe, 2021). As a result, everything ranging between annuals, biennials and perennials which include both cultivated, reared and wild species are included.

This diverse crop range increases agrobiodiversity which can change consumption patterns and offer greater diversity in fields and on plates, to the benefit of ecosystems as well as farmers and consumers.

There are multiple terms for seeds from the commons[5]. For a more practical understanding of what type of seeds that are relevant for the agroecological context, and this study, the following definitions are relevant:

- Open pollinated seed (OPS): These seeds are more likely to withstand and adapt to instabilities in the face of climate change leading to crops more suited for their environment. They dissolve highly concentrated market structures as they offer control back to the farmers through access to appropriate seed (Kliem & Sievers, 2022, Sievers & Christinick 2020).
- Heterogeneous seed: This type of seeds counteract the global decline of seed genetic diversity and can be used to develop resistance against pathogens and other potential threats, which in turn can lead to less external inputs and costs for farmers (Sonjasdotter, 2024).

[5] Commons seed or seed from the commons refer to seeds that are owned by no one and simultaneously the responsibility of everyone. This thesis uses a range of terms when referring to relevant seeds for agroecological farming, agroecological seed, OPS, peasant seed, commons orientated seed – these are essentially the same type of seed. OPS will be used mainly, but on occasion the other terms will be more suitable.

It is not just the seeds as physical objects that are of relevance, but the entire system that surrounds them and enables their production and use. This includes cultivation, processing, distribution and consumption within the ecosystem including the physical spaces, the resources, infrastructure, institutions, markets, know-how, culture and people (Cabell & Oelofse, 2012).

As mentioned, a goal of the seed sovereignty movement is to take back control and reclaim the right to seeds (Nyeleni 2015). Seed saving and seed sharing have a clear role within the larger agroecology movements, as this chapter has shown. This established organising exists in many of the countries with agroecological movements. Nevertheless, little is known about the organisation of seed savers where there is an absence of such established seed movements. This is a gap that the study seeks to fill. Each of the case studies mentioned earlier, in the introduction of this chapter, portray very different and diverse responses to seed access and the surrounding practices. They also highlight what serious and impactful work that these networks carry out.

This study focuses on Sweden, a country where there is little public support for seed saving and seed sovereignty, both among food growers and the public. The study could potentially shed new light on the organisational methods of seed growers, how they operate and collaborate in the absence of a wider seed sovereignty movement as well as understanding the potential of their practice.

# 3. Theoretical framework

This study aims to achieve an understanding of how participants organise and engage around a specific phenomenon of seed saving. To be able to approach the research question and aims, a theoretical framework was needed that allowed for investigation of learning as a social practice within and across communities. A theory that would allow for understanding of both the practical organisation and the associated aspects of knowledge creation and sharing; hence the choice fell on 'Communities of practice'.

The CoP theory supports the agroecological approach of the study and can enhance the aspects of agroecological principles listed in the introduction of chapter two. To make the study manageable, by defining the research field, as well as making it more tangible, a case study approach has been chosen, with Sweden as the case. A summarised background explaining why Sweden is relevant to explore the research question is found in the latter part of this chapter.

## 3.1 Communities of Practice

Communities of Practice (CoP) is a theory used for examining learning and doing as a process of social participation and sharing. The theory was introduced by social anthropologist Jean Lave and educational theorist Etienne Wenger in their book *Situated learning* which focused on learning theory.

Wenger has since developed the concept further and published *Communities of practice* in 1998, the book which has been used as the main reference for this study. Wenger describes a Community of Practice as "*a group of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly*". In other words, CoP is a relatively new term for something that humans have done for a long time. To understand the CoP theory, a number of key terms are used, described below in table 1. The two concepts that have been applied in the study are the *duality of meaning* and the *characteristics of practice*, described in 3.1.1 and 3.1.2.

*Table 1 Key concepts from the theoretical framework*

| | |
|---|---|
| Domain | The sphere of knowledge that refers to what the community centres around. |
| Community | A group of people who care about the domain and engage in it. A group working towards a mutual goal, over a period of time. There might be different approaches to care about a domain, and this might lead to the existence of multiple communities within the same domain. |

| | |
|---|---|
| Practice | What the community does and learns to be effective in their domain. It connects participants (those active in the practice) to each other in complex and diverse ways such as knowledge sharing, dependence, alliance or competition both in the present and in a historical context[6] which adds meaning and structure to the experience of the participants of a CoP. |
| Broker | individual in a domain that can reach across CoP's and enable collaboration, transfer knowledge and skills. |
| Actor | A unit within a community, or sphere. A company, an association, institution or individual for example. |
| Landscape of practice | A term that encompasses the complex social landscape of communities that involves shared practices, overlaps, connections and encounters. |

### 3.1.1 The duality of meaning

The concept '*the duality of meaning*' has been used for defining the different, distinct communities that engage in seed saving and surrounding culture. It has also been useful for understanding the organisation and culture as well as describing the world in which the participants find themselves and react to in their engagement, as the following section will show.

The concept describes a CoP as an entity consisting of two parts, participation and reification (see figure 1). This framework aids the understanding of the building blocks that form communities within a domain (see table 2).

*Table 2 Building blocks for the duality of meaning*

| | |
|---|---|
| Participation | "C*ombines doing, talking, thinking, feeling and belonging*" in an active social process, and is done with "*our bodies, minds, emotions and social relations*" always reshaping the culture and reified features of the community (Wenger, 1998, p. 56) |
| Reification | Is a form of organising the negotiation of meaning. It is the process of "*making, designing, representing, naming, encoding, describing, perceiving, interpreting, using, reusing, decoding, recasting*" (Wenger 1998, p. 59) |
| Frame | This aspect consists of meaning, experience, world and negotiation. In other words, the situation that the CoP exists in. Built up of the lived experience of the participants, external forces that influence the CoP and what meaning participants find in their engagement |

[6] Seed saving is an ancient craft, and as such has been a CoP for thousands of years which all seed savers today are a part of an extension, which makes the historical context interesting.

The participation suggests action and connection whilst reification suggests the transformation of human properties, relations, processes, actions, concepts, etc. into artefacts that unites the social experience of the community. The artefacts and ideas form a culture that, the longer it exists, shapes actions and behaviours of the participants and vice versa as the participation shapes the reified aspects of the culture. But, without participation the artefacts lose their meaning, the two make each other relevant. The two parts are a form of memory, a source of continuity and discontinuity that can shape the evolution of a practice.

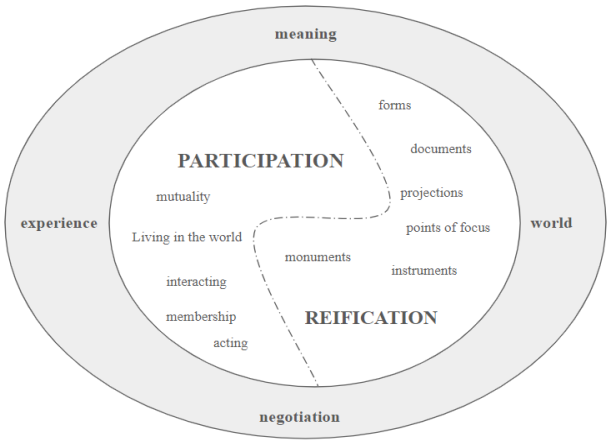


*Figure 1: The Duality of meaning (p63 Wenger, 1998) At the centre is the participation and reification that creates the CoP, and surrounding it (grey area) is the forces that frame participants experience as they respond to these forces*

### 3.1.2 The characteristics of practice

The *characteristics of practice* (see figure 2) has three parts (concepts) that has enabled for understanding of the cultures of each Community of Practice (CoP) and the domain as a whole through analysis of:

- Mutual engagement. The belonging and motivation participants feel through their engagement/work and how they organise in relation to each other.
- Joint enterprise: Their motivation for engagement in relation to external forces and the surrounding world. How the collective work is a constant process of negotiation.
- Shared Repertoire: What creates community coherence (the identity) and how knowledge is shared.

To understand the meaning of the three concepts and how they will be used in relation to the study, short descriptions are given in the following section:

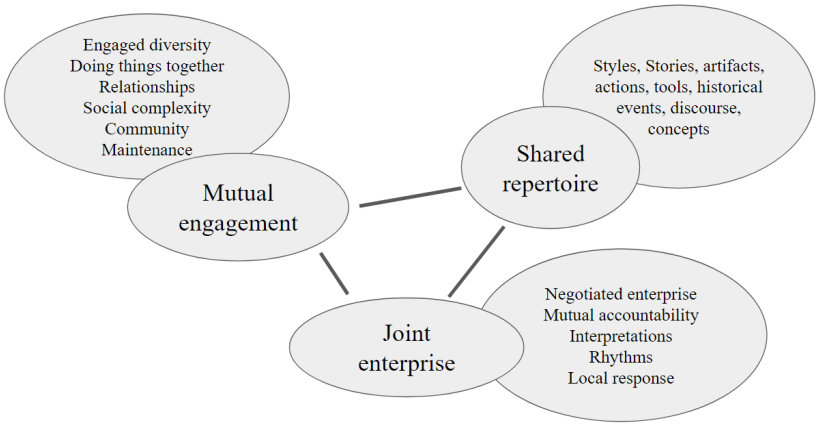


*Figure 2 The characteristics of practice, Wenger 1998 p73*

*Mutual Engagement*

In a community, a shared practice resides at the heart of it, forming relations of mutual engagement between participants. It does not exist in the abstract or in artefacts such as books or tools - it exists due to people engaging with the practice in negotiation with each other. The practice is constantly evolving, but simultaneously, stems from a history of past practices, handed down from previous generations (past shared repertoires).

It allows for feeling belonging which creates coherence that can transform engagement into a CoP. This aspect easily goes unseen and is therefore undervalued. Mutual engagement does not equal homogeneity or agreement among participants but always entails relationship. Disagreements, conflict and tension are, too, part of an engagement. Even though the term community often suggests positive relations.

*Joint enterprise*

This is always a collective process, not a static agreement. This aspect is the response, of the participants, to the wider context in which they find themselves as CoP's are not self-contained entities. They always spring from a larger context and broader system (as depicted in the *duality of meaning*, see figure 1). These can be historical (including longer developments or recent/specific events), cultural, political or social, each with different restraints and resources. The response to these conditions becomes the joint enterprise.

Part of the enterprise is defined by the community and parts are shaped by external forces out of participants control but the response to this is always defined by the community and therefore their own enterprise. Participants' understanding of 'the enterprise' will not be a collective product and does not have to be. Instead, these aspects can highlight the complexity of mutual engagement. This creates

mutual accountability (such as membership rules) and is an integral part of the practice.

Participants learn to find ways of accepting each other's differences in what is of importance and not. Some accountabilities can be reified as rules, standards and policies. It is the enterprise that gives the mix of actions, relations and people a sense of coherence.

*Shared repertoire*

The source of community coherence is the development of a shared repertoire - a resource that portrays what is rehearsed (the history of mutual engagement) but also what is available for future practices. This is the aspect of a CoP that is identity shaping. Routines, knowledge, language, tools, stories, symbols, actions and concepts that the CoP produce or adopt becomes a part of the shared repertoire and contains both reificative and participative aspects. In their isolation they might not mean much but in the light of belonging to a practice or a community pursuing an enterprise they gain value.

## 3.2 Case study: Sweden

To narrow the broad field of the study and apply it to a context, a case study approach was used, chosen in relation to the research question and identified research gap. Phillips (2013) in her book on Canadian seed savers suggests that seed saving, and the culture that surrounds it, is less common in the global north than the south, partly due to the fast and high degree of industrialisation and privatisation in agriculture.

This is the case of Sweden where the agricultural sector quickly grew and modernised in the late 1800´s and throughout the 1900's which led to seed saving quickly falling out of favour. As a country, Sweden quickly adopted the habit of importing seed from the international agricultural industry to strengthen the economy through trade and to offer farmers uniform crops with higher yields. As a result, the tools, machinery and know-how needed for saving seed on a farm scale also fell out of shared memory (Sonjasdotter, 2024, Liljemalm 2020).

As described in the introduction, to the public, there is not much available insights on the commercial seed industry, or existing insights on the production of commons orientated seed in the EU. The situation is the same in Sweden, as this chapter will show.

*Three reasons why seed saving is relevant for the Swedish context*

Firstly, climatic and physical conditions; Sweden spans several climatic zones and the conditions and possibilities for farming differ wildly between the north and the south. This is the reason the country has been exempted from using organic seed for organic farming. There are not enough suitable organic varieties for the growing

conditions, let alone any seed production (Agroax, 2024). Previous solutions to find adapted varieties have been regional breeding stations, developing adapted varieties, but these stations have all been closed (Börjesson, 2020).

Secondly, legal frameworks, as of 1995 Sweden is a member of the EU and follows their legal framework for seeds. These regulations apply to everyone, from commercial farmers to the small hobby growers.

Seed laws were initially enforced to ensure farmers receiving clean, safe and healthy seeds and date back to the 1960's, when the DUS-requirements were introduced. These requirements were to guarantee Distinct, Unique and Stable (DUS) seed which meant that all seeds need registration on the official list of the EU. The DUS-requirements led to many older varieties of crops not being granted registration as they were heterogeneous and therefore unstable as well as too undistinctive. This contradicts the Convention on Biological Diversity and exemptions have therefore been made, allowing certain 'non-commercial' crops/varieties[7] to be kept from registration, so that the agrodiversity in each country can be maintained to some degree. These 'non-commercial' vegetables can therefore be cultivated more freely[8]. Registration of a seed variety is costly and therefore this step imposes an obstacle for smaller actors that wish to sell seed on the market (Ulmer, 2020, Jordbruksverket, 2011).

Thirdly, seed systems; unlike countries where most farmers rely on their own seeds, and therefore have a stronger seed saving culture and relation to seeds[9], Sweden has no clear or unified organisation around seed nor is there any production at large. But seed savers exist, engage and participate through organised associations. Sweden has Scandinavia's oldest seed association set up in 1982 as a response to the lack of seed diversity available at the time (Pedersen, 2020, Liljemalm, 2020). In the late 1990's this was followed by a member led association cultivating the remnants of the Swedish heritage grains (Sonjasdotter, 2024). With the seed laws of the EU, this type of activity is controversial and has at times been illegal (Sonjasdotter, 2024, Runåbergs fröer, 2024).

As for conservation of the Swedish seed heritage, the Swedish gene bank was set up in 1979, focusing on the main agricultural crops. The seed gene bank has its interest in diversity in terms of all the Nordic seed heritage (including wild relatives) and as of 2007 it has been a joint Nordic organisation (Nordgen 2024). The Swedish Board of Agriculture (BoA) and Swedish Agricultural University acted much later than the grassroots community in recognizing the importance of

[7] Amateur varieties are an exemption and can be sold in small quantities, with the specific purpose to be grown on a small scale. Agricultural crops (those grown on field scale) cannot be registered as an amateur variety (the species vary between countries).

[8] Amateur varieties and conservation varieties are two such types of seeds.

[9] Such as the examples in Aistara's study comparing Latvian and Costa Rican seed savers (2011) or Angés ethnographic work on maize, potato and rice (2022)

the national seed heritage, through setting up POM[10] and the project Fröuppropet[11]. In Sweden, seeds available to consumers are almost exclusively produced abroad, often, from an unknown origin.

All the Swedish actors host and care for different OPS seeds, with some overlaps. There is no overarching register that can evaluate the genetic diversity that is harboured in the country as a whole.

The extent of Swedish seed production is not registered in detail and there is no straightforward way to find public data on the Swedish seed market. Due to EU legislation, there is a lack of transparency.

Through email correspondence with BoA's Plant Legislation Unit (email correspondence 30/1/24) information about the number of registered companies producing and selling seeds in Sweden (see table 1) was accessed. This correspondence also informed that there are no statistics on the amount of seed produced in Sweden.

There are figures on the seed sales and the most recent figures, although slightly dated, state that Swedes consumption for hobby growing is increasing, seed sales included (Björkman, 2012). The numbers regarding the origin of imported seeds were inadequate as seeds imported to a European country in bulk and then packaged and rarely have the country of origin of the package.

*Table 3. Registered companies with the BoA selling and producing seed in Sweden (email correspondence with the BoA 30/01/2024)*

| Type of seed | Produce | Sell |
|---|---|---|
| Kitchen garden seed | 15 | 11 |
| Both kitchen garden seed and ornamentals | 5 | 4 |
| Ornamental seed | 11 | 7 |

Statistics on sales of hobby growers saved seed, not requiring registration, is not available. Neither is public information on varieties grown and swapped/sold within the member association available. To conclude, there is no succinct data for neither commercial nor non-profit seed production in Sweden. Not how, how much or what is produced. Overall, there seems to be little information to create an overall picture of the extent of seed saving in the country.

### *Challenges ahead*

There are several challenges in the near future that make domestic seed saving and production relevant, not just to farmers but to the nation. With unpredictable shifts in climate, some of the main global producers of seed are facing challenges

[10] POM - the program for cultivated diversity is Sweden's response to the FAO's Global Plan of Action for Plant Genetic Resources and has been active since 2000 in affiliation with The Nordic gene bank and SLU. They aim to find and maintain the genetic resources of the Swedish plant heritage, both land races and wild relatives.

[11] Fröuppropet was a call out asking the public to send in their Swedish heritage seeds, which resulted in 270 people sending in material.

in their production. This is both an opportunity to develop a Swedish seed production but is also a challenge as seeds adapted to the climate and suitable for commercial agriculture will be required.

Ongoing war in Europe and other parts of the world combined with a precarious political global climate has led to the Swedish government highlighting the importance of preparedness (*beredskap*) in the case of a crisis and more resilience in the food system.

The BoA actively works on how to make Swedish agriculture more resilient (Jordbrukverket, 2023). In the current plans seeds are not on the agenda, even though seeds are on the list of essential primary supplies (Jordbruksverket 2023). A more time specific challenge is the change in seed legislation that will occur in 2037. Organic farmers in Sweden are as of 1998 exempt from using organic seeds due to the northerly growing conditions in Sweden. This exception is ending in 2037. This is an opportunity to develop Swedish seed breeding systems for a diverse number of crops, but investments and research is needed to gain necessary knowledge.

Overall, there is evident proof of seed saving and cultivation of OPS and agroecological seed in Sweden, as this chapter has shown. The challenges mentioned show why these seeds are important for the future and their potential role.

Chapter two discussed international perspectives and examples of seed saving networks, both international and national examples, many as part of organised agroecological movements. Sweden does not have any such movement that join the separate actors.

A research gap reveals itself more clearly here; how are Swedish agroecological seeds and its surrounding knowledge and culture organised? This would allow for greater understanding of how and why people engage in and cultivate OPS. By studying a, yet undefined, domain of seed saving it is possible that the research design can be reapplied to other countries where there is little awareness of the extent of seed saving and its importance.

# 4. Research Methodology

The method chosen to conduct the research for this study are aspects of the method Multi Sited Ethnographic Studies (MSES) (Hammersley & Atkinson, 2007, Marcus 1995). MSES are qualitative and exploratory in nature, which fitted the research question well.

## 4.1 Multi Sited Ethnographic Studies

A MSES is not a method as such but rather a strategy that follows a phenomenon or concept around a multitude of actors/spaces that share a common interest. As the actors and communities engaging with seed saving in Sweden were not mapped or fully known, this was a useful strategy to apply.

The term was first used by Marcus (1995) which state that the multi-sited ethnographers work is to identify systemic realities in local settings. In other words, what is explored is local, but the phenomenon can be global. The phenomenon of seed saving and sharing, a key feature of the international agroecology movement, is explored in the Swedish context.

When following a phenomenon or concept, it is not only the people but also their stories, metaphors and objects (reified material, that themselves might be mobile) that are considered. It is a useful method for exploring the webs occurring between actors, institutions and discourses and how these make sense of each other (Hammersley & Atkinson 2007).

The researcher has an active role, and in this study as observer-participant when in the field. This term is used to emphasise the dual role of the researcher as both active agent, participating in action whilst simultaneously being an observer (Hammersley & Atkinson, 2007).

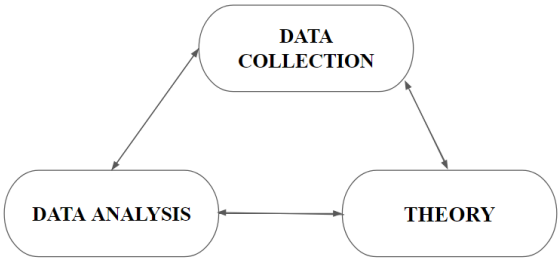


*Figure 3 Triangulation visualised.*

MSES's are based on triangulation, an ongoing process between data collection, data analysis and theory propelling each other forward as information unfolds (Snow 2013, Hammersley & Atkinson, 2007) shown in figure 3. As a result, the theory and framework for the study is based on literature gathered before the fieldwork began which was used as a foundation. Theory and literature continued to be added throughout the data collection period as new ideas and concepts became obvious. The method is nonlinear as a process, where there are several possible outcomes for the study, depending on the triangulation process (Van Duijn, 2019).

As this study was conducted over the space of a year, part-time, instead of the usual one semester, more time was allowed for the propelling of the case.

## 4.2 Sampling approach

To capture the scattered communities working with seeds, participants and places were selected based on Maximum Variation Sampling (Patton, 2014). This method is useful in wide research fields; a selection is made to cover an as wide range as possible to represent the potential variety within the field. The selection was made based on four factors.

Firstly, that their work involves seeds that qualify for the study based on the parameters in chapter two, directly or indirectly.

Secondly, that their work aligns with agroecological principles (as defined in chapter 2.1).

Thirdly, to include a wide variety of actors from the field to gain a holistic picture using the maximum variation sampling. This was done by including at least one participant for each identified community to offer multiple perspectives. Both profit and non-profit, rural and urban, online and in the field, hobby- and commercial growers, farmers, gardeners, knowledge sharers/spreaders/creators such as academics, consultants, teachers and campaigners have been included.

Further down the line of the study, artists using seeds in their practice were added to the list. Exemptions were made with three participants that held valuable and relevant perspectives, but did not work with OPS directly:

- A commercial seed company selling non-Swedish seed, as to understand the wider perspective of the organic seed sector
- An agricultural consultant and cofounder of Organic certification, as to understand the long-term perspective of Swedish organic farming.
- An advisor from the BoA as to understand the top-down perspective of the phenomenon of seed saving.

Fourthly, as there is no overview of the Swedish seed savers, convenience sampling in the form of snowballing was applied. The participants in the study were generous with giving advice about people active within the field in one way or another. The participants included in the study were determined by their willingness and availability to partake in the study and had the option to withdraw if they wished to.

### 4.2.1 Sampling limitations and considerations

There has been the intention to collect perspectives from as many domains and perspectives as possible. Almost unanimously the responses upon contact have been positive and responsive but time, schedules and other commitments prevented participation on numerous occasions. The geographical location of the researcher

and possibilities to travel, as well as a lack of sites to visit, has meant that there is a focus on the actors located in the southern parts of Sweden.

## 4.3 Data collection

Collecting empirical data has been done through field work and semi-structured interviews. The aim has been to capture a wide variety of settings to gain an understanding of the varied ways of working with seeds and surrounding knowledge. Some communities were known before the field work began, through internet searches (see chapter 4.3.3).

Others emerged during the collection period. For consistency during the collection period the advice and guidelines for observing and writing field notes, as well as the structuring of the collected data by Van Duijn (2019) and Wolfinger (2002) has been used for reference. Mainly Wolfinger's '*Comprehensive Note taking strategy and knowledge structures'* were employed (2012). Detailed notes and observation are key for all fieldwork and the practice of taking instant notes has been applied. These instant notes have been typed as soon as possible aided by photos taken during the visits.

To record whilst in the field was not always possible due to the lengths of some visits and the weather conditions as well as for making the participants feel more at ease. The 'practical/physical field' has not been as extensive as expected; there was not always a physical space visit, which reshaped the original research design and made it more reliant on interviews. As a result, the data consists of as many interviews over the phone as site visits.

### 4.3.1 Site visits and field work

Sites and events were attended as an active participant-observer when opportunity was given. The intention before the actual field work began was to have an active role during the visits, but most of the participants in the study preferred the setup of study visit and conversation. Participants were contacted via email. In total, nine sites were visited. Five of these were similar to traditional study visits with time for interviews, the other four were occasions for interaction and practical aspects (see Appendix III for detailed information on the sites and participants). Non-systemic field observations have been carried out throughout the data collection period which has furthered the insights of the research field.

Unforeseen at the start of the data collection, conversations, both in the field, but also through scheduled phone calls and random encounters took place which offered important understandings of the phenomenon. For these, the interview guide was used (see Appendix 1), but these conversations did not happen in the same structured and organised manner as the interviews. Therefore, they are listed as field work, instead of interviews. In total three of these conversations have been transcribed through notes and added to the data for the study. Additional

conversations were held with several seed actors at events and places related to seeds. These have not been documented and a part of empirical data as such.

### 4.3.2 Semi structured interviews

Interviews are a common method in qualitative research, since they provide an opportunity to understand participants personal experience and understanding of their world and a phenomenon. More specifically, for this study, semi-structured interviews have been employed. They allow for a more in depth understanding of the beliefs and attitudes of participants due to the flexible approach and open-ended structure (Hammersley & Atkinson, 2007). The semi-structured interviews were conducted as a method for collecting the perspectives from the communities of the study and to get a deeper understanding of their practice, engagement and view of the future. 15 interviews were carried out between January and August 2024, both during field work and over the phone (once via Zoom).

In total, ten recordings were made during interviews, the other five had instant notes taken. For a complete list and information about interviewed participants (see Appendix II). The phone-interviews were carried out as it emerged that many relevant participants did not have sites to visit or were geographically remote, but with perspectives that were deemed important for the study. An interview guide with key questions was produced and has been used for each semi structured interview. The guide can be found in Appendix I. The guide allowed for a structure but also space for asking more specific questions depending on each participant's knowledge and field.

### 4.3.3 Reified material

To find information that would offer a deeper understanding of the phenomenon of seed saving, a structured search practice as conducted with terms such as *fröproduktion Sverige, Svenska fröer, frösparare*. Initially, the local public library and the SLU university library were searched for available information on seed saving in the Swedish context, as well as the internet including major news sites, such as Swedish public service, radio and television To further the understanding, and analysis of, the knowledge sharing within and across CoP's, reified material, both tactile and virtual material has been explored. The reification is referring to the concepts used from Wenger's CoP-theory and includes everything that is produced by the CoP's and is a key part of reinforcing the communities belonging and identity as well as their ability to knowledge share. This material, on seed sharing/saving, produced by the CoP's includes:

- Social media accounts of the participants/actors in the study
- Published and printed books and leaflets on the phenomenon
- Other published material by associations and companies in the study, such as newsletters, seed lists, information leaflets, blogs.

- Websites of the enterprises of the participants/actors in the study
- Podcast by one of the participants that interviews many of the key figures in relation to seed saving in Sweden.

The same materials as mentioned above, produced by actors working with seed but not qualified to be included in the study, were also studied, to gather a wider understanding of the field.

Another aspect of obtaining reified material was to try some of the ways in which the agroecological seeds from the commons can be accessed, as the seeds themselves are perhaps the ultimate reified item of the CoP's. As actors are working in diverse ways and domains, this was one way of understanding how they organise their practice around seed. Seeds were obtained in the following ways:


*Figure 4 Seeds obtained through a member of a seed association.*

- Swapping seeds at seed swap events
- Joining a seed saver association and accessing seeds from other members , see figure 4.
- Buying seeds from an association
- Buying seeds from commercial seed companies.

## 4.4 Data analysis

The data was analysed with an inductive hermeneutical approach. This approach is iterative with the goal to interpret, not to describe. Following the four steps by Smith et al (2009) guide for IPA (Interpretative Phenomenological Analysis), alongside additional advice by Longhorn (2007) the process was conducted.

The initial process (step one) revolves around data immersion, doing several readings of transcripts (interviews and field observations) and listening to recordings. This is followed by a free text analysis (step two), finding key words/sentences that help answer the research question and the aims (through the filter of the CoP theory). These were added to a spreadsheet.

Next is the structuring of the spreadsheet, finding patterns as well as exceptions, looking for connections that become initial themes for each participant/site (step three), and if needed going back to the transcripts and text for reference. From the entire data set, connections and concurrences are identified and clustered into superordinate themes (in relation to the research question and aims through CoP-theory), with quotes and words added for reference. Lastly (step four) is the creation of a master table of themes. During the creation of this, as data is added, new emergent themes, deviations, contradictions and overlaps might become clear.

After this the analysis is written, connecting back with the research question and aims of the study. Chapter five is presented as Analysis, justified with Braun and Clark's (2025) reasoning in regard to qualitative studies. The results were not simply found but have been interpreted by the researcher as well as filtered through the theoretical framework.

## 4.5 Ethical considerations and reflections on the role of the researcher

As for most qualitative research such as ethnographic studies, the role of the researcher needs to be highlighted as all information has been filtered through them, and therefore also their subjective lens. Their background, worldview, prior knowledge and impression on the field of research/participants will affect the collected data. The methodological advice by Van Duijn (2019), Candea (2009) and Flyvberg (2006) has been referenced and considered to create awareness of the invisible presence of the researcher in the data, such as making the process as transparent as possible, being able to trace all the steps of the research and to define the difference between description and interpretation. Hence, adding small statement in the following section:

At times I have been enthusiastic and shown my own interests during interviews and visits as it is difficult to completely set aside my own opinion. Especially when interviewing people that are taking action and are changing our food system, which I find highly inspiring.

Despite my bias for agroecological methods of farming I have attempted to always listen and observe as a researcher collecting data, without colouring it with my own opinion. I have had an open mind, hence including multiple perspective that would diffuse any bias I might have had towards any particular actors.

Names of places and participants have been anonymised in the study, for the sake of the participants as well as naming them serves no purpose for the research. Companies and institutions are not referred to by name but instead as to what type of institution they are to better clarify what communities or roles they represent. As all contact with the participants were held in Swedish it is worth considering the translation of their accounts might have been affected by the translation (carried out by the author of this study). General Data Protection Regulations have been followed in accordance with the SLU guidelines.

# 5. Analysis and results

In this chapter the results of the research are analysed and presented through the theoretical framework of Communities of Practice, with an agroecological perspective. The results and analysis have been combined as it was deemed the most rational way of presentation due to the hermeneutical nature of the study. The guiding question for the study has been how the practice of seed saving is cultivated and organised, especially in those places where there is no seed sovereignty movement to lead it. The following sections, present a result by presenting the answers to the four steps defined in relation to the research question:

5.1 Presents the answer to the first step, a concise summary of the identified communities in Sweden that revolve around seed saving practice of OPS.

5.2-5.4 Presents how and why the identified actors choose to organise around seed saving. How knowledge is generated, cultivated and passed on which the second and third step set to answer.

5.5 Looks at the future. It presents the challenges and potentials that the participants have identified, which is what the fourth step set to answer.

## 5.1 Identified seed saving communities in Sweden

Two of the steps of the study was to identify the actors and communities in the domain of seed saving of OPS and how they organise, which this section considers. The CoP-concept *the duality of meaning* allowed for distinguishing communities within the domain, through looking at the factors practice and reification.

It became clear that there is a diverse way of engaging with OPS. It is of importance to remind the reader that the actors within the community might not be collaborating or even be aware of each other, but they do share a practice. The following communities were identified:

*Commercial seed community:* Consists of small, registered companies with one to ten employees. Three of the companies base their production on a *grower community*. These are groups of growers that produce seed for a central actor but have other main incomes. This is a younger CoP that is still very much developing their identity. There is unofficial knowledge-sharing and collaboration within this community, between both companies and growers. This community sell their seeds to the public, mainly to hobby growers.

*Grassroots/Non-profit seed community:* Consists of several, well established, member run associations, saving "amateur"[12] seed. There are also smaller, local and independent groups that operate within the wider community, including community

[12] This does not mean that it is done without skill, on the contrary, many of these growers are highly skilled and carry invaluable knowledge.

farms and passionate individuals. The associations have created systems within the system to bypass the strict rules and regulations, by not selling the seeds, they swap or sell only to other members and are considered a legal person/entity.

*Educational community:* Places, physical and virtual, where knowledge is generated, shared and gained, independent of each other. Focus varies from knowledge creation to knowledge sharing/exchange and includes the few actors that offer courses in seed saving. It also includes social events, websites, publications with the aim of spreading knowledge.

*Conservation and research community:* These are also non-profit and focus on the Swedish/Nordic seed heritage, where seeds are genetic assets and artefacts. Seeds are saved as a part of conservation work for research and future needs. The gene bank is the main community/actor in this domain but collaborates abroad with other gene banks and actors.

*Political community*: Focus on the legal access to seeds, not the seeds themselves. Focus on laws, policy and legislations that surround them on an EU and national level and to create awareness.

Other actors that are not a community but are important aspects of the domain and for the and CoP's:

*Brokers:* Individuals that work across multiple communities and link them together. Some come from other domains than seed saving but incorporate seed in their work.

*Individual growers/farmers:* Independent actors saving their own seeds and not a part of any organised community.

*Authorities:* Not a community as such but rather an external force (the grey field in figure 1) that affects and interacts with the communities.

They do not work directly with seeds but rather the rules and legislations that surround them, so in a way linked to the political community. In the study it is the BoA that represents this actor.

The CoP's of the domain jointly negotiate and respond to this external force as a part of them negotiating their practice.

The communities of actors and individuals listed above are the parts that make up the domain of seed saving. Each represent a distinct way or role within the domain, which interact and react to each other as well as the world that define/challenge/restrict the domain.

## 5.2 Cultural motivations of the seed sharing communities

This chapter is a continuation of the previous section but shifts the focus from the type of community to the reasons for engaging in a community. The CoP

concept *characteristics of practice* (See figure 2) is applied as it allows for understanding of the shared repertoire of a community, and most relevant for this section, the mutual engagement. The joint enterprise presents how they negotiate their enterprises around external factors and each other.

There are three general themes that, at one point, have sparked all participants' engagement and brought them into the domain of seed saving.

The first one is that they have all realised what vital part seeds play. Something that much of the Swedish population do not even consider, based on the study's structured searches during the initial stages of the research and the lived experience of the participants.

As one consultant, now working with creating a viable commercial seed production on a larger scale, describes it: "*there is a general lack of knowledge among the public, but we had little understanding of the issue ourselves only 10 years ago*". There is the sense that the craft, the trade, the skill of seed saving practice needs continuous cultivation.

The second reoccurring theme and issue, that also frames the study, is the industrial scale of Swedish farming. This is an aspect that frames the whole domain and creates a wider context (the grey field in figure 1). In the words of the consultant from the BoA: "*the problem is that many areas have gone from small scale 100 years ago to being extremely large scale today*".

Small farms have merged into big ones and today there are fewer and fewer small farms. Bigger farms have led to mechanisation and effectivization which has led to seed saving being a forgotten craft today among commercial farming. "Be*cause in a way we have destroyed the system in Sweden, we have to start over again*" as one seed grower and consultant puts it.

This an issue that is brought up by all the participants that discuss political aspects of seed growing and is something that, especially the commercial CoP, are working towards rebuilding. The commercial CoP is a form of joint enterprise, where the actors are working parallel to each other within the same CoP. The grassroots have a different approach; they are not trying to change the system but are creating their own systems within the official one.

For participants of the commercial and grassroots CoP's, the mutual engagement stems from a lack of seed and food that participants wish to see and taking action to make it available which is what becomes the joint enterprise for them. May it be perennial food crops, cultural heritage, heterogeneous adaptable grain or wildflowers, with the shared notion that they are fit for the Swedish climate.

A third theme is the participants' awareness that '*business as usual*' is not the way forward. Climate change, unsustainable food production, and loss of bio-/agrodiversity are among the main identified concerns. For other participants it is a political question: "*No life is stable, everything is in constant development, never uniform. The seed legislation says that all varieties need to be distinct, stable and*

*uniform, but that is not the case in nature. Therefore, it should not be legal to have laws that are against natures laws*" - artist during field trip critiquing the EU Seed laws, in particular the DUS-requirements. This quote highlights the political aspects that are present. In this case more outspoken, but the same sentiment appears often, but more quietly, in the conversations held with participants.

The analysis shows that there are clear motivations for why participants engage in their practice related to seed saving and sharing in Sweden, and are listed below:

*Taking back control from the global seed industry*

"*To have the right to seeds and to use them is a part of the basics for food sovereignty*" - Swedish representative from ECVC. Many of the participants envision a different food system in different ways. For some it is political and for some it's about food sovereignty from a self-sufficiency perspective. But at the core is the right, and access, to open pollinated seeds.

The same sentient is reiterated echoed by the BoA participant, who see the potential of OPS: "*It is really important work because many of the modern varieties are often under some form of patent or hybrid varieties that can't be grown from seed. It is the older varieties that have the potential for taking back control over your own seeds*".

*Participation and Identity*

For the seed savers of the study, the seed growing is a part of their identity. It becomes, as described by one participant, "[...] *a philosophy and approach to life*". Two others say that they will cultivate seeds "[...] *until they fall over in the field*". This is not only regarding the seed saving but the lifestyle of farming and producing food.

There is pride in all the descriptions by participants that work directly with seeds, as they are aware of the importance their role holds and has held through history. Here the longer, historical perspective of the CoP community of seed savers is noticeable as a longer lineage becomes apparent.

Many describe their practice as a craft ranging from hobby growers to the professionals. In addition to the defined communities there are also individuals that are saving seed on a small scale at a very high skill level.

*Political engagement*

The political aspects are an underlying motivation among many of the participants, picked up in conversations and anecdotes but not always visible in reified material of the CoP's.

The three small-scale seed companies of vegetable seeds are all mentioning seed politics in special sections on their websites, but none of the grassroots associations. Most political, but not a seed saver, is the representative of ECVC that describes

their attempts to collaborate with others while struggling to get them to engage. They said "*Everything, in the end, is just a political game, and it is easy to lose your strength if you don't unite in your struggle*" but also understands that "*it can be a sensitive game to make a statement*".

The two artists of the study both raise political points, through the growing of OPS seed as well as hands-on activities open to the public.

*Self-sufficiency*

*"To be able to save seed that is adapted to the local climate, which is free and doesn't have to be bought"* – board member of a seed saving association. This quote is an example of how participants of the study think about seed saving which is a core value of the seed sovereignty movement.

The participant (running a podcast and blog) is the only one, who is not a seed company, that highlight seed saving to engage listeners and followers. They say: "*it seems completely crazy to speak of self-sufficiency and preparedness without mentioning seed saving*".

This quote raises, once more, the issue of lack of general awareness in Sweden of the topic. For the majority of the small-scale seed producers in the study their journey as seed savers began with an interest, a curiosity, of self-sufficiency and this continues to be a part of their practice, and the community's shared repertoire. Here exemplified by the perennial nurseryman and seed grower: "*it began when I started growing food myself, the next step was to begin to question where the seeds came from*". For the non-commercial actors, saving money and the freedom that comes with self-sufficient seed production is a recurring theme, but is also mentioned among commercial actors that grow crops.

*Diversifying what is considered food crops*

An agroecological aspect of changing the food system is creating awareness and possibilities for other crops other than annuals and biennials being the main crops for food production to rely on. There are four actors in the study that work with perennial crops, one example being the productive and seed generating forest garden in figure 6. As one perennial plant nurseryman and seed grower explains: *"we need diversity against climate change, both annuals and perennials, we need a broad base to support us"*.

The perennial cultivation of crops, such as agroforestry and forest gardening, is not very extensive in Sweden yet, but interest is growing according to the participants in the field. The actors that engage with perennial seeds do not focus on the seed access as such (as there are many other ways of propagating perennial material). They do not face as strict regulations as vegetable seed. Instead, they focus on changing the food system by what they offer for cultivation and therefore what becomes available to put on plates and in gardens.

*Cultivated and wild diversity*

Diversity is a motivation for the gene bank and many amateur growers as well as researchers. "*For me it is not so much about the seeds but rather the genetic diversity. So much is contained in that package, seeds are a small part of that, so in that way it is just a coincidence. Seeds are the way that I work with genetic diversity, cultivated diversity is the bigger picture"* - plant expert at the gene bank.

The gene bank holds a key role in safeguarding what is collected and remaining, making sure that seeds are alive and available for those (selected groups) that want to use the resources for research, breeding etc.

For some participants, this category does not exclusively include traditional Swedish seeds but also other OPS varieties that fit the Swedish climate, bought from European seed producers. For example, one of the smaller seed companies, that buy in OPS and heirloom varieties from other European countries said: *"I try to mention, both in my book and when I lecture, what the situation looks is like, that 75% of our diversity has disappeared and how important this is to highlight"* - seed producer and company founder.

*Swedish and locally adapted seed*

There are three actors (the meadow seed company and two small scale seed companies) identified, whose main motivation is to produce and sell Swedish seeds only, all with growers' collectives across Sweden.

One motivation is to create a market for Swedish seed, and another motivation is provenance. "*Provenance is very important, the genetics in a daisy from Germany, compared to Sweden is very big*" - the meadow seed company.

One commonly overlooked factor is the genetics of the seed and the importance of growing the seed in the climate in which it will be cultivated. Locally adapted seed is something that the participants that are grain farmers mention, as well as the participant from the BoA: *"Local varieties are more robust in a climate that is changing from what is normal. That is a challenge we have ahead of us".*

For grains and meadow seed there are small but established systems for local seed. For production of vegetables and perennials, there is no such system. This is a part of the commercial community that currently developing and increasing their shared repertoire.

*Climatically adapted seeds*

This motivation is partially overlapping, and interlinked, with the previous. As one of the members and board directors of a seed association describes it: "*It is a bit like finding the way back to the old land races that work locally. But you have to look a lot in Canada and Siberia to find varieties that work*". As many of the local varieties did not survive the industrialisation of agriculture the seed savers are looking abroad to find varieties that are suitable for the varied climate of Sweden

or are in fact old Swedish varieties that have migrated. Swedish food culture has changed in the last decades and there is now an interest to grow food that has not grown traditionally in Sweden. One such example being peppers or tomatoes, the latter being one of the most popular crops among beginner seed savers. Seeds adapted to, and produced in Sweden are needed for resilience and robustness, a form of preparation for an uncertain future.

*Organic principles (certified and not)*

Actors in the study, ranging from the BoA down to the smaller grain farmers champion organic cultivation methods. "*Organic production is more important than the Swedish, as we are as close to Germany as to Stockholm, a Swedish flag on the package isn't paramount*" - a quote from the participant from a Swedish seed company that focuses on organic seed, rather than Swedish.

This is not because they do not wish to sell Swedish seed but because there are none produced in Sweden in the amounts or quality needed for commercial organic farmers.

The participants consider this way of farming better for the planet and for ourselves. For the commercial actors, certification is paramount, this is partly due to it being a sign of quality, so that their customers know what they buy. An example of the contradictions that can co-exist within a CoP is the fact that there is an opposing part of the community that uses organic principles but does not pay for certification (as this is costly for a small actor) and work with trust instead. Based on the structured searches, it is common to use other terminology such as regenerative methods, biodiversity friendly, chemical free, soil building instead of organic. The participants using this strategy are small-scale producers and is commonly used within Community Supported Agriculture-community.

To summarise, those engaging with seed saving reflects a shared concern and care for our shared future, hence engaging in the practice of seed saving and surrounding culture. This is a uniting aspect and mutual engagement irrespective of how the participants choose to engage.

## 5.3 The landscape of living practice - organisation of the CoP's

This section concerns the shared repertoire and practices of organising within the CoP's. This encompasses how collective process of negotiation (the repertoire) reflects the goals (stemming from the motivation) of the communities as well as how they work and organise to achieve them and engage with the future practice. Unlike the hierarchical and centralised distribution model that the conventional seed industry imposes, the Swedish seed savers distribute and share seeds and

knowledge by a number of different methods, described below. This exemplifies how the diverse landscape of engaged communities and individuals make up the building blocks for agroecological seed saving. For this section the building blocks of a CoP, practice and reification, are used for analysis.

### 5.3.1 Organising the practice

All the actors in the study engage with OPS and have a drive to cultivate and develop the culture and knowledge that surrounds those seeds. It is the shared common cause that brings them together, a mutual engagement which forms a relationship between them. Within this relationship there is also a shared repertoire as they share the history, background and prerequisites of the Swedish system. There is significant difference in the manners in which the CoP's have chosen to take action (participate), and both oppose and align with each other.

*Grassroots organising*

This way of organising entails the biggest CoP of the study. The work is done on a voluntary basis with knowledge being taught peer to peer. Which is a characteristic of this type of practice.

The two larger members associations of the study use a model where seeds are only exchanged among other members (if the seeds leave the association they do so as food/feed, not seed). Seeds are grown, exchanged through catalogues or online, with no central distribution point. In addition to the seed exchange between members the grain association organises their own ex-situ utility seed bank; a freezer shipping container (see figure 5). Through this members can send excess grain for long term storage and all material sent is threshed and sorted collectively.

The other seed association uses an approach inspired by the old guild system. The seeds are divided into their plant families or type of plant with one or several elders and apprentices that are responsible for the regeneration of seeds. The knowledge from the elders is passed on to the apprentices and each guild might have different procedures.

The herb association is the exemption where the president of the association collects all the seeds and distributes them. They also distinguish themselves by the fact that they sell seeds to the public. This is done after the members first have had their turn and is legal as herbs are not on the list of species that require registration.

There are additional grass roots actors, such as the folk high school and the collective farm, who collaborate with each other and access seed from the associations. These types of collaborations form a network that interlinks communities and highlights that there are not always clear boundaries within the landscape of practice.

*Organising for production*

This is the other major CoP of the study. This CoP has a shared repertoire/model made up of a paid community of growers, scattered across the country, who produce seeds that are sent to a central distribution point i.e. a OPS seed company, who might produce seeds themselves as well. It is at the distribution point, the seed company, that the threshing, cleaning, germination tests, packaging and sales/distribution happens. This model is used by five different actors in the study. Some growers produce seed to more than one distributor. In two case there are also the inklings of a shared knowledge hub, with the intention for the growers to develop their practice, exchange knowledge that could create a stronger and cohesive CoP.

Another community, created by one of the companies, consists of growers creating new knowledge by trialling the seeds in the different climatic zones of Sweden, which is being shared with the consumers of the company. Two of the actors buy in some seeds from agroecological and small-scale seed producers in Europe to sell.

There are also growers selling directly to consumers. This is done by the small seed companies (the perennial grower and the smallest seed company) and individuals selling seed privately.

The members of the grain association also sell directly to consumers (as feed/food), and to other members (as seed). There is potential for these individual growers to become a part of local nodes that can create mutual engagement and local response that can strengthen the joint enterprise. This is exemplified in the study by two seed producers in the same local area, planning a potential collaboration for tree seed distribution. As a local nurseryman and seed grower describes it: "*We work so that we can create synergies in our local context, the more we collaborate, the stronger we are*"

*Organising for conservation, ex-situ*

The gene bank (and on a smaller scale, the associations utility seed banks, see figure 5), are cultivating seeds to be able to freeze them as this allows for conservation of many varieties on a small surface, over a long period of time.

To have reserves and a back-up of genetic material, is the main purpose of gene banks, as no-one knows what uncertainties the future holds and what varieties or genetic material might be needed. This entails different requirements from normal seed saving norms, obtaining enough diversity in the genetic material in combination with efficiency is the reason.

Knowledge is generated from experience but also following protocols by other gene banks in combination with years of experience from trial and error. These seeds are available mainly for research, but also for breeders, certain companies, museums, heritage organisations and botanic gardens. Individuals can also purchase some of the excess seed each year.

*Figure 5 Visit to the utility seed bank of the grain association*

*Organising for conservation, in situ*

"*A genetic cultural heritage and a pool that is useful for returning to, but they need to be alive, living, these things to be meaningful*" - a consultant, farmer and co-founder of organic certification. A living heritage, where crops are grown in the field, evolving and adapting to the changing climate and local conditions (along with maintaining the know-how and surrounding culture) is essential to have viable seeds. Something that is championed by the grain association (example seen in figure 7). In situ seeds develop a resilience that ex situ seeds can't, due to their suspension in time. Something that partially has been forgotten but is now receiving more attention within the domain.

*Political organising*

Championing "free" seeds/OPS as an economic pathway to alternative markets are reasons why participants engage politically. Much of this is expressed, covertly, through the practice across the different CoP's of the study. It is a part of their shared repertoire, historical events and the discourse of conventional agriculture that creates community coherence, a desire for change and action.

### 5.3.2 Mutual engagement within the domain - organising differing views

The actors in the study engaging with OPS and have a drive to cultivate and develop the culture and knowledge that surrounds those seeds. It is the shared common cause that brings them together, a mutual engagement which forms a

relationship between them. Within this relationship there is also a shared repertoire as they share the history, background and prerequisites of the Swedish system. There is great difference in the manners in which the CoP's have chosen to take action (participate), and both oppose and align with each other.

Two main differing viewpoints were observed in which participants wishing for the domain to grow. Those in the grassroots CoP have an interest in keeping seeds of the commons on an amateur level so that they do not need to register and abide by seed laws and be sold as commodities.

The commercial CoP wishes to introduce seed saving and the use of Swedish seeds on a larger scale. The main actors of the commercial CoP spring from the grassroots communities and to a large extent, the way that they operate is still in spirit of grassroots engagement. They aim to use commons seeds to enter the Swedish seed market and make Swedish seeds accessible to the wider public, to farmers, as well as and to encourage further seed saving.

One of the founders of the organisation that is conducting action led research for commercial organic seed production mentions that the farmers awareness changed when they began cultivating seeds for saving: "*The growers that we collaborate with began to talk about the advantages of being independent and the freedom to grow their own seed. To breed varieties that are fit for their farm".*

The part of the domain that cultivates perennial seed and meadow seeds - seeds that are not a part of the strict seed regulations - belong to a different, almost separate domain, as their focus is rather on the food system of perennial plants where the seeds are just one of the methods or tools that they use for propagation.

Annotations from the fieldwork observe that there is a sense that profit should not be mixed in with the conservation of seeds even though this is a potential path that some actors could pursue to make seed distribution reach wider and not just rely on a voluntary work force. This contradiction is captured by one participant when asked about the work carried out by the grassroots community: *"The whole association is built upon free labour and organising, relying on that members are active and growing in numbers. Today it has grown too much and they are working in an old-fashioned structure. It is not sustainable to work the way they do/.../It is not easy to do volunteer work"*. The quote exemplifies that tension can exist within a CoP built on mutual accountability and that this tension potentially can lead to a change of the practice but is simultaneously hard to shift due to reified patterns. As members change and respond to the surrounding world the constant play between reification and practice evolves the CoP.

*Brokers and collaborators*

There are identified key individuals that act as brokers across the CoP's. These individuals are working across or within the wider community.

An example, the founder of one of the seed companies, is mentioned by several participants as a source of knowledge that gladly gives advice and time. These are not official collaborations but simply colleagues in the same sector sharing advice, which is the general picture that can be drawn based on the participants opinions.

Those in the seed commercial sector describe each other as colleagues in the same business. They network together at fairs and such but also compete on the same market. As one participant describes it: *"That's a tricky card, we are both colleagues and competitors".*

However, the participants that produce Swedish seed for the commercial sector reckon that there is a gap in the market for Swedish seed, and that more seed growers are required. *"We have a lot of contact and talk a whole lot. As a seed saver I find it useful to ask my colleagues who are seed growers and other contracted growers. But I wish, and see a need for clearer structures, meeting places and spaces for exchanging knowledge, and this is building right now across several places in Sweden"* - employee at seed firm and seed grower.

This quote not only exemplifies that collaboration occurs, but also that there is a desire and need for it to become more common and that this is slowly happening. This is mainly in the CoP of commercial seed and the multiple growers' communities that are active and expanding.

Some growers produce seed for more than one company and that is another way that the network of growers is interconnected. It became evident during the fieldwork that there is a clear desire within the commercial CoP to develop the social dimensions. In accordance with the CoP framework, this would most likely lead to a stronger community as the knowledge sharing and developed social dimensions would evolve their practice.

### 5.3.3 The organisation of shared culture (reified aspects)

This section identifies the main reified aspects of the cultures in the CoP's. These artefacts, may they be objects, events, actions and documents that reinforce the practice and belonging have been identified in broad topics. The reification is negotiating the meaning of the CoP as they create a shared memory that enables the practice to evolve as well as the knowledge. The artefacts also help to unite the social experience for the members of the CoP.

*Social gatherings:* Within the different CoP's and across them there are social events such as AGM's, annual trips, local and national fairs etc. The grassroot CoP's have a strong culture around this. These social gatherings are essential for the culture, *the characteristics of practice,* and are major highlights for members of the CoP's. It is these occasions when the purpose and meaning is reinstated. As farmer and board member of the grain association describes it: "*on a personal level,*

*my engagement is due to the fact that I get colleagues and a context. We are flock animals and even though we go off and do our own thing for a while we have a need to gather in the tribe and be with our flock for a bit, the social part is very important*". Much of being a core member of organising a community is demanding work and many hours as well as often working for free.

Participants of the study describe the social occasions as incredibly valuable, especially for the individual. An observation across the domain is that social events are rare, but when they do occur, they are greatly appreciated and fuel enthusiasm and willingness to be engaged in the community. Still, due to lack of funding and time, far from everyone in a CoP can make it to these social events.

*Membership rules:* This term entails all clear structures and surrounding management (a reinforced shared repertoire) which makes a stable reified base for participation and defines belonging. It is most obvious in the member-based associations and is both cherished and criticised by participants. This is a natural part of a CoP as this is how members evolve the grounds for membership as situations shift. The grower community also have requirements that need to be met such as the methods of cultivation, certification etc in order to be considered 'members' of the community in accordance with the *duality of meaning.*

*Publications, printed material:* This is an important feature of the member associations and other actors. Although they are time consuming to assemble, the community appreciates them, and they are reified objects that bring members together across the country. They are a reminder and form of diary of the achievements of the community and a representation of the CoP. The websites of other CoP's play a similar role as this is a forum/a reification, where they in words and images can represent their "*doing, thinking, talking, feeling and belonging*" (p.56 Wenger, 1998)

*Online culture:* Virtual meeting places is a major way in which the participants find and share knowledge/experience with other growers within the wider domain, not just in Sweden but globally. Allowing them to connect to the wider domain and extend their mutual engagement and joint enterprise. Which allows for tapping into the wider CoP of seed saving and the agroecological seed movement. The growers' communities and the grassroots actors engage with each other mainly online, as face to face meetings are rare and complicated to organise. Much of the reified knowledge is found and accessed online in text, audio and video format. Forums for sharing knowledge exist in multiple forms (closed and open).

*Sending seeds:* This is a core practice in the shared repertoire within the domain of seed saving. Each seed saving CoP has routines for sending in seeds, either to a central point or directly to other members or non-members and is a

form of culture. As this happens mainly at the end of the growing season, it marks a part of a seasonal time wheel that further reinforces a belonging by being a part of a rhythm, that is a part of reinforcing the joint enterprise.

### 5.3.4 Seeds as symbols

The most prominent object of reification are the seeds. From the sowing to the final bagged or packaged seeds waiting for the next growing season. All these steps are a part of the reification of the CoP's (they each have their own procedures in place). Below is a summary of all the different meanings that seeds hold for the participants.

*Artefact:* In the gene bank and in the smaller utility seed banks seeds are artefacts. Seeds of this type are not objects for cultivation. Principally, they are genetic resources for future use, a reserve for coming generations.

*Commodity:* These are predominantly commercial seeds that are sold to the public. These seeds are sold for further cultivation to be consumed (though they can also be saved for those that wish to). An important part of the reification is the packaging and other added values when the seeds become a product, as observed with the two largest seed companies in the study.

*Gift/exchange object:* These are seeds traded or gifted within the members associations, or among individuals and at seed swaps. The seeds are not always free (there will be postage or a small symbolic fee), but neither are they sold as commodities (as this would break EU seed regulations).

*Statement:* Seeds were observed in two art exhibitions, as a way of highlighting other topics (in both cases with political aspects) with seeds being the medium through which to engage with the audience. Example shown in figure 8. One of the seed growers also gives an example of when seeds they had grown became illegal on the market due to restrictions in the seed laws. As a stunt and political statement, they gave away all the seeds instead of selling them.

*Educational tool:* These are seeds that are used for learning and was observed at the folk high school (see figure 8) where a part of the practical learning is done with the seeds. They are used to teach seed saving, cultivation as well as cooking at the school.

## 5.4 The collective body of knowledge

The doing in a CoP consists of the seamless interaction between participation and reification. It is constantly evolving and creates meaning for a community across time and space, with knowledge as a recurring central theme. Wenger states that all education is an opening for exploring ways of being which lies beyond our current state, and while the CoP-framework has more to do with knowledge, it is

applicable to all the participants in the study and suits the agroecological approach. They have all gained knowledge about the seed system and are now working towards their own systems to change the status quo.

This section describes the ways in which the CoP's work with knowledge creation and knowledge distribution through both practice and reification. Within the CoP-framework, preservation and creation of knowledge are parts of the social fabric of learning, and key for the continuous work of cultivating seeds each season.

The common denominator of the entire landscape of practice is the lack of existing knowledge in the Swedish context, both on a larger and smaller scale of production.

For the members-based communities, knowledge is a central part of the culture and the mutual engagement. The educational community overlaps with the grassroots community, as they work on a similar scale of cultivation, they can exchange knowledge as well as seeds. The ex-situ conservationists are also engaged with the grassroots community and they do each other favours (such as accessing or cultivating seeds).

The commercial community is a younger, expanding and less established as a CoP. Much knowledge that they require is missing, as there is little previous reification and practice to build upon, as they want to scale up production. The existing knowledge is of course applicable and useful, but not enough.

The meadow seed company has spearheaded the knowledge creation and act as inspiration for the development of the vegetable seed sector. The interest in seed propagation and cultivation in Sweden is growing. Organised trials to gain and generate knowledge, conducted by grower communities is happening currently. These trials are also a sign of national relevance, as some of the funding has come from the BoA.

### *5.4.1 How knowledge is generated and reified*

Knowledge can be preserved as reified objects, but also as embodied, living practices. Participatory research, an agroecological concept which creates empowerment and the capacity for change was found in multiple places throughout the CoP's, in varied sizes and shapes. The following forms of knowledge creation and exchange were identified from the empirical data.

*Learning by doing (trial and error):* The main way in which the seed saver domain at large is learning is through the practical seed saving, conducted by seed savers across all the CoP's. This knowledge is not reified as such but is tacit. An example of organised trial and error is the funded trial to grow seed on a larger commercial scale. They had no prior experience or past practices to build commercial seed production on, their learning was done by trial and error.

Some of the grower communities intend to organise so that the learning of each season can be recorded and shared for the benefit of the community and others. *"We've learnt to grow these ourselves, relevant to Sweden, new and reintroduced varieties, partly through foreign agronomists, partly through documentation, experiences from abroad, academic reports as well as lots of own field trials and cultivation ranging from small trial squares, demonstration fields to large scale cultivation*" - co-founder of company selling Swedish legumes and alternative grains. The quote is describing their journey of finding and gaining the knowledge that was not available, so they had to create it themselves. This exemplifies the diverse ways in which knowledge can be gained to find the right information and is another example of agroecological learning.

*Tacit knowledge:* "*It [the knowledge] is in their hands, not the words. All the small tricks they do. They can't tell you about it as to them it is just an obvious way of how they work*" - Advisor retelling of a visit when writing a book on heritage seeds. Much of the skills and craftsmanship of seed saving is in the hands of those that have done it for a long time, to convey this knowledge is not possible as many do not have the words, the knowledge is in their hands.

There is a lot of tacit knowledge especially among the seed saver associations and individuals, who have been saving seed for as long as 50 years. There is a challenge to capture this knowledge in ways so that it can live on in the CoP. Perhaps this is where it becomes evident that the methods and means for passing knowledge need to be developed. Moreover, a sign that there is a need for more seed savers that can carry the knowledge for future generations, making it less vulnerable of being lost.

*Traditional methods/appropriate technology: "The old solution and ways of working often hold a key to how we can do our work better, knowledge that is a bit lost today"* - farmer and board member of the grain association. Small scale farmers and others within the CoP are using farming principles that are not, in the mainstream commercial opinion, efficient, modern or profitable. For such reasons they are not acknowledged or considered as important and a vital part of Swedish agriculture. This is where the agroecological perspective needs to be considered and supported. Small scale and local solutions and innovations are a key part of a diverse and resilient farming system. By sharing and applying these methods, the growers can inspire others and convince others that they work.

*Educational hubs/forums for exchange:* There is a distinct lack of higher education related to seeds identified by participants and the structured searches. Instead, much of the knowledge is taught through agroecological methods. All of which strengthens the mutual engagement. Physical, social events are a form of

forum, which is mentioned by many participants as a key factor for generating knowledge.

There is a general wish from the participants for more established ways to learn. Several participants wish to see and help create more physical, but lack of time and resources hinder these plans currently. The empirical data identified only one such hub, the folk high school. They teach students, both the practical skills and about history, culture and self-sufficiency. One grower, who attended a permaculture course at the school, describes the value of such places: *"To be at such a synergetic place where people meet and gain energy and share knowledge is incredibly important".* The quote reinforces the link between belonging and the forming of CoP's, and how social aspects are vital for organising.

Most forums are found online, such as closed groups on social media platforms and member forums. Both professionals and amateurs use these to ask questions, look for information and share advice. One example of creating new means for exchange is one of the seed companies that did live Q&A's on a social media platform as an interactive way of sharing knowledge.

*Local groups and seed swaps*: These occur across the country, predominantly in local settings and are not necessarily organised communities. The seed swap attended to as a part of the fieldwork did not involve that many seeds or much swapping. Instead, the main purpose was the social context and to share knowledge and information.

These smaller social events foster the community building, knowledge levels for individuals and maintain social bonds. They are also a common place of the first interaction for new members.

*Raising awareness and lobby work:* The work that is carried out by the ECVC member is predominantly on the EU-level but has the aim to spread the knowledge about the values of LVC to growers in Sweden. This is done through lectures, campaigning and representing small scale farmers at the BoA and the EU. It is not practical knowledge but rather knowledge that generates awareness of the external factors that affect the communities. By engaging with this knowledge, the actors can become more informed and take action to improve the access to OPS for example. In other words, this type of knowledge generation is key for agroecology as it can help growers to mobilise politically.

*Publications:* These are an important way to spread knowledge within CoP's, to make the community feel alive and offer participants a forum. They can act as a main way to spread awareness further than those that are already active within a CoP. There are books on the topic of seed saving aimed at the public, these are objects that can act as a first awareness raiser among those that have no or little knowledge of the importance of seed saving. To have these accessible to the public,

and not just members of a CoP is important as it is a way to gain new interest of the domain.

*Social media:* For the small-scale companies' social media presence is important (although not always something that they want to do and can act as a hindrance if they are not active). The importance of a virtual presence online is mentioned by all the commercial actors.

By summarising the data and analysis presented so far in this chapter, it is possible to gain an overall understanding of the wider phenomenon of seed saving, both conceptually and applied to the Swedish context. With this overall picture it is possible to grasp where the practice of seed saving and its engaged members are coming from, and where it has led to.

The chapter that follows will delve into the participants' view of the future, the challenges and the potentials that they envision. As stated earlier, a CoP is always in the process of redefining itself by the changing practice and reification, nothing is static. It is therefore of interest to look at the future.

## 5.5 The future

The fourth step to answer the research question of this thesis was to understand where the domain of seed saving in Sweden is heading. The core of that is to identify and understand the challenges that the participants are facing according to their own experience as well as the potentials and opportunities. Some of these will be external and outside of the actor's power, others will come from within the CoP's themselves. CoP's respond to the world that they are situated within and their meaning and experience will be shaped by it, as shown in chapter 5.2.

### 5.5.1 Challenges

This section lists the external and internal factors identified preventing their communities from evolving. Certain factors, historical and external, are out of the participants and community's control and contribute to shaping the mutual engagement and joint enterprise that they share. The challenges are not listed in any order of importance.

*Growers and seeds:* Participants from all seed producing CoP's state that there are not enough growers to cultivate seeds. For the grassroots communities the issue is ageing members and not enough new members, and there is barrier to begin saving seed. In regard to this the key identified aspects are lack of knowledge and confidence.

Simultaneously, there are not enough seeds to be cultivated. This is only an issue for the commercial CoP. The issue is that there aren't enough growers to increase

the amount of seeds for cultivation and therefore there aren't enough seeds for more growers to cultivate Swedish seed on a larger scale.

*Lack of time:* The majority of participants who hold organising roles, both within the grassroots and commercial, express this as a constant issue that limits them. A hindrance to do their work as they wish. The participant that represents ECVC expresses it this way: *"What I have experienced of the seed movement in Sweden through my work is that it is hard to get going. It is hard to get hold of people and to create collaborations as many of them already work full time, there is a lack of time. There are many small groups, and everyone is limited by their missions"*. When speaking to representatives of those groups, lack of time is something many of them describe as a major reason for not collaborating more. It prevents several participants from documenting their work, which is something many wish to do. For others it is simply that the knowledge is all in their head, heart and hands and there has been no opportunity or plan to pass it on, other than face to face.

*Swedish farmers and consumers are largely depoliticised:* Swedish farmers are a part of commercial food system, where it is hard to break free and do things differently. As for consumers there is a general lack of awareness. As one participant, an international agricultural advisor, writer and co-founder of the organic certification, describes it: *"Internationally the seeds are much more an issue of power, well it's a question about power in Sweden as well but no one cares. The farmers in Sweden have since long surrendered to not having any power over their cultivation or land/.../ larger parts of Swedish agriculture is adapted to fit the neoliberal way of thinking".*

To create a wider awareness and engagement there needs to be a broader shift in the mindset of both food producers and consumers.

*Lack of formal education:* Exempting the courses described in chapter 5.4.1 there is little available formal education to take part of. No higher education institution offers information about seed saving. Consequently, there is a lack of awareness and acknowledgement among professionals in the sector of agriculture and horticulture as well as the rest of society. This is mentioned by multiple participants, especially those in the commercial domain, as an obstruction for the domain to develop.

*The financial inability/risk of investing in machinery and space:* The threshold to invest in commercial seed production is high for new entrants in seed production. Lack of tools and machinery are key features along with the cost of potential certifications. As there is a barrier to start off with, to find more growers there needs to be a shift and more support to cross that threshold. Replacing productive/income-

bringing land to try seed production (with no certainty of financial return) is a risk that prevents growers from attempting to save seed for production.

*Sustainability of the shared enterprise:* In the grassroots domain, one of the main challenges is time and workload. This is linked to the lack of time as all work is carried out on a voluntary basis. Many who are active in running these associations describe their work as rewarding and important but that there is inefficiency in some of the organisational models, how they, potentially, are unsustainable in the long run. Several participants voice that it is not sustainable to rely on voluntary work, but that it is also a core value of the organisational model. The fact that it is unpaid work leads to many retired people being able to be active and younger members to having the time.

*Corporate control over seeds:* The actors in the study have all found ways in which they bypass the strict seed regulations of the system. But it is a constantly present and restricting problem for many of the actors, in particular the small-scale seed companies and the heritage grain farmers. Challenging the status quo is not a part of their official agenda. Resistance is done in subtle ways.

One of the more vocal participants is one of the artists who describes it this way (field notes from trip to the grain associations utility seed bank): "*Seeds are like folk songs, they have always been traded (The artist makes the connection between the word traditional and the etymological root to trade) and been passed on across borders and between people, they can therefore not be owned! Especially not by an industry*".

*The rigidity of the system: "It is almost so that you feel that they are working against you, though there are those that work at the BoA that understands us and the situation, but they have directions from above"* - founder of small-scale seed company. This tension, or discontent, is often aimed at the BoA (and in extension at the EU) from all the seed producing CoP's, even though on an individual level there can be good communication and understanding between the two. For the BoA the challenge lies in supporting both small and large farmers within the same structure: *"It is a huge challenge to think about both the very small farmer who might cultivate less than a hectare sometimes/.../ up to the giant farms that might be 100's of hectares"* - advisors from BoA. The actors from the tree crop and the perennial sector express similar frustration about the rigidity of the system but for different reasons. As many perennial crops are not recognized as food crops.

*Laws and regulations:* Several participants identify laws and regulations as a major hindrance for Swedish seed production. However, it affects the entire seed saving domain in the EU as an external factor. Ranging between the types of seeds

that the commercial actors can sell to being the reason for why the grain association was created.

Across multiple of the communities there is an expressed dissatisfaction with the rules and regulations regarding seeds and the EU and the Swedish government's lack of support for those that work with seeds from the commons. Much of the dissatisfaction is due to the amount of administration and restrictions that the EU regulation imposes on small actors. The current system is designed for large producers and does not account for the situation for farming on a smaller scale or non-profit.

*The know-how of seed cultivation:* There is the intention and aim to scale up the cultivation of seeds for Swedish agriculture, especially for organic farming. But there is a lack of knowledge and other essential elements are also missing. Such as infrastructure and appropriate technology for commercial seed cultivation as noted by those participants of the study that are trialling commercial production. There needs to be an increase in the number of seeds that are fit for commercial larger growers. Some actors have developed their own systems and technology, such as the meadow seed producer.

*Lack of research:* From both a scientific and commercial perspective there is lack of research in the field of seed saving such as national production, breeding and provenance. The participants express a clear need for this to be developed to put seed production on the national agenda in order to create a commercial Swedish seed sector and for the social aspects to gain further momentum.

*Impending generational knowledge gap:* Many individuals are of an old age with much knowledge that is not documented or passed down. Several of the participants raise this issue. "*It is a living craft, this is why it is important that younger growers learn how to do it, there is no point if we have several old knowledgeable members that die and not have their knowledge passed on before"* - board member of association. To capture some of this knowledge there are actors that seek out the knowledge independently and document it. In the associations, there are also projects through POM that capture knowledge and living history and make it public. There are some worries that existing reified culture and knowledge is held between core members who've been involved for a long time and is not passed on as expressed by a board member of the seed association: "*It's the same old sheepdogs that do the work, and they are old and are slowly dying. We need new engaged members so there isn't a knowledge gap*"

### 5.5.2 Cultivating future alternatives

Drawing from the analysed data, the Swedish seed saving communities as a whole are progressing, especially in the commercial domain. Participants were

asked about the future, what changes they would like to see or wishes that they carry. The following section is a summary of the key points identified.

*Change from the top down*

*Recognition and support for the important work carried out:* The feeling of not receiving recognition for their work and like they are working against the system is stated by many. In particular the participants that provide food and seeds to the public and do so in alternative ways to the conventional system. *"It would have been fantastic, and a dream, if the BoA would support the transition that would make our type of farming easier and see the value of what we do"* - seed producer using regenerative methods.

*Financial support to be able to invest and try seed production on commercial scale:* The participant from the BoA suggests a fund that could be available to farmers that wanted to transition land to seed production and might need machinery and knowledge. This would be one way in which seed saving could become a more widespread practice.

*Support for starting seed production on a micro scale:* The importance of increasing opportunities for more small scale producers, important in themselves, but also for the larger production is voiced by this seed producer/seed company employee: *"A very important part is this micro production - it enables when the goal is one kilo of seeds for a beet, then you can sell 1000 bags, that is enough to keep that variety alive and give it a broad genetic base".* This is a first commercial threshold of cultivating larger amounts of Swedish seed, not many kilos are needed to be able to make a difference.

*Opportunities and facilities for breeding:* If Sweden is to have seeds grown for commercial purposes, the quality and properties of the seed need to be bred to fit farming of a larger scale. All plant breeding stations in Sweden have been closed, the participants see a need for this to be reinstated, and for the state to fund it.

*Change in the seed laws to enable cultivation of Swedish seed diversity:* There is an understanding that the seed laws maintain a standard, needed for the large-scale producers of grain, fodder and the other major industry crops. For vegetable growers and other crops, easing the regulations and controls, changing prices and administration workload would increase the opportunities for the CoP's to grow and in extension to offer a wider diversity of available food to consumers and therefore more stable food production in Sweden.

*Create shared infrastructure to produce commercial seed on a smaller scale:* Shared/communal testing and screening facilities to ensure the quality needed for

commercial seed are missing. They are particularly needed for smaller producers to test and screen for disease, pests and such needs to become accessible and affordable if the numbers of producers are to increase.

The majority of these suggestions affect the commercial domain the most. This is due to the grassroots domain operating largely without the involvement, or need, of top-down support. The changes from the bottom up all echo the agroecological principles listed in chapter two. With that in mind it is quite clear that there is potential for a wider and established seed sovereignty to gain momentum.

*Change from the bottom up*

*A stronger, united voice/better communication and mobilisation:* For the participant in the study working in Brussels with ECVC there is a wish to engage the various seed savers in Sweden. Older participants in the study suggest that the lack of political engagement in Sweden in relation to farming and food growing is one reason.

Another factor adding to the lack of mobilisation which the study found is the lack of time. The willingness to engage with political issues is there, but not the time for it or the social infrastructure.

*Self-organised commercial seed selling:* Participants envision online systems similar to food assemblies (REKO-ring). This is mentioned by several participants as a realistic way forward, as local engagement and solutions seem to be more plausible for changing the food system as opposed to large scale structures.

*Self-built/adapted appropriate and accessible technology:* This has been developed by the company in the meadow seed sector and is being used to develop similar, but adapted, technology for the vegetable seed sector. This is needed to make seed production viable timewise, but also financially. It is a wish, mainly from the commercial community, that both smaller and larger scale technology is developed.

*Local nodes:* Local nodes are a feature that many participants highlight. Instead of national mobilisation, the way forward is local communities sharing facilities and resources. Examples of such are seed libraries, utility seed banks and shared facilities for threshing, cleaning etc.

*More food growing:* There is a wish to see more people in Sweden growing food and engaging with its origin. A first step to become aware of the origin of seeds is to begin cultivating food and flowers.

The wishes and opportunities from the bottom-up perspective identified by the participants focuses on local solutions and agroecological principles such as

appropriate technology, self-organised systems, and a stronger social movement, working together.

Chapter five has offered in depth understanding of the organisation of seed saving as perceived by the variety of CoP's encountered in this thesis. The motivation for individuals, followed by the communities engaging in the practice was determined. This allowed for understanding how they are organised. The mutual engagement, here are the differing understandings and tension points. those that knit together the domain. The shared culture identified, including the seeds.

*Figure 7 Forest Garden producing both food and seeds from perennial crops*

*Figure 6 Tour at heritage grain farm, example of in situ conservation of heterogenous seed.*

*Figure 8 Participating in interactive art performance in field of buckwheat, example of seeds being used for art as well as enabling participants to connect to food and farming*

*Figure 9 Practical seed class at folk high school, prior to the practical session a theoretical session had taken place*

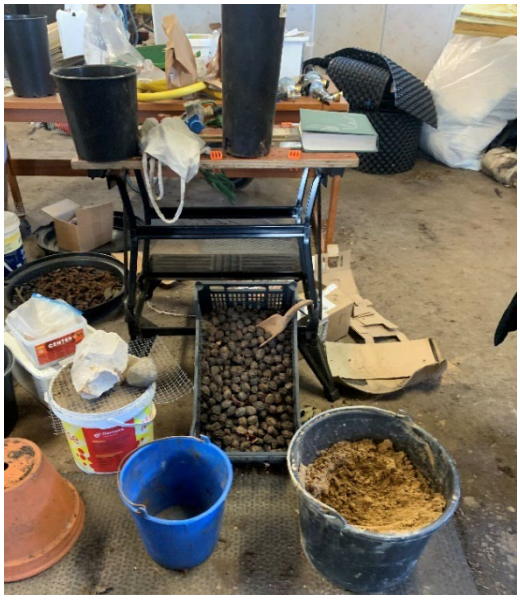

*Figure 10 Walnuts in preparation for germination at nut tree nursery*

*Figure 11 Interactive part of a field visit, trialling threshing of heritage grain using old machinery*

# 6. Discussion and summary

This study, rooted in agroecology, ask the question, how is the practice of seed saving cultivated and organised? The answer can be presented in two ways. It can be interpreted as an analysis of the situation in Sweden, but it can also be construed to grasp a bigger perspective of whom is carrying knowledge and tending to national and cultural seed heritages where there is no organised seed sovereignty movement, or organisation, leading the way.
The previous chapter presented the results interpreted through the CoP framework (Wenger 1998). In this chapter these analysed results are interpreted and condensed further. The first part of the chapter is divided into sections in the order of the four steps stated in relation to the research question. Followed by a discussion of the research process and methodology, the limitations, implications and future studies. However, first a section presents a short introductory answer to the research question.

The result provides previously undocumented evidence showing that there are a multitude of initiatives/CoP's working in their own distinct ways, (directly and indirectly) with seed sovereignty. There are intersecting points of collaboration, but ultimately the different communities have differing goals.

*The actors and communities engaging with seed saving*

The following CoP's were identified in the Swedish context:

- Grassroots CoP: Established organisations, local initiatives and passionate individuals make up the community. They are focusing on a wide range of seeds suitable for agroecological cultivation. Due to the level of their seed saving and their organisational structures they have found ways work within the existing system. All of the engagement is done on a voluntary basis.
- Commercial CoP: A growing and expanding community, that is establishing itself. It is structured by small companies, some, with growers' communities offering a wide range of seeds for agroecological food production.
- Educational CoP: In the form of education there are spaces, physical and virtual, for sharing knowledge on seed saving, which all the CoP's do to a varying extent. Though physical spaces to learn are rare, instead many go online to find information but lack a physical space to learn, only one such place was identified in the study.

- Conservation CoP: Active conservation work is found predominantly as ex situ storage and research. [13]Found both in the research domain, funded by the State, as well as in the grassroots domain.
- Political CoP: The political is present in all CoP's. More covertly on the grassroots level organising, more so in the commercial CoP, but not too outspokenly. Only one actor was found, the only Swedish member of LVC, that has the political agenda as their main cause.

There are other actors included in the study, active within the domain such as the Swedish BoA who are not a CoP but rather like an external factor that the CoP's of the domain have to navigate and interact with. In addition, there are the brokers, the knowledgeable individuals who acts as bridges across the communities.

At first sight seed saving is an innocent hobby, but from a seed sovereignty perspective it is a subversive tool for beginning to take back control over the food system, as several of the previous studies on seed movements such as Phillips (2013), Sonjasdotter (2024), Angé (2022) support.

*Why and how the actors and organise*

The work of the participants is deeply rooted in agroecological practice, even though they do not use this term. Moreover, it is clearly linked to issues of supporting bio- and agrobiodiversity, food sovereignty and farmers rights, declared in UNDROP. What they are doing is enacting a different food system, where they take the access to seed in their own hands, and bit by bit rid themselves of the reliance of the industrial seed industry.

These actions, the study found, are not loud or provocative but when analysed are deeply political and impactful. They are, though their actions, making visible the faults of the current food system. By enacting these changes repeatedly, growing little by little, the order of things is slowly restructured.

On a similar note, all participants that engage and work on a voluntary basis highlighted the social aspects of the mutual engagement. In chapter three this was described as something that is often undervalued and unseen, which is affirmed by Phillips (p.170, 2013) in the Canadian grassroots seed savers community.

The analysis presents evident results that the social interactions and community (the shared repertoire and mutual engagement) of a CoP is highly valued and creates meaning, joy and hope among participants. However, this is never the main focus of their practice. The reason why the participants have decided to organise and work

[13] Both ex situ (gene banks with seeds suspended in a frozen state) and in situ (seeds grown each season and adapting the changing climate) seed saving is important. Both are extremely valuable from a conservation point of view. The gene banks act as a backup reserve of collections of genetic material. Of equal importance is the in-situ conservation, which is gaining importance to carry out conservation work (Pedersen, 2020, Jordbruksverket 2020).

with seeds is largely out of care for the seeds and/or a will to change the food system in various small and big ways. Many of the communities have, due to a lack of the appropriate seeds and knowledge, enacted alternatives through self-organisation.

The strategies adopted to diversify the food system through seeds are innovative and multiple. Ranging from collective farming, reintroducing nut production, creating engaging art to creating organic production of commercial vegetable seeds by 2037. There are ambitious, big aims but alongside them there is the day to day or rather season to season work of cultivating the seed treasure of Sweden. This diversity of practices and seeds is typical of agroecology, where challenges across the food system are addressed through local and context specific innovations.

*Knowledge cultivation, sharing and passing on*

The study affirms the importance of knowledge in relation to cultivating a practice. Knowledge plays a central part within all of the identified communities of the domain in both the reification and practice. Hence the focus on knowledge sharing throughout the thesis process.

Through collaboration with others, it is easier for the individual to understand their own reality and the role they play, and in a sense, this is what the CoP concept entails. This is most tangible when observing the commercial seed sector which, of the CoPs in the study, currently is seeing the most change. As the information and knowledge, they seek does not exist yet, they are instead creating it themselves. That process is reinforcing the three *characteristics of practice, joint enterprise, shared repertoire* and *mutual engagement* that builds a strong CoP which all CoP's go through. To work together includes cultural, ecological, social, economic and political aspects, visible or invisible to the participants. All this is a part of the *duality of meaning*.

*Challenges facing the communities and actors*

There are many challenges that shape the practice of the CoP's in the study. One major identified obstacle is getting official recognition for the important work that is carried out, both the cultivation of the Swedish seed heritage but also the structuring of the foundation of the future Swedish seed production. The ITPGRFA article 9 recognises the role peasant and small-scale farmers/food growers play in relation to seed diversity (UN, 2018). This is something that is not at all highlighted in Sweden, where seeds origin is of little importance in agricultural discussions. The challenges identified by Börjesson (2021) are echoed by this study, there isn't enough seed, and the surrounding infrastructure needed for larger commercial seed production does not exist. That more investment is needed in breeding facilities and such, to be able to scale up commercial production of Swedish seed.

*Potentials and opportunities in the future*

Instead of collaboration on a national scale within the seed saving domain, it is more probable that the future offers a number of local hubs or nodes. There is an expressed interest from many participants to be more united and to have social, physical and virtual meeting points and there is potential for this to evolve in the future. Some of the participants of the study do have a seat at the table in BoA reference groups in relation to seed laws, but are, in their own words, not heard and the odd one out.

This could change, if the importance and potential of local and national seed production receives more attention and support by the BoA, other top-down actors and the public.

Among the actors and communities' knowledge is not gained through academia or the mainstream education system but co-created and shared among peers. However, there is an expressed wish for accessible, widespread higher education and training in seed saving and breeding that would acknowledge the potential and importance of seed saving to a wider audience. In particular within the agriculture and horticulture sector.

## 6.1 The research method and process

Wenger uses the term 'the living landscape of practice', the field work for the study has been like a walk throughout this landscape. A walk which offered the opportunity to try to comprehend the nature of practitioners, their identity, knowledge and learning within the phenomenon of seed saving in Sweden.

The lack of clear methodological guidelines for MSES meant that it was important to clearly define the research object. This was proven difficult as there was no predefined domain or community of seed savers to explore. For periods of time, there was not a clear boundary for the process, which at times felt fitting, as agroecology itself is an all-encompassing field, and at times overwhelming. It began with a very wide perspective that narrowed down, then widened and went through multiple shapes. I was grateful that I was able to carry out my study under the course of a longer period of time, part-time over the course of a year. It allowed me to dig a bit deeper and explore further.

There were several routes to follow and where this study has led is a result of the participants that were available to participate at the time, my geographical location and prior knowledge of the topic, the chosen interview questions and numerous other factors. The description by Candea (p.485, 2009) that "*understanding the shallow may itself be a form of depth*" fits this study as it aimed to obtain an overarching understanding of an uncharted phenomenon. With this in mind the comprehensive picture that has been made available, offers a broad form of depth. The bricolage inspired method to collect reified material from the domain aided this process and was important to get an overall understanding.

## 6.2 Limitations, implications and future studies

The study included actors located predominantly in the south of Sweden which could lead to biased conclusions, based on geographical location, about the phenomenon at large. As the general results showed, much of what happens occurs on a local level, therefore the study is a model of the constituting parts of the seed saving domain. A more in-depth study of the field might have revealed another picture. The chosen method of a MSES would have lent itself better to more extensive field work and study. That said, the field work that was carried out gave great insights into the practical work of the communities in the domain. It could have given a lot more depth if there would have been the possibility of following different communities of the domain during a growing season, from seed to seed. The aim was to carry out the study as a participant-observer, due to time limitation and location of participants, this type of field work was practiced less than expected. This might have created data that was less based on the more complex reality in the field and is instead based on the lived experience of participants through interviews and conversations.

The results of the study can be used to further the understanding of agroecological action in Sweden in relation to seed and the wider food system. The study can be used for future collaborations within the domain, increased domestic seed production. From an academic and agroecological perspective the study can be added to the international body of work relating to seed sovereignty and ethnographic work relating to seed savers.

The study is valuable in the sense that it sheds light on a largely overseen sphere of agriculture and food production in Sweden and can highlight both the work carried out by the CoP's, the value of their practice, the potential of the seeds and the challenges that they are facing. This study might act as backbone to do further studies within the seed saving domain. Other implications could be that what this study highlights as challenges and hopes from the domain can be used to take action and support the development of structures that enable seed saving.

The hope is also that the study emphasises the future and potential of the domain. The participants have offered a range of suggestions to enable the development of their domain.

*Future studies*

Stemming from the result of the research a set of questions and suggestions for further scientific investigation became apparent. It would be highly relevant to research what role Swedish production of OPS might play for the national food strategy. Currently seed production is not included in this plan. Research in this field would shed light on the work and systems developed by the seed saving

communities and how they can be furthered from a food sovereignty perspective. In addition, it would acknowledge their competence and take it into consideration as the Swedish state is preparing for future climatic and geopolitical challenges.

Another suggestion is to carry out a systemic review of practical and legislative changes that are needed in order to further possibilities to produce seed on a larger scale. This includes looking at infrastructure, regulations, available training for farmers, reintroducing breeding stations etc.

Lastly, a suggestion to carry out an in-depth study to acknowledge the role and work of the grassroots community of seed savers in Sweden to understand the value and importance of the work they have carried out for decades. The potential and value held in these communities is partially mapped but much remains to be understood of the actual value of this knowledge and living seed heritage.

# 7. Conclusions

This chapter presents the concluding remarks of the study as well as some reflections. The study has succeeded in a creating an understanding for how the practice of seed saving is cultivated and organised. The results from this study can be used both to understand the broader field of seed saving (on a contextual level) as well as for the specific context of Sweden. The study captures the reasons for why it is of such importance to carry the knowledge and practice.

The analysis offers insights to the motivations for engagement in a community of practice which are diverse and complex but always rooted in a deep care. A care where the seeds represent diversity in all sorts of forms and the possibility for a different food system that is based on agroecological principles. As such, all the work done in the domain of seed saving is political/ideological as it is fuelled by an engagement and care for something that is not valued enough by those in power.

In addition to highlighting seed cultivation, the study emphasises alternative food growing methods, often by mainstream agriculture.
Hobby growers, collectively owned and managed farms, associations bringing together farmers and consumers, regenerative methods and small-scale market gardens are all examples of how participants of this study are cultivating both seeds and food/feed through agroecological principles on local levels.

All levels of seed saving matters and is important as it is a direct, local and embodied way in which to engage with transforming the food system, both on an individual and personal level as well as an in organised forms. It is a political act which is connected to every agroecological movement across the globe in extension, through the practice.
Put in this context, the work by the Swedish seed savers is a small part of a wider struggle. The individuals, collectives, companies and associations might not feel themselves as a part of a global movement, but when framed as CoPs that vary in kind and in scope, this thesis shows the layers of shared experiences and challenges, which is one of the things that this study wishes to highlight as a final point. To end, here is a reminder by one of the consultants conducting trials to produce seed on a commercial scale, highlighting the important work carried out now, for the future farming systems: "*Seed saving is completely crucial for the future, everything is unimportant if you don't have seeds"*

Locally produced agroecological seed play an intrinsic part in the future, both for the small scale food grower in private gardens or on community farms as well as the field scale production that feeds the population. Many solutions to the future challenges facing agriculture are held among the CoP's explored in this thesis, if more stakeholders are willing to listen.

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# Popular science summary

Seeds play a vital part of agricultural practices around the world as well as offering food on our plates, as much of what the global population base their diets on relies on seeds. Throughout agricultural history a wide and diverse amount of seed has been cultivated, reflecting local cultures and their needs. Today agriculture has become industrialised and globalised in many parts of the world which has led to a loss in seed diversity. A loss as in their actual existence, many varieties no longer exist, but also a loss as in growers and farmers no longer having access or knowledge of how to cultivate these seeds. This has led to making seed saving, once a vital skill, a forgotten craft in those parts of the world where industrialisation has a strong hold.

Seeds have shifted from being a common good (belonging to anyone and responsibility of everyone) to become a commodity that can be owned and in need of strong legislation and laws. In countries where there is a strong agroecological movement supporting small scale farmers there are often organised networks working with seed sovereignty. But in countries that are largely industrialised, and where there are no such networks, there is little understanding of who it is that is caring and cultivating the seeds that belong to the commons. This study explores and finds an answer to who, how and why engage with this world of seed saving. More specifically, in places where there is no agroecological or food sovereignty networks to support such actions.

This study shows that seed saving is a practice that is well established and that there are a range of communities working in distinct ways to cultivate seeds from the commons.

The study concludes that the work carried out by these communities is motivated by an engagement to change the food system, but not in a unified manner. Instead, it found that action is often happening locally and undefined spheres of interest.

It can be concluded that there is a great deal of potential to develop the seed saving systems in Sweden but that core challenges exist that needs addressing, both from authorities and within the communities themselves.

# Appendix 1 Interview guide

Who are you?
Describe the work you do in relation to seeds?
Are you a part of an organisation/company? If so, how are you organised?
Why and how did you gain an interest in seeds?
What motivates you to do the work? Why is it of importance?
Where did you gain your knowledge in relation to seed saving?
How do you cultivate knowledge?
If you have been a part of the movement for a long time, have you seen it change?
What potential do you see in the future and what wishes do you have?
What is hindering your work?
What is preventing the movement from moving forward?
What other actors are there that you collaborate with?
What would you like to see in the future to enable the work you do?

# Appendix II Interviewed participants

| Perspective | Information about actor | Role of participant |
|---|---|---|
| Certified Organic, Commercial seed company | Family-run and established in 1989, sells both Swedish and seeds from abroad. Has a grower's community as well as own production. One of the first to import seeds, to grow and sell them to amateur growers. | Employed for 7 years with packing seeds. CSA-grower, will grow seed for the company for the first time this year. |
| | | Co-founder of the company & seed grower for 40+ years. Author of seed saving book |
| Farmers organisation, only member of LVC in Sweden. | Has been operating since 2010, has 50-100 members. Work mainly on an EU-level as Sweden's only member of ECVC. | Representative of ECVC in Brussels on seed issues, has had their role for the past 2 years. |
| Independent - long term perspective | Has worked with POM, the agricultural department, runs short courses in seed saving, author and co-author of book and reports on Swedish heritage seeds | Consultant, worked w seeds for 30+ years |
| The Board of Agriculture | The governmental body that regulates agricultural operations in Sweden. Under the umbrella the Swedish state and of the EU legal framework. Does not work directly with seeds but set rules, gives support (practical, monetary, legal etc) and advice. Acts as a channel for information. | Organic farming advisor, working with ´garden plants', collaborates with the seed unit e.g. funding opportunities in relation to seed production. |
| Association for herbs & medicinal plants | Member led non-profit. Set up in 1993, ca. 300 members. Main aim is to spread knowledge about herbs, their uses in the past in the present and future. No courses or such on practical seed saving but has a newsletter and yearly field visits. | President of the association for 18 years, hobby gardener, former teacher. Central holder of all the seeds and their distribution, main editor of the newsletter and the seed list. |
| Seed saving | Member led, non-profit, set up in in 1982. | Board member/former |

| | | |
|---|---|---|
| association | Today 3000+ members. Aims to preserve the diversity of kitchen garden and field plants. Offer seed saving courses to members | teacher/seed saver |
| | | Board member, seed saver and elder, influencer producing blog and podcast (with special sections on seed saving) |
| Grower community member | Perennial plant nursery, cut flower business & seed producers. Has potential plans to work with tree seeds in association with the small seed company in the same area. Wants to work with knowledge sharing in relation to seed saving. | Self-sufficiency farmer and small business owner. Began as a member of a seed association and as knowledge about the seed industry grew so has the interest to save own seed. Interested in creating local synergies and wider seed community. |
| Commercial seed company | Focus on heritage and heirloom seed as agrobiodiversity is their passion. Sells Swedish and European seed. Has seed saving advice and useful information and history related to seed. | Founder/grower/lecturer Is the only employee and run it as a side business to their full-time occupation. |
| Trialling commercial organic seed production aimed at professional growers and farmers. | Non-profit, farmer led research project run by an association and a grower's community of 8 professional food growers. Has published a practical handbook. Aiming to create a network and to further the knowledge. The aim is to scale up production for commercial growers by 2037. | Cofounder of association & 30+ years of experience in seed saving, member of the seed association/ worked for the gene bank/POM etc/author. Interested in heirloom and heritage seeds |
| | | Co-founder of the association, consultant, 40 years of experience as horticultural advisor. |
| Heritage grain association | Non-profit, member led. Set up in 1995, ca 500 members (mix of farmers, bakers, scientists, supporters, small scale food growers) Main aim is preserve heritage varieties and promote organic and regenerative methods and to spread knowledge. Has their own gene bank. | Membership coordinator/organic farmer for 22 years, sells seed as grain/flour. |
| | | Board member organic farmer and horse keeper, sells seed as horse feed |

| | | |
|---|---|---|
| Meadow seed company | Set up in 2006, family run, Mix of cultivated and wild collected seeds. Growers' community of 10 (+ themselves) across Sweden (for locally adapted seeds). Has invented/adapted a lot of their own machinery. | Grower and employee |
| The organic movement | Co-founder of the organic certification in 1982, has not worked with seed, but has a wider perspective that adds to the understanding of the seed movement. | Independent consultant, author with insight of the Swedish context. Organic farmer for 40+ years |
| commercial certified organic seed company (not Swedish seed) | Set up in 1984, sells seeds from hobby to large scale farming. Buy seed from Europe and trial all seeds themselves. Would be interested in Swedish seeds but there are none being produced in the quantities that they sell. | Co-owner, previously small-scale farmer now head of the company. Has previously worked with small scale farming. |

# Appendix III List of sites visited

| Location | Information about actor | Role of participants | Event/Activity/ attendants |
|---|---|---|---|
| Folk high school, Central Skåne | Offers multiple courses for students, of relevance is their programmes for Forest gardening, sustainable small scale food production and agroforestry. Work with seeds permeates all of these. A longer online course in seed saving is offered- | Teacher, grower, educator | Seed saving class (only for students at the school). |
| | | Multiple organisations | Seed day w Seed swap/knowledge sharing/social |
| | | Forest gardeners (closed to members) | Forest garden day (social/knowledge sharing)/seed swap |
| Exhibition at outdoor art centre, Österlen Skåne | The artist has worked and farmed buckwheat for many years, is a member of the heritage grain association. | The artist, a guest artist and members of public, staff from the art centre | Exhibition (a field of buckwheat) and an interactive art performance. Other events have/will happen in the field. |
| Farm and seedbank, Central Skåne | Regenerative farm that also hosts the Heritage grain associations seed bank. The farmer is cashier and steward of the seed bank. The artist has worked in collaboration with the farmer and the association for their PhD. | Farmer and artist + members of the public | Farm tour/seed bank tour/short trial of threshing seeds/fika. The visit is an extension of the exhibition. |
| Art Exhibition in Lund | The artist exhibiting is doing so as an end of their PhD thesis called Towards Peasant Cultivation of Abundance. | The public | Video installation, archival material, photo and highlighting the history of Swedish grain and the work of the Grain Association. |

# Appendix IV List of sites visited for tour and interview

| Location | Information about actor | Role of participants | Activity |
|---|---|---|---|
| Nut tree nursery | Started in 2022. Focus on increasing nut production in Sweden, involved with Agroforestry Sweden | Nursery founder and intern | Study visit/tour + fika and conversation |
| Forest garden nursery | Started in 2022<br>The founder is a part of a bigger project in the same site, including a perennial plant nursery. Began saving seeds as there was no one else doing it | Founder of the nursery and grower | Tour of the growing space and conversation |
| Gene bank | Started in 1979. Hosts all of Sweden's registered seed heritage. | Nordic Gene bank, members of staff from the different departments | Tour of seed storage, seed trial labs and field trials, interviews |
| Co-owned farm | Collectively owned farm, started in 2010, has 30-50 members today. A transition/self-sufficiency project. Seed saving is not a central activity but is a part of the farming. Seeds are saved for own use and is sold at events and online. | Members attending a workday. Some of the participants are knowledgeable of seeds. | Communal labour day at the farm & shared lunch |
| Commercial seed company | Set up in 2019. Has a grower community of 30. Are the only actor selling Swedish seed only for vegetable production on hobby level. Political in their positioning. Active on social media. | 2 founders, up until this year they have also been producing seed, but this year they are only doing administrative work. | Day of work in their office, germination tests, packaging seeds + conversations |

# Appendix V Factsheet


## Cultivating seed sovereignty

### Exploring the practices of seed savers in Sweden

**This fact sheet disseminates the sharing of knowledge, practice and cultivation methods of agro-ecological seed saving using Sweden as a case study. The study investigates the organisational models and what potential these practices hold for future food production in relation to seed sovereignty.**

Seeds play a vital role for farming practices across the world, yet in countries with highly industrialised agriculture, such as Sweden, the knowledge and infrastructure required to cultivate them is lost at large. Instead, food growers depend fully, or to a large extent, on the global seed industry where seeds are subject to ownership and intellectual property rights. In contrast to the agroecological perspective where seeds are a shared common, belonging to, and the responsibility of, everyone.

**COMMUNITIES OF PRACTICE**

There are a number of actors organising and employing diverse methods in regards to seed saving. Ranging between established associations, gene banks, new emerging networks of commercial scale production, skilled and engaged individuals to policy workers. There is not a unified movement working towards seed sovereignty in Sweden. Nonetheless the work carried out by the communities of this study shows a variety of crops and farming methods used that interlink with each other, in a wider landscape of practice.

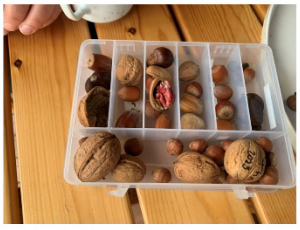
**CONCLUSIONS**

The study offers insights to the motivations for engagement and an understanding of the diverse and complex practices applied, rooted in a deep sense of care. A care where the seeds represent diversity in all forms and the possibility for a different food system that is based on agroecological principles is made visible.

**WAYS FORWARD**

The actors of the study have identified the hindrances and potentials of their communities, that can be addressed both by the see themselves and policy makers. Addressing them would enable the communities of seed savers at large to continue and develop their knowledge and skillset, a crucial aspect of agriculture. All levels of seed saving matters and is important as it is a direct, local and embodied way in which to engage with transforming the food system.





The type of seeds and the modes of cultivation vary greatly in the study, exemplified from three site visits (left to right ): *figure 1:* farmer and member of grain association standing in his field of heterogenous grain, *figure 2:* Forest garden producing perennial seeds. *Figure 3:* Selected nuts collected by tree nursery man.

**Cornelia Altgård**
**M.Sc Agroecology SLU**
Cornelia.altgard@gmail.com
+46704228737

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