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**RADICALLY LOCALLY**

**HOW FARMERS CAN HELP TO MITIGATE CLIMATE CHANGE AND PROMOTE A  
 POST-GROWTH SOCIETY**

Master's Thesis

M.Sc. Sustainable Entrepreneurship

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## ABSTRACT

The agricultural sector significantly contributes to global greenhouse gas emissions while playing a crucial role in combating climate change. However, the adoption of agroecological farming remains low, especially in the Netherlands. This study aims to analyze the factors that facilitate or hinder the adoption of sustainable farming practices in the Northern Netherlands and assess the farmers' entrepreneurial activities using degrowth principles. Exploratory qualitative research was conducted to gain context-specific insights, revealing various components that influence the voluntary shift towards sustainable farming practices. The main obstacle for both converted farmers and those willing to change is a small market with limited government support, leading to a lack of market confidence. Additionally, converted farmers are found to be strongly aligned with degrowth principles, driven by a desire to share value, expand their market, and align their sustainability innovations with stakeholder value creation. Direct distribution is one approach to offset the additional costs of production and make sustainable products more competitive. Close engagement with end-consumers through education and putting pressure on existing institutions is a systemic approach. By implementing low-input practices that improve soil health and actively shaping local chains, these sustainable entrepreneurs lower the overall metabolism in agriculture, educate and foster convivial communities, and promote wealth redistribution. Thus, degrowth entrepreneurship in agriculture plays an instrumental role in mitigating climate change.

**Keywords:** sustainable agriculture, degrowth, agricultural transition, agroecology, localizing, local value chain, agrifood system, post-growth society

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## INTRODUCTION

Maintaining current levels of activity would require 1.6 worlds and shows the urge to shift away from overconsumption and exceed ecological capacity (1). Simultaneously, wealth disparities, inequalities, and poverty have significantly worsened in recent years, while the richest 1% have accumulated almost twice as much wealth as the rest of the world combined (2). In response to the intertwined economic, environmental, and social challenges, transformative changes to the prevailing capitalist system become imperative (3). Not even strategies such as ‘green growth’, ‘sustainable growth’, or the European ‘green deal’ seem sufficient (4,5) to avoid potentially irreversible thresholds that may destabilize the Earth system (6). Opponents argue that unlimited economic growth cannot be decoupled from environmental harm through technological innovations and efficiency (7). This may even offset rebound effects, where gains in sustainability and efficiency can lead to increased consumption. Critics highlight that unlimited economic growth is not compatible with the ecological limits and hence argue for more transformative practices that include socio-economic changes (7). Alternative models that call for a paradigm shift are emerging, such as the concept of degrowth (3,7). Degrowth is a socioeconomic theory and movement that challenges the idea of current economic growth at any cost and prioritizes human well-being, sustainability, and social equity over perpetual growth (7,8). Its strategies aim to downscale resource consumption in industrialized countries for a steady-state economy or post-growth world (9). Put differently, it is defined as “a voluntary transition towards a just, participatory, and ecologically sustainable society” (10, p. 254). The Beyond Growth Conference held at the EU Parliament (11) and the invitation of Jason Hickel, a degrowth thinker to address the Dutch Parliament (12) are examples showing that the criticism of growth and the pursuit of post-growth societies have entered public discourse (13).

The current international food supply is characterized by large distances, resulting in high emissions, anonymity, and neglect of negative externalities (14). With an estimated one-third of greenhouse gas emissions attributable to the food system, of which agriculture and land use account for 71%, agriculture is a critical factor in combating climate change (15). Simultaneously, climate change is putting farmers at risk on top of that (16). The agricultural sector in The Netherlands is of particular interest, built on the growth paradigm (17). Their diffusion of organically farmed land is relatively low compared to other European countries and can be traced back to a neoliberal political discourse in the 1990s, which focused on export and competitiveness and continues to have an impact until today (17). Given the expected increase in food demand to meet the needs of a growing population, as well as the demand for more bio-based non-food materials (18), the importance of degrowth for alternative agri-food systems becomes clear (13). This is not finger-pointing at farmers, but about a discourse that encompasses our food system, politics, agriculture, business, and society. Sustainable agricultural entrepreneurship can be instrumental in helping to stabilize the climate (19). In this context, farmers can be seen as entrepreneurs, driving positive change in the agricultural sector.

While degrowth in agriculture generally encompasses the entire agri-food and fiber production chain, involving multiple actors from production to consumption or disposal (20), this study specifically concentrates on primary production, hence the adoption and retention of sustainable innovations. Although there is emerging literature attempting to apply degrowth principles to specific industries like agriculture, existing literature in this field remains conceptual (13,21,22). To fill this gap, this exploratory study aims to comprehend the factors that influence the shift toward sustainable farming practices in the Northern Netherlands, with a specific emphasis on restorative principles. By combining degrowth and agriculture and the

emphasis on the need for a societal transformation to achieve effective climate mitigation, this qualitative study sheds light on farmers' entrepreneurial activities from a degrowth perspective. It recognizes the voluntary nature of sustainable transitions in agriculture and addresses the argument that technological solutions alone are insufficient for ensuring a safe operating space for humanity (23). Eventually, this study aims to contribute to the ongoing efforts of translating degrowth principles into specific industries. The research question guiding this study is as follows:

*“What enables(ed)/hinders(ed) farmers of the Northern Netherlands adopting and retaining sustainable farming principles from a degrowth perspective?”*

The case company House of Design (HoD) has developed a post-growth fit local value chain model following their philosophy of producing bio-based products locally and thereby creating demand for alternative crops while raising awareness by involving all stakeholders from the beginning (24). Their specific focus is on the fiber production of flax. In light of this, the following sub-question emerges:

*“How do sustainable farming practices and flax improve soil, personal and economic health and what does it add to regenerative farming?”*

## THEORY

### Degrowth in Agriculture

Given that economic growth is heavily driven by business operations, the involvement of corporations in transitioning to a post-growth society presents a demanding issue (25). In recent years, degrowth has emerged as a growing stream in literature that explored alternative sustainable business models and practices (26). It examined governance structures, the relationship to profit, and the purpose of business, aiming to transcend the sole measurement of success based on economic factors (25,27). Degrowth proponents argue that relying solely on technological solutions is insufficient to ensure a safe operating space for humanity. To achieve effective climate mitigation a societal shift is required (23). Today, the discourse on degrowth is much broader and increasingly touches on specific economic sectors such as tourism, housing, and agriculture (13).

Degrowth research in agriculture builds upon dominant central degrowth concepts of sufficiency and technologies but also takes social movements, equity, care, and indigenous knowledge into account (21,23,28). From a technical perspective, degrowth in agriculture aims to downscale the overall metabolism by shortening production chains, using renewable energy, implementing bio-based cycles, eliminating agrochemicals, and achieving self-sufficiency at the local level (28–30). Further theoretical discussions are exploring appropriate agricultural technologies and techniques for degrowth, raising debates around organic agriculture and the inclusion of GMOs (28,31). Infante and Gonzalez (32) assessed the Spanish Agro-Food system from an energy-efficiency perspective and derived four possible courses, namely re-territorialization of production, re-localization of markets, re-vegetarianization of diet, and



re-seasonalization of food consumption. Others have applied degrowth and sufficiency principles to transform the food system into a sustainable, steady-state food system that enhances food quality and human well-being. These transformation strategies include reducing animal protein demand and overall throughput, implementing efficient resource allocation through emissions pricing, and promoting wealth redistribution (23,33).

Another perspective of degrowth is the sociological one – growth is anchored deep within our society leading to ‘growth lock-in’ or perceived decline in well-being (34). These economic, social, and political structures must be well understood when moving away from the current state (34). To address these structures, recent studies have mapped the field of degrowth in the agri-food system by approaching particular disciplinary perspectives (13). In their book, *Food for Degrowth*, the authors highlighted particularly the social aspect of community participation, but also the influence of growth narratives and resistance to alternative food systems based on environmental- and social justice (30). Gerber (22) also refers to the growth paradigm, exploring the commons of critical agricultural studies and degrowth. Drawing from the existing literature, a recent conceptual study by Guerrero-Lara et al. (13) proposed a future research agenda that deepens, expands, and diversifies degrowth research on agri-food systems, focusing on four areas: advancing the conceptual understanding of degrowth, exploring theories of sustainable transformations, examining the political economy of degrowth agri-food systems, and investigating the relationship between rurality and degrowth. Finally, to avert climate-driven disasters, overcome the growth paradigm, and redefine humanity's interaction with nature, McGreevy et al. (21) call for a redesigned agrifood system. This post-growth agrifood system is based on principles of sufficiency, regeneration, distribution, commons, and care. It is supported

by coordinated education and research that challenge dominant discourses and envisions a post-growth world where agroecological processes foster healthy communities.

Applied, mostly microeconomic, studies in the European context emphasize the significance of small-scale community-supported agriculture as an example of deep-scaling sustainable entrepreneurship (35–37). These approaches involve partnerships between producers and consumers that focus on sustainable, local production and consumption. Furthermore, emerging materialist-critical movements, including the ‘back-to-the-land’ movement (38), individuals without prior agricultural background transitioning into farming, or the concept of ‘half-farmer, half X’ (39), are noteworthy. The latter combines sustainable food provision with an additional income-generating variable X, drawing on food, flexibility, and fulfillment. Although there can be further debate about their feasibility in the current system (40), these lifestyles challenge growth-driven agricultural practices and emphasize sustainable food provision, lower metabolism in food production, and a restored relationship with food, place, and seasons (39).

### **Sustainable Farming Practices**

Modern agriculture prioritizes short-term growth and high yields, accompanied by high energy inputs, toxic fertilizers, and the neglect of planetary boundaries (41). This approach has led to unhealthy soil in 60-70% of Europe, which threatens the ability to withstand climate events or socio-economic factors such as city expansion (42,43). Healthy soil is essential for supporting life on Earth through its ability to provide a range of ecosystem services, including improved water retention and carbon sequestration, which promote environmental resilience,

biological productivity, and advancing plant, animal, and human health (43,44). Several sustainable agriculture principles are (re)gaining importance, focusing on soil health and moving away from linear, heavy-input systems toward more holistic, self-regenerating approaches (45). Although it is not always possible to distinguish all practices from one another (45), the main features of each principle are briefly described below.

Principle	Description
Agroecology	<ul style="list-style-type: none"> <li>● Integrating approaches: crop diversity, crop rotations, crop coverage, reduced tillage, agroforestry systems and, (country-dependent) livestock into the overall system to promote biological synergies and thus the pursuit of healthy soils.</li> <li>● An alternative production paradigm, holds various natural, low-level inputs methods that prioritize biological efficiency and activity, through diversification of the farming system (41).</li> <li>● Exact technological forms vary, depending on the biophysical and socio-economic conditions of the farmers / the region (46,47).</li> </ul>
Regenerative Agriculture	<ul style="list-style-type: none"> <li>● Holistic, climate-smart approach.</li> <li>● Relying on agroecological principles.</li> <li>● Often positioned at opposite ends of the farming spectrum (48).</li> <li>● The aim is to go beyond sustainability, to restore ecosystems and to foster systemic positive climate mitigation effects, contrary to the extractive current system or sustainability (sustain status quo) (45).</li> <li>● The resurgence of interest in regenerative agriculture however often combines previously divergent approaches, namely agroecology and sustainable intensification, which may lead to public confusion (48).</li> </ul>
Organic	<ul style="list-style-type: none"> <li>● Aims to produce environmentally-friendly agricultural products.</li> </ul>

	<ul style="list-style-type: none"> <li>● Promotes responsible energy use, biodiversity preservation, water quality maintenance, soil fertility enhancement, and animal welfare.</li> <li>● Specific standards for production, processing, and labeling (49–51).</li> <li>● Not all organic practices are ecological, while ecological practices are often synonymous with organic practices, as organic may still rely on monocultures or external inputs (46).</li> </ul>
Biodynamic	<ul style="list-style-type: none"> <li>● Follows organic principles while imposing additional rules.</li> <li>● Closed-loop one-health concept that promotes systemic environmental efficiency for soil and human health.</li> <li>● Integrated livestock (country dependent), composting, and specific preparations (52).</li> </ul>
Flax	<ul style="list-style-type: none"> <li>● Frugal crop, requires few inputs, suitable for the context of The Northern Netherlands.</li> <li>● Versatile use in the industry, can strengthen a (regional) bio-based circular economy, in line with EU policies to promote non-food crops.</li> <li>● Suitable for crop rotation, can therefore possibly contribute to regenerative approaches (48,52).</li> </ul>

Table 1: Sustainable farming practices overview

Adopting agricultural practices focusing on soil health and biodiversity is complex, knowledge-intensive, and context-specific (48,53). Such transitions are long-term processes that change the underlying socio-technical regime at different dimensions (17). Since such regimes are highly intertwined and often deeply anchored in society, the next section identifies diverse factors that influence the voluntary transition towards degrowth principles in agriculture.

## **Analytical Framework**

The interplay of nonmaterial factors, such as values and cultures shapes agricultural transformation alongside technological innovations and policies. These factors create "traction and friction zones" at political, practical, and personal levels, influencing the challenges and facilitation of agricultural change (19). Moreover, biophysical, economic, and socio-psychological factors that influence the diffusion of agricultural innovations are highlighted (54). Building on the complex, systemic nature of scaling agricultural innovations (55), a range of influencing factors in the Dutch context were identified. Research on the acceleration of the organic dairy industry revealed the lack of adequate market formation, policies, and financial support, considered as hard institutional failures. Divergent visions on economic growth, culture, or habits, defined as soft institutional problems are further influential components (17). In studying Dutch farmers' transition to agroecology, the importance of "inner dimensions" for sustainable change was emphasized. Understanding these intrinsic motivations guides effective educational programs and policies, acknowledging the complexity of their success (56).

Lastly, the five capitals framework presents known drivers and barriers for farmers and serves as the base of this study. These capitals go beyond their financial connotation and demonstrate significant influential factors for farmers (45). The factors identified for the Dutch context led to additional influential components around which the five capitals were adjusted accordingly. This ultimately resulted in the following capitals: social, human, natural, financial, and market capital. These five capitals form the reasoning of this research and are briefly

described below.

Capital	Description
Social Capital	associated with values, cultures, and relationships with communities, families, or formal networks such as advisors and plays a fundamental role in advancing behavioral change and soft institutions, which includes new voluntary practices (57,58).
Human Capital	encompasses education and experiences of the entrepreneur and is positively connected with the ability to acquire and leverage information and to adopt new practices (57,59).
Natural Capital	Among farmers, <i>natural capital</i> stands out as one of the most vital assets (60). This refers to the stock of ecosystem services, ecological features, or resources that sustain soil and human well-being, to also potentially hand it down to future generations (45,61). Additionally, “ownership may matter for stewardship” (45, p. 20) to integrate ecological practices.
Financial Capital	comprises various economic resources such as savings, cash, credits, or other financial tools used as incentives. They do not act as the main motivation to change practice but can drive hard, technical innovations (e.g. tractors). Used as incentives, they however can often have an opposite effect and undermine intrinsic enablers.

Market Capital	builds upon the economic factors and external influences that impact the demand, competitiveness, and regulations within a specific market. This includes hard institutions such as laws and regulations, limited demand from processors and consumers, insufficient stimulation by the government in the retail sector, and competition from foreign markets (17).
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Table 2: Synthesized five capital framework

To shed light on the transformation process from a degrowth perspective, three criteria further serve to frame the questions, which are 1) repurposing the business for the environment and society, 2) promoting the societal acceptance of degrowth thinking, and 3) collaborative value creation. These criteria are derived from the works of Hankammer et al. (25) and Khmara & Kronenberg (62) that established guiding principles for companies approaching degrowth. The first two criteria aim to help the society and environment in general and were chosen due to their strong degrowth focus of de-emphasizing profit maximization in favor of a focus on benefits for the community and the environment. The third principle touches upon collaboration, conviviality, and localism, representing relevant degrowth criteria also in agriculture as identified in the sections before.

The synthesized analytical framework including the data from the literature can be found in Appendix A.

### **Sustainable & Institutional Entrepreneurs**

Entrepreneurship driven by change agents serves as a mechanism to connect different contexts and drive change (63). Given that farms play a crucial role in applying degrowth

principles, farmers act as sustainable entrepreneurs (SEs), connecting their entrepreneurial activities “to the achievement of positive effects for the natural environment and humankind” (64, p. 665). The activities of SEs are influenced by an underlying system that shapes entrepreneurship, and market structures are essential for their success (63,65). SEs face the uncertainty of successfully aligning their innovations or business models within the given context. Disregarding motivations and success metrics, SEs must commercialize their innovations and shape markets to generate significant benefits for manifold stakeholders (64).

Institutional Entrepreneurs employ underlying institutional logics and navigate processes at individual, organizational, and societal levels to drive new forms of organizations or institutions. They actively leverage resources to shape and transform the structures that surround them to achieve their strategic objectives (66). In other words, they can shape a market.

## **METHODS**

### **Research Design**

The theory of degrowth in agriculture is nascent and the research problem is complex, characterized by context-specific determinants. This necessitates a system understanding. Given that agricultural transformations encompass more than technological changes and involve shifts in values or traditions, a qualitative approach allowed exploring ‘why’ the transformation has



occurred/might happen and ‘what’ aspects influenced such shift and retention (67,68). For context-specific insights, the case company House of Design (HoD) in Groningen, The Netherlands, proved ideal. HoD operates a local value chain model that addresses environmental and socioeconomic challenges through the production of local, biodegradable products and stakeholder engagement. They emphasize small-scale initiatives, foster regional impact in The Northern Netherlands, and open-source knowledge sharing.

Therefore, to answer the research question, exploratory qualitative research seemed most appropriate, relying on semi-structured interviews. These allow for a free flow of conversation but are guided by the interview-guide (Appendix F) (69). Eventually, the synthesized analytical framework (Appendix A) served as abductive reasoning.

### **Data Collection**

To obtain data, farmers of the network of HoD were asked about their experiences of adopting/thinking about sustainable practices and their incorporation of degrowth-inspired entrepreneurial activities. Since HoD focuses on adding value to flax, specific questions were formulated about this crop. Participants were selected based on their varying stages of transition to derive a holistic understanding, as well as their proficiency in English. A detailed description of each farmer can be found in Appendix B. After six interviews, data saturation was reached. Semi-structured interviews added significantly to the understanding of how entrepreneurs are influenced by the introduction of sustainable practices and the embedding of degrowth principles.

The interviews lasted about 45 minutes. Four interviews were held in person at their farms, one was via phone due to time constraints, while the sixth farmer preferred to answer via

mail due to language barriers. The interviews were conducted in English between April 24th - May 12th, 2023. Before the actual data collection started, the participants were informed about the consent form (Appendix E) and asked about the allowance to record, ensuring all information was well understood. The ethical standards of the University of Groningen were respected for conducting this research.

### **Data Analysis**

Afterward, all interviews were transcribed using the software otter.ai. In the first read-through, the data was reviewed to familiarize with it, identify differences and similarities, and highlight relevant quotes (57). To ensure all valuable data was considered, the process of reading and highlighting was repeated.

To structure the data, Atlas.ti was used. First, all highlighted quotes got labeled, formulating initial descriptive codes following an open coding process. The next step was to try to raise all descriptive codes to a higher level, assigning them accordingly to the conceptual codes. The capitals and degrowth criteria identified in the literature underpin the theoretical framework of the study and formed the basis of the conceptual codes. Following this axial coding process, relevant data that contributed to answering the research question, but could not be directly linked to the theoretical framework, were categorized based on their latent patterns and ability to provide broader explanatory power (70). This way, six more conceptual codes were identified, ensuring that they are not overlapping and mutually exclusive. Finally, all marked data was read again and checked if all are assigned accordingly and traceably. Once all relevant data could be related to conceptual codes, three second-order themes were derived that construct the theory. The resulting coding tree was illustrated in Excel (Appendix C).

## **Data Quality**

This study is strengthened by a rigorous examination of relevant literature, which enhances its credibility. The methodology section has been meticulously developed to ensure both replicability and transparency. Additionally, the researcher made efforts to minimize potential biases and ensure the validity of the findings (71). To conduct the interviews in good faith and reduce the risk of bias commonly associated with face-to-face interviews, suggestive questions were avoided, and the interview questions were closely aligned with the interview-guide (71).

## **RESULTS**

First and second-order codes were derived during the coding process. They form three themes according to which the results to answer the research question are presented below. One research goal was to find out factors that have facilitated or do hinder the adoption and retention of sustainable farming practices.

### **Drivers / Barriers**

Personal readiness is found to be key to overcoming the many obstacles encountered in changing/maintaining the practice. Additionally, several factors could be identified to answer the

research question. The results clearly show that each of the identified capitals can go strongly in either direction, facilitating a transition or being difficult to overcome. Additionally, an interplay of several capitals was determined, which makes ranking difficult. The observed capitals are therefore all relevant and are visualized in Appendix D.

***Social Capital.*** Social Capital facilitated and catalyzed the transition, while equal hindrances from social/formal networks and profit-oriented values were observed. Intrinsic motivation played a critical role for converted and converting farmers<sup>1</sup>, aligning actions with personal convictions, values, and passions. Notably, values like ‘Frisian stubbornness’, love for nature and birds, pursuing a fulfilling life, risk-taking, and a commitment to not go “*somewhere in the middle*” (F2) helped to overcome the conventional paradigm. Some farmers were driven by a social mission:

*“I really think we have a purpose in society but it's not producing a lot of cheap (...) food.” (F2)*

The local social network, encompassing friends, family, or neighbors, provided fundamental support and inspiration. Colleagues were particularly helpful during transitions. Neighbors and knowledge exchange encouraged experimentation, even among more conventional farmers to embrace ideas like stop plowing: “*And I wanted to try it myself and I think it's easy.*” (F5).

Overcoming obstacles from social/formal networks is challenging. Many farmers emphasized that there are, of course, some farmers who refuse to adopt sustainable practices, or

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<sup>1</sup> In the following text, the converted farmers will be referred to as SEs. Farmer 5 is stated as conventional and F1 as converting and ecological-conventional. If the term ecologically-oriented is used, F1 is included but not F5.

perceived feelings of resentment between ‘good and bad’ farmers arise. However, there are also those willing to change, and long family histories can influence change avoidance to avoid responsibility for potential failures. Likewise, the formal network can hamper change:

*“And when you have a fairly good conventional advisor, it's very hard to get away from” (F1).*

**Human Capital.** Human Capital, encompassing experiences and education, played a crucial role in the transition to sustainable farming practices. Accessing information and knowledge about certifications, turned out to be most challenging, as experienced by F4.

Experiences have played a significant role in shaping F1’s curiosity and questioning of dominant agricultural practices. F3, for example, learned about regenerative agriculture while traveling and was given the opportunity to farm 50 hectares in a regenerative, organic way. That both enabled their adoption.

Although there are good organic institutes (F2) and enough valuable knowledge (F1), the prevailing formal education and dominant knowledge are still perceived as conventional, as also shown by the trainees of F2. F1 acknowledges the need to be proactive and act on this knowledge and the effort to find the right information for their needs. He further states *“you need to be ready for yourself”* to access the knowledge and exploit the information to transform, while some *“don’t want to get it”*.

*Natural Capital.* Natural Capital, including soil health, ecosystem services, and other related resources, is one of the most fundamental capital assets for these entrepreneurs. Among those farmers, who have not yet fully embraced ecological health, exists a growing recognition of the need for sustainable practices. This awareness is driven by concerns about the future viability of their farms and the desire to pass them on to the next generation.

*“I had diseases and the price dropped. Big time. So you want to do things better” (F1).*

With just those, however, natural setbacks or quality changes can favor unsustainable patterns to save the crop, as F1 critically reflects in regards to the rainy April this year *“so I spray too much right now for my liking”*. And also F5 found that, although slowly, his organic matter increased, the potatoes then got pox, which negatively affects sales. This led him to use more inputs again, while the SEs searched for sustainable alternatives, such as resistant potato varieties in the face of nature/weather setbacks.

The deficit that nature does not have a value yet, is something that ecologically-oriented entrepreneurs emphasized. This results in less competitiveness for those prioritizing biodiversity. Mentioned proposals to improve this were financial indicators linked to soil health.

*“Everybody wants nature or better environment, but nobody wants to pay... You have to put a price on it.” (F3)*

Lastly, *“to be more compliant to invest in [soil health]” (F1)*, ownership or at least long-term leases are found to be fundamental for all ecologically-oriented entrepreneurs. This

supports attachment and a greater willingness to invest in resource-intensive and lengthy practices in soil health. Contrary, the conventional farmer owns most of the land and still uses agrochemicals.

*“I need at least a certainty of five years, five, six years to do something.” (F4)*

**Financial Capital.** Depending on the initial soil conditions, transitioning to sustainable practices can lead to decreasing yields and additional costs, making it financially challenging for farmers, as mentioned by converted farmers. This financial aspect has made Farmer 1 hesitant to embrace the transition fully. To overcome this phase and sustain their practices, farmers often “add a lot of money” “to keep the farm going” (F2). Financial support is limited and not easily accessible. Saving money that “I can invest in my soil program” (F1) or adoption for gradual expansion are approaches most often noticed. Investing in new hard technologies for organic farming incurs additional costs.

Financial incentives can serve motivation for entrepreneurs, as highlighted by Farmer 4, who collaborates with fellow farmers and European funding to preserve bird populations. The number of participating farmers is increasing. Although there is a growing awareness of biodiversity, monetary incentives can change the nature of their motivations.

*“But on the other hand, if you put money on it, it becomes another thing. So that's well I'm not always glad with that because (...) well there are other things that are important” (F4)*

Although financial challenges are acknowledged and support is desired, financial capital is not identified as the main driver or barrier in the transition to sustainable farming practices. Farmer 4 suggests that demonstrating how nature can be financially profitable, by showing and not telling, is essential to encourage others to make the shift.

*“And I think that's the best way to show other farmers to do it yourself. And that they, they come around here and they see it, and I don't have to tell them, you have to do it.”*

**Market Capital.** Market capital has the most codes assigned. Alongside that, this factor proved to be the most challenging for those that have transitioned. The small organic market, declining demands from abroad, and the non-competitiveness of organic products posed significant difficulties for financial security, especially while maintaining the same business model.

*“Farmers basically have the same business model but then organic, that's quite small. So it's not that easy to change.”*

Furthermore, a lack of confidence in the market among friends and fellow entrepreneurs hinders the shift. Farmer 2 expressed concerns about the impact of organic farmers entering the market when the market conditions remain the same, stating that it is not a healthy situation.

*“Because when the market stays the same, every organic farmer that gets onto the market is a problem. And that's not healthy”*



The historic example of flax cultivation highlighted how farmers adapt to market demand. When demand for flax decreased, farmers in the region ceased their cultivation. The lack of policies for processors to create a market, VAT reductions, and misleading advertisements that prioritize cheap prices over education were identified as factors that affect demand, referring to situations in other European countries. The small market primarily caters to the production of cheap food, and some farmers understand, not support, the use of fertilizers in this context.

### **Degrowth Principles**

*Repurpose the Business for the Environment and Society.* The aim is to analyze their relationship to profit and understand why environmental missions and qualitative growth over profit maximization were prioritized or did not occur.

Personal convictions, dissatisfaction with the old job, passions, and the acute nature of climate change were the main reasons for changing the business. Due to the negative impacts on the environment, soil health, animals, and people (F6), most farmers have stopped or reduced the use of fertilizers and herbicides. Further responsibility became evident to preserve the ability to farm for the next generation (F5). The ones well-advanced with sustainable practices mention that if someone wants to get rich, it is not with (this kind of) agriculture. Being green but profitable is important, and also helps to avoid frustration and abandonment of ideals (F3). However, instead of profit maximization, savings from conventional farming “*I can invest in my soil program*” (F1). A step-by-step approach has also been recognized in others through

self-investment. Even in organic, F2 felt the pressure of the large-scale farming paradigm which moved him to biodynamics.

*“and I was organic and there was still a lot of pressure of producing a lot. For sure it's organic but a lot of organic farmers still have the ideas of big farms, big practice.”*

F3 argues that a different business model is needed, especially concerning the small market. As part of his regenerative project, he sells directly and grows only what is ordered beforehand to strive for principles of sufficiency and at the same time overcome the paradigm. The efficient pursuit of high yields is still the success factor for one farmer, even if he has decided through a personal setback to remain at a certain size.

*“I need to be sure. Otherwise we're still in the same paradigm, right? (...) I need to know how much land I need to plan for you. I don't need to produce something which I'm not able to sell. Then I can better save my land or save the fertility of my land for another year or for the future.” (F3)*

**Promoting Sustainable Thinking** shed light on how the participants engage in societal acceptance of degrowth thinking and contribute to the adoption of new approaches by sharing values, building coalitions, putting pressure on institutions, or raising awareness at a societal level. All farmers share their knowledge and values with colleagues to inspire and encourage. While the less sustainable farmers engage little beyond that, the already sustainable ones actively

pursue leading by example and demonstrating the benefits of sustainable agriculture to nearby farmers. F4 believes it's more convincing to show the farm and the numbers and not talk about what is best to avoid rising feelings of resentment and finger-pointing. On a societal level, F3 aims to demonstrate that sustainable agriculture can coexist with food availability.

*“And then I was like okay, so I have the possibility to farm 50 hectares that I can really show that it's possible to farm in a regenerative, organic way and still feed the world.*

*This is always the biggest argument. Ridiculous.” (F3)*

F3 facilitates healthcare institutions' access to sustainable menus adapted to their capabilities while F4 promotes biodiversity and organizes cooperation with the government and a growing number of farmers. Although he acknowledges that a certain percentage of farmers can never be reached, awareness and exchange about birds/insects have improved.

*“Birds are a very good mechanism to bring farmers into biodiversity or sustainability”*

Some farmers are actively talking to (local) politicians to draw attention to, for example, support for leases during the transition phase, or the conversion to organic, local products in public institutions. Unequal chances of having a voice in negotiations in The Hague were also communicated directly. In some years, F2 intends to become active at the political level. Research into the extent to which organic food is healthier is also specifically commissioned (F3).

At the community level, strong consumer involvement in terms of education is something that all converted farmers have in common. This includes always having an accessible farm for everyone, inviting schools and ‘wwoofers’, or on-farm events to educate about the food system/environment.. According to F4, educating everyone is crucial. It’s “*not just farmers*” that rely on nature to produce products which then need to find ways to minimize the impact while keeping prices affordable. It requires a collective effort from all to make changes.

***Relocalizing.*** At a community level, collaboration is practiced to (re)connect and localize activities. In addition to informal cooperation and trading among farmers that all six maintain, ecological-oriented farmers are actively involved in several, smaller local projects, emphasizing that only collectively can you challenge a required system change. The advantage they see over the government for certain projects is that they know each other and the region. A common project of three farmers “*together as a cooperative*” (F1) with the case company, is a local value chain, where stakeholders along the whole value chain work together on solutions or education to achieve the necessary systemic change. Encouraging more locals to buy regional and organic food is also becoming more important considering the market development. Currently, most organic products go to Germany, but “*the Germans are growing their own products now. So we have to get more local people*”. (F2), That requires a lot of work, because often not even the people near the fields buy their products. Nevertheless, he intended:

“*From conventional to organic, organic to biodynamic and now we're trying to make the switch from 90% export to 90% local.*” (F2).

F3 is also actively expanding short chains, which for him means overcoming an old paradigm. For example, distributing healthy food in cooperation with local companies, and healthcare institutions is mentioned. He further states that with local chains the importance of certifications can decrease as *“you're no longer anonymous. Your customers can come and see how the products grow”*. Transparency and trust - words that are often mentioned.

Further to educational work, the aim of relocalization is to be achieved through the development of convivial communities, cooperation with public institutions, own (web-)shops, or local small-scale businesses. Whereas before it was not known what the industry produced from the milk, this also helps to re-establish the connection to the origin of the food, for both sides, as F4 impressively describes.

*“Now my neighbor says, ‘What a nice cheese you're making.’”*

## **Sustainable Life**

Further data revealed specific insights into the practices they stopped, the individual approaches they adopted towards more sustainable farming, and what it adds to their soil, personal, and business health.

***Regenerative Agriculture.*** This is a concept that all farmers recognize as subjective. For some, the terminology is broad or not entirely clear (F5). F2 and F3 actively follow (most) principles of regenerative, thus showing at the same time that it does not preclude high yields. F2 still takes a critical view of the assessment basis and advocates consistent agriculture that

dispenses with fertilizers. F1 knows a lot about ecosystems, aiming to “*make the system more efficient*”, but excludes certain principles such as agroforestry or permaculture for himself:

*“That's not where I want to go with my farm. But what I want to do is to make the soil so healthy that I can grow healthy crops, which I don't have to spray. That's for me a big thing.”*

***From Conventional Practices To Sustainable Alternatives.*** Steps that all farmers are already taking concerning soil health are to refrain from tillage, cover crops, and reduce the pesticides of those they still use. Solar power is used to store the harvest and F6 neither lights nor heats his greenhouse. During the transition, increased usage of manure was often identified.

F5, which measures sustainability based on inputs and outputs, argues that organic farming can be input-intensive. He believes that RoundUp is “*the best pesticide*” due to its effectiveness in small doses, although he tries to minimize its use. Other measures he implements include field covering and planting flowers at field edges, which promote biodiversity, incur minimal costs, and reduce pesticide leaching. F1 experiments with various micronutrients, compost teas containing nitrogen-fixing microbes and “*secondary metabolic compounds in plants. That was really an eye opener for me*”, as he aims to achieve healthy soil, plants, and fewer diseases without fertilizers so “*I don't have to interfere*”.

***Business Health.*** The current market is so small with farmers bearing extra costs in favor of nature or limited profitability during the transition, their products are often not competitive in the current market. Many farmers face high costs and limited profitability. A different business model is required, especially for regenerative farming. Selling directly or short value chains are

approaches mentioned by all ecologically-oriented, “*then it's possible*” (F1). Farmer 3 expressed this challenge by stating,

*“If you want to farm regeneratively, in my opinion, you need a new or different kind of business model than what is now the status quo”*

**Soil Health.** Since F4 had minimal chemical use before, hence good soil condition, the improvements are not directly measurable for him. F1 has observed improvements in plant health and soil quality, by measuring, for example, Brix and noticeable changes such as reduced wetness and stickiness, acknowledging rebuilding soil life takes time. F2, F3, F4, and F6 continue their practices without chemicals, ensuring long-term soil usability (F6) and achieving “*potatoes better than ever*” (F2). As for F5, the observation period is still relatively short since he stopped plowing and fertilizing less than three years ago. While he sees a slow increase in organic matter, he also notes negative effects on potato quality and is still making adjustments.

**Personal Health.** “*Because if you change your farming practices, you will treat yourself differently.*” (F1)

Personal success indicators mentioned include the ability to make one's own decisions, living by personal values rather than being overly influenced by others, or finding fulfillment in working with and for nature despite challenges. F2 has also prioritized the use of ecological materials during house remodeling, and some participants mentioned dietary changes such as reducing meat consumption. F5, following a health setback, has come to realize that prioritizing

growth at the expense of health is not ideal, stating, *“At first I wanted to grow as big as I could, but now I'm doing a little normal.”*

**Flax.** Flax as a specific approach was highlighted to see what it contributes to mentioned aspects. The impact of flax cultivation on soil health is still uncertain after three years. However, crop rotation is *“always good and it's a complete other plant family. So that is precious”* (F1). Cultivating flax sustainably is of course crucial, and can influence the quality. Farmers (F1, F2, F4, F5) express varying perspectives on the potential of adopting flax. While F4 and F1 highlight risks and hesitations related to arable farms and grain crops, they acknowledge the potential of short value chains and value addition. Exporting crops is not a viable option, emphasizing the need for successful local market development. The main concern raised by F2 is the ability to sell crops at a good price. Additionally, F5 observes a growing trend in the construction industry and remains attentive to the crop's profitability compared to winter wheat. The key considerations for farmers are ensuring sustainable financial viability and market demand for the adopted practices.

*“We're farmers, we can grow anything, but we have to sell it”* F2.

## DISCUSSION

This study aimed to understand the factors that hinder(ed)/enable(d) farmers to adopt and retain sustainable farming practices in the context of the Northern Netherlands, looking at it from



a degrowth lens. Therefore, questions were asked about how they engage in the promotion of sustainable values and agriculture, collaboration, and re-localization. Finally, questions about the extent to which a shift can contribute to soil, business, or private health and about flax-cultivation specifically were framed. To answer this, exploratory, qualitative research was conducted that allowed access to context-specific insights. Results were generated by interviewing six farmers at different stages of transition, relying on semi-structured interviews. The answers are summarized below, followed by subsequent limitations of this study.

### **Drivers / Barriers**

First, five capitals were identified that both facilitate(d) or hamper(ed) the adoption/retention of sustainable farming practices.

According to Bakker et al. (56), the 'inner dimensions' were found to be fundamental reasons to voluntarily convert and retain practices, motivated by social capital, personal values, and beliefs, even at the expense of, at least short-term, financial gains. In alignment with Pinto-Correia et al. (72), local social networks acted as catalysts, providing inspiration, support, and knowledge. Simultaneously, transitions can also be hindered by social/formal networks or values such as profit maximization.

Moreover, the SEs human capital, encompassing experience and education, was linked to the ability to acquire and adopt new information and practices (59) and is closely linked to someone's social capital. Especially concerning the prevailing, conventional education or

accessing knowledge on organic certification. In addition, personal willingness to seek sustainable information/advisors is noted, which in turn can become an integral part of one's social network.

Soil health is crucial for entrepreneurs (60) and degradation, concerns about it, or passing the farm to the next generation, have driven the adoption of sustainable practices (45), particularly among the conventional and not fully converted farmers. With just those, natural setbacks can favor unsustainable patterns to protect crops, while the SEs remain committed to their values. Furthermore, ownership or long-term land leases are found to be fundamental for the entrepreneurs (45), fostering attachment and a greater willingness to invest in resource-intensive, lengthy practices for soil health.

The transition to sustainable agriculture is challenging and requires significant investments (73). It is a lengthy and demanding process, and farmers often face high costs while receiving conventional prices. Financial incentives can stimulate, especially financially oriented entrepreneurs, but are not the main drivers and can even undermine intrinsic values (45). Those converted were motivated by an intrinsic desire for conservation (23). However, support during this phase can help overcome financial obstacles. Similar to emission pricing, linking soil health to financial indicators was indicated to support wealth redistribution (23). Cuts in farmers' profitability, accompanied by a lack of support and market confidence (17) can discourage other farmers from transitioning due to the initial costs involved. The coexistence of financial and market barriers creates a challenging dynamic.

The small market proved to be the biggest obstacle, especially regarding a nationwide transition. SEs extra costs lead to higher prices, making products uncompetitive in current capital markets and resulting in low demand from individuals and processors (17). The lack of hard institutions, such as regulations to manage demand from processors or promotional campaigns to raise awareness, hinders market adoption (17), acknowledging that the success of policies is never premised (56). Furthermore, declining demand from foreign markets poses an additional challenge. The withdrawal of flax cultivation or policies prioritizing export demonstrates that farmers adapt to meet the demands placed upon them. Demand determines supply in this free market, without protection for sustainable 'niches' in place (17).

### **Degrowth Principles**

The analyzed SEs not only adopted sustainable practices. Activities in line with degrowth principles were noted and increased significantly among entrepreneurs who had already converted. A categorization based on farming principles however is not possible, as both organic farmers engage in convivial community developments or promotion of biodiversity as do regeneratively oriented ones.

Converted/converting farmers prioritize environmental and community health over profit maximization based on their personal beliefs and definition of success (25,62). An outstanding consideration is the advanced level of converted SEs in embracing degrowth-oriented principles and their active engagement in relocalizing and promoting sustainable values at various levels beyond their social networks (25,62). Collaboration on biodiversity, demonstrating the compatibility of sustainable agriculture and food availability and actively advocating proposals

for support at public institutions are some examples. On a community level, collaboration with local and small-scale institutions as well as educational efforts with individuals is practiced, to reconnect and localize activities (32,37,56).

This commitment can be attributed to their social convictions as well as to the limited market demand for sustainable products in the Netherlands (17), while the demand from abroad declines. As the current market is small and farmers incur additional costs in favor of nature, their products are not competitive within the existing capitalist market. Consequently, a different business model, particularly in regenerative, becomes necessary. Direct, local distribution and short chains are practiced approaches to sustainable entrepreneurship that reduce emissions and create a connection between producer and consumer (37). Thus, they improve the current global food supply characterized by anonymity and long distances (14). The SEs' activism aims to create market demand and transform contextual structures by encouraging the adoption of sustainable behaviors among consumers, fellow farmers, and other stakeholders. These efforts align even with the characteristics of institutional entrepreneurs who shape and transform surrounding structures to achieve their strategic objectives (66). Additionally, local chains provide transparency and trust, allowing customers to witness firsthand how the products are grown and reducing the need for extensive certifications.

Overall, the SEs connected fundamental aspects of the degrowth movement to agriculture, such as community aspects, reconnecting with food and place, and promoting local, plant-based consumption patterns, to reduce the overall metabolism of agriculture (13,30).

## **Sustainable Life**

Lastly, further data provides specific insights into the farmers' practices to answer the question of their contributions to soil, personal, and business health.

As in alignment with Giller et al.'s (48) considerations about the framing of regenerative agriculture, the farmers emphasize a varied perspective on it, with some actively following regenerative principles while others focus on approaches, such as organic or agroecological methods benefiting soil health (19). All farmers have already taken steps to improve soil health, such as reducing tillage, cover-crops and minimizing pesticide usage. Strip cultivation and crop rotation, including different plant-families such as flax, are further steps taken by the more sustainable ones (48). Except for the conventional entrepreneur, all report improved soil quality. For him, the assessment period of three years is too short. Quantifiable data on reduced fertilizer use are not known.

The personal indicators the SEs mentioned include independent decision-making, alignment with personal values, finding fulfillment in working with nature despite challenges, and dietary changes (23,30). The conventional entrepreneur experienced the trade-off between growth and well-being, which lowered his growth targets.

Although profit is decoupled from success for most SEs (25), lacking knowledge about improving soil health is not the problem. The transitions can be financially demanding and even when transitioned, often only changes in distribution and business model can offset the

additional costs entrepreneurs incur to benefit the environment (64). Flax specifically contributes to business health when there is sufficient demand and value is successfully added.

### **Limitations**

As with any research also this study offers limitations. Although all participants were relevant to obtaining the necessary information, this was significantly limited by the selection of the SEs studied, which further constituted a minority in the Dutch agricultural landscape. The mid-late April period during which the interviews were to be conducted proved to be one of the most stressful for farmers, especially due to the rainy and cold April. As a result of this accompanied by little time flexibility, the sample was not balanced between non-transitioned and transitioned farmers, nor between arable or dairy farmers. Likewise, the language barrier presented a limitation as it restricted the choice of potential survey partners. Additionally, one participant preferred to respond via email, providing information to key questions but constraining the ability to ask follow-up questions or seek further details. Also, no one spoke their native language during the interviews. Retrospectively, the questions around degrowth principles proved insightful and unexpectedly progressive but were less suitable for the two who had not yet converted.

## CONCLUSION

This study aimed to enrich the academic and practical degrowth discourse in the agricultural sector to show how farmers as sustainable entrepreneurs can combat climate change. Applying exploratory qualitative research helped to answer the research questions. This transdisciplinary research with House of Design provided valuable insights into the adoption and retention of sustainable farming practices, as well as the development of relocalizing value chains and markets. It emphasized the complexities of generating demand for local products across the entire value chain, highlighting the importance of local consumption and the challenges of shaping a local, degrowth-inspired market.

Personal readiness for change is paramount, but it is also necessary to consider five different capitals that can either enable or hinder the process: Social, Human, Natural, Financial, and Market Capital. Furthermore, through establishing short chains as well as embodying and promoting degrowth-inspired values and challenging socio-technical regimes, the SEs reduce emissions, influence underlying institutions, and foster trust and a frugal lifestyle, thus, they are instrumental in mitigating climate change. In addition, sustainable practices contribute to soil and human health, although commercialization remains difficult and resource-intensive. To compensate for the additional costs in favor of nature, support or other business models are required.

In academia, this opens a fruitful avenue for further research to develop supporting concepts/business models to help farmers become more competitive in the current market. To adapt societal behavior, developing educational and awareness-raising approaches to promote

healthy, sustainable diets informed by trust and community-building principles is an interesting avenue, also for urban spaces. Analyzing the impact of such applied concepts on consumer behavior is one further idea, to establish consumption patterns in alignment with environmental health.

To become a sustainable country, financial support could encourage sustainable agricultural practices, at least in the transition phase, as it is a major consideration for entrepreneurs to remain financial while yields decline. Offering long-term land leases or reduced leases during the transition could be other instruments. Simultaneously, the need for a larger market to instill confidence poses challenges for many to convert. National measures for processors, public institutions, or advertisements can be taken, for example, to increase the necessary demand. Additionally, companies and municipalities can engage in community-supported or care-integrated agriculture, exchanging time for healthy food or developing time-compensation models. This creates an attractive environment while addressing climate challenges.

Especially with appropriate socio-economic infrastructure in place, sustainable agriculture entrepreneurship is instrumental in driving positive change toward a post-growth-inspired world, encompassing reduced emissions, a convivial lifestyle, enhanced biodiversity, and climate resilience.



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## APPENDIX A

Principle	Core Content	Corresponding Claims Found in Literature Related to Agrofood System Innovations
<b>Social Capital</b>	<i>community, family connections, formal/informal/local social networks, culture, values, shared narratives and language, trust, gender equality, habits</i>	<ul style="list-style-type: none"> <li>- To explain behavioral change and behaviors, social capital plays an important role (McNeil, 2018)</li> <li>- Linked to family connections, community and local social networks and relationships, that are important particularly to small-scale farmers, promoting common success in nature preservation and farming (Pinto-Correia, 2017)</li> <li>- Values, trust, relationships, cultures, shared narratives and languages (Villat, 2021)</li> <li>- Deeply held values and emotions influence and interact with mental models, worldviews, and cultural norms; and how behavioral change is sustained through positive feedbacks involving biophilic emotions, a sense of well-being, and an ever-expanding worldview. (Gosnell, 2019)</li> <li>- Cultural resistance to change, which depends on societal norms and values (Cannas, 2021)</li> <li>- Agricultural Advisory Services (AAS) constitute an integral part of farmer decision making related to soil management (Ingram, 2022)</li> <li>- System failures, soft institutions as social, cultural habits can hinder innovations' diffusion (Verburg, 2022)</li> <li>- Continuous change of governmental vision by the Ministry of Agriculture which leads to a lack of long-term vision. (Verburg, 2022)</li> </ul>
<b>Human Capital</b>	<i>experience, informal/formal education, knowledge, personal capabilities</i>	<ul style="list-style-type: none"> <li>- Human capital is closely linked to obtain and exploit information (Farace &amp; Mazzotta, 2015)</li> <li>- The ability to access and use existing and new knowledge promotes innovation (Farace &amp; Mazzotta, 2015)</li> <li>- Recognizing, capturing, and transforming capabilities in the agri-food sector through novel approaches - for example, a corporate identity aligned with territorial values and personal capabilities such as intuition, creativity, and empathy (Cannas, 2021)</li> <li>- Strengthening individual and collective capabilities to innovate (Klerkx, 2012)</li> </ul>
<b>Financial Capital</b>	<i>market price, investments, subsidies</i>	<ul style="list-style-type: none"> <li>- Includes savings, cash, credits, or other economic instruments (van den Berg, 2020)</li> <li>- The process is very lengthy and difficult which leads to high investments while only receiving conventional milk prices (Verburg, 2022)</li> <li>- Expensive transition phase (Verburg, 2022)</li> <li>- Lack of governmental support/subsidies (verburg, 2022)</li> <li>- Concerned over the impact this would have on profitability, concerns about profit. (Bakker, 2023)</li> <li>- Not always main driver/barrier; can subvert intrinsic drivers (Villat, 2021)</li> </ul>
<b>Market Capital</b>	<i>demand, price of products, advertisement/stimulation, (governmental) support in the sense of policies and market formation, competition</i>	<ul style="list-style-type: none"> <li>- Hard institutions relate to laws, regulations (Verburg, 2022)</li> <li>- The lack of consumer demand is possibly influenced by the high prices and low quality of the organic products. But also, by the missing stimulation of government to the retail sector through e.g. marketing campaigns (Verburg, 2022)</li> <li>- Too little demand processors (Verburg, 2022)</li> <li>- Competition foreign markets (Verburg, 2022)</li> <li>- Competition with foreign countries (Verburg, 2022)</li> </ul>
<b>Natural Capital</b>	<i>land/soil health, ecosystem service, feedback from nature (soil, biodiversity), ownership</i>	<ul style="list-style-type: none"> <li>- Natural capital can be defined as the stock and accumulation of ecological features, natural resources, ecosystem services, or a resource that relates to them. (Villat, 2021)</li> <li>- Includes soil and land, one of the most fundamental capitals for farmers in sustaining farm productivity (Azad, 2020)</li> <li>- Ownership may influence motivation adopting stewardship and to preserve soil health for future generations (Solly, 2021)</li> <li>- High land prices and limited accessibility to farmland (Verburg, 2022)</li> </ul>
<b>Degrowth Principles</b>		
Society/Environment		
<b>1) Alternative understanding of business; Repurpose the business for the environment and society</b>	<i>social mission, purpose for society, alternative understanding of success</i>	<ul style="list-style-type: none"> <li>- A first decisive claim about organizations approaching degrowth is the de-emphasis on profit maximization (Johanisova et al., 2013) in favor of a focus on benefits for the community and the environment (Hankammer, Kleer, Mühl, Euler, 2021)</li> <li>- driven by a social mission (Hankammer et al., 2021)</li> <li>- sufficiency oriented (Hankammer et al., 2021)</li> <li>- profit distribution among stakeholders (Hankammer et al., 2021)</li> <li>- remaining at certain size, not growing (cause with growing connection to community, customers gets lost (Hankammer et al., 2021)</li> <li>- solving environmental problem over profit (Khmara &amp; Kronenberg, 2020)</li> <li>- Qualitative growth (quality of work and life); preference for remaining at a certain size (Khmara &amp; Kronenberg, 2020)</li> </ul>
<b>2) Activism &amp; Promoting sustainable/degrowth thinking</b>	<i>education, raising awareness, coalition-building, pressure on established institutions</i>	<ul style="list-style-type: none"> <li>- Advertising plays a central role, but rather in the sense of education (Hankammer et al., 2021)</li> <li>- Campaigns should not only raise awareness of environmental issues but rather promote lifestyle movements that promote degrowth (Hankammer et al., 2021)</li> <li>- To promote the societal acceptance of degrowth, a stronger coalition-building between organizations and their stakeholders might be important (Hankammer et al., 2021)</li> <li>- Transporting positive image of a future beyond materialism (Hankammer et al., 2021)</li> <li>- The influence of various stakeholders helps to normalize new behavior; adopting new practices (Bocken, 2017)</li> <li>- "Strong consistent communication of corporate values both internally and externally (Bocken, 2016)</li> <li>- Open licence production (Khmara &amp; Kronenberg, 2020)</li> </ul>
Community		
<b>3) Collaborative value creation, locally embedded and community based</b>	<i>Relocalization, collaborative working, convivial manner</i>	<ul style="list-style-type: none"> <li>- Positioning the company as part of a broader community (Khmara &amp; Kronenberg, 2020)</li> <li>- Locally rooted (Hankammer et al., 2021)</li> <li>- Relocalization of activities, also at the product design level: includes involvement of local actors and skills as well as the local production (Hankammer et al., 2021)</li> <li>- Commons projects (Hankammer et al., 2021)</li> <li>- Conviviality of local communities/convivial society (Hankammer et al., 2021)</li> <li>- Collaboration with business partners and other stakeholders on solving social and environmental problems together (Khmara &amp; Kronenberg, 2020)</li> </ul>

## Synthesized analytical framework and corresponding claims

## APPENDIX B

Interviewees	Farming Type	Method	Note
Farmer 1	arable	half conventional - half ecological	studies various ecological processes
Farmer 2	arable	biodynamic / regenerative	integrated care farm, well embedded in local networks and active part in raising awareness
Farmer 3	arable	organic / 20% regenerative	changed business model, selling directly and locally to e.g. health institutions
Farmer 4	dairy	organic	actively engaging in bird preservation, organic since 2022
Farmer 5	arable	conventional	still more focused on exports / high yields
Farmer 6	arable	organic	organic since 1990, greenhouse without lighting/heating, always accessible greenhouse for everyone

Sample description

## APPENDIX C

Second Order themes	Conceptual Codes
<b>Drivers / Barriers</b>	Social Capital
	Human Capital
	Natural Capital
	Financial Capital
	Market Capital
<b>Degrowth Principles</b>	Repurpose the business for the environment and society
	Activism & Promoting sustainable/degrowth thinking
	Relocalizing, Locally embedded and community based
<b>Sustainable Life</b>	Regenerative Agriculture
	From conventional practices to sustainable alternatives
	Flax
	Soil Health
	Personal Health
	Business Health

Appendix C1: Only higher ranking codes. Coding tree including descriptive codes and quotes, see below.



**APPENDIX D**

Drivers and barriers of the transition to sustainable agriculture

## APPENDIX E

## INFORMED CONSENT FORM



**Title of study:** What hinders/enables farmers adopting more sustainable farming principles in the context of the Northern Netherlands - from a degrowth perspective.

**Name of participant:**

**Assessment**

- I have read the information sheet and was able to ask any additional question to the researcher.
- I understand I may ask questions about the study at any time.
- I understand I have the right to withdraw from the study at any time without giving a reason.
- I understand that at any time I can refuse to answer any question without any consequences.
- I understand that I will not benefit directly from participating in this research.

**Confidentiality and Data Use**

- I understand that none of my individual information will be disclosed to anyone outside the study team and my name will not be published.
- I understand that the interview will be recorded but not shown to any third parties.
- I understand that the information provided will be used only for this research and publications directly related to this research project.
- I understand that data (consent forms, recordings, interview transcripts) will be retained on the Y-drive of the University of Groningen server for 5 years, in correspondence with the university GDPR legislation.

**Having read and understood all the above, I agree to participate in the research**

**study: yes / no**

**Date**

**Signature**

---

To be filled in by the researcher

- I declare that I have thoroughly informed the research participant about the research study and answered any remaining questions to the best of my knowledge.
- I agree that this person participates in the research study.

**Date**

**Signature**

A handwritten signature in black ink, consisting of a stylized, cursive script.

Click here to the [shared folder](#)

## APPENDIX F

### Interview Guide:

#### Information:

- Who am I?
- Appreciation of being able to do this
- Why do I do this
- Administrative things: consent form and ask for permission that I can record.

#### Icebreaker question:

- How did your day look like so far?

#### Starting question/Timeline question:

- Can you give me a brief history of your farm? (long family tradition, changes etc. and highlight some changes)
- What farming 'method' do you currently follow – to improve the soil health? ( to describe them better)

#### Main questions:

##### Transition/Repurpose – Drivers/barriers:

- What was your motivation to transition?
- When you adopted more sustainable practices of any kind:
  - what helped you?
  - what turned out to be difficult / more difficult than expected?
  - *What difficulties did you have finding new techniques, fundings, clients, whatever?*
  - *How easy/difficult deciding? Role of financials?*
- What according to you is needed to accelerate a broad transition towards more sustainable practices in the Netherlands?

##### Transition/Repurpose – Personal:

- Can you share your own experience of such a transition? How did that transform you?
- What has changed for you since you've transitioned? Health, healthier business, well-being, resilience, nature, financial....)



- What were your expectations what this transition would bring? (nature / personal / business)
- Did they fulfill?
- How do you measure success?/ What's success for you?

**Promoting social acceptance of sustainable practices:**

- How do you share your values/way of transitioning with others? (Do you have farmers/friends that do/dont do regenerative farming? → talking to other farmers, engaging in campaigns, pressure on institutions,..) catalyst of share good ideas
- What reactions do you perceive?
- What support do you experience from your community?

**Collaborative value creation:**

- Why did you decide cooperate together with House of Design, or generally, what are the reasons for working in a cooperative/collaborative network? What was it that made you to join the Wad van Waarde project?
- E.g. hemp/flax enough knowledge? Who helps finding knowledge, learnings, etc.?
- What has changed in adopting such a collaborative way of working? What benefits do you perceive of working collaboratively? What is challenging?
  - *Have you been working in such a collaborative way before?*
  - *How does working in collaboration look like?*

Sustainable farming principles: regenerative, hemp/flax, but also others ...

**Flax/hemp:**

- **Those growing hemp/flax:**
  - Why did you adopt flax/hemp? How did you get to know this? How was the 'adoption' process?
  - How does it add to the health of your soil - quality of other crops and your business?
  - Are you 'intentionally' producing for the region mainly?
  - How do you see the future of hemp/flax? Any other ideas of how to grow it? (besides food / feed)
  - What would you need to scale-up?
- **Those NOT growing hemp/flax or any other sust. practices:**
  - What factors speak against this for you?

- What do you think would growing hemp/flax add to the health of your soil?
- **All:** Do you think adopting more sustainable farming principles can be a future for farmers?

**Regenerative farming:**

- **All:** What does regenerative farming mean to you and what steps do you already take in this approach? (and what are your reasons for not following regenerative practices, if you don't, that of course may be valid reasons like risks financially, naturally, etc.)
  - How do you think regenerative farming adds to (your) business model?
- **Those growing flax/hemp:** What do you think does growing flax/hemp add to regenerative farming and business model?

**Outro**

- What are your plans / challenges for the future?