Dutch initiatives working on regenerative agriculture and their international ambitions

An overview of current efforts regarding regenerative agriculture in the Netherlands

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Summary

The global food system significantly contributes to greenhouse gas emissions, terrestrial acidification, and eutrophication, which adversely impact global food security. Agriculture, at the heart of this system, is a major source of environmental pollution through the use of pesticides, fertilizers, and other chemicals. Regenerative agriculture has emerged as a response to these challenges, emphasizing soil conservation and ecosystem services for sustainable food production. The Netherlands has been a key player in promoting regenerative agriculture, leveraging its innovative agricultural history. However, the extent of its adoption by Dutch stakeholders remains unclear. This study investigates the network of actors involved in regenerative agriculture in the Netherlands, aiming to provide a comprehensive understanding of current initiatives and their (inter)national ambitions.

Regenerative agriculture, although lacking a formalized definition, focuses on restoring ecological functions beyond mere sustainability. It involves practices like prioritizing soil health, reintegrating livestock, minimizing tillage, and enhancing carbon sequestration. Despite varying interpretations, the core principles remain centered on soil health and ecosystem services, supporting environmental, social, and economic sustainability. However, these principles are not universally applicable across all farming systems and contexts, requiring tailored approaches. To showcase these tailored approaches this study mapped Dutch regenerative initiatives. By reviewing stakeholder websites using advanced search options in Google and LinkedIn. The initial search yielded over 800 initiatives, narrowed down to 199 after removing duplicates and non-relevant items. These initiatives were analyzed based on location, type, size, orientation, themes, and practices. The majority of initiatives were located in Amsterdam, Rotterdam, and Wageningen, with farmers (e.g. Krulstaartje, Bodemzicht), processing companies (e.g. McCain, Cargill), and advisory enterprises (e.g. KAIROS, Met Natuur Mee) being the primary types. These initiatives predominantly focused on environmental themes like soil health and biodiversity, with varied practices such as using cover crops and crop diversity.

Interviews with nine selected initiatives revealed their involvement in international knowledge sharing and local network building. Many initiatives collaborated internationally, especially in Europe and North America, and showed interest in emerging markets in Africa, Asia, and South America. However, significant barriers to international collaboration included financial challenges, finding reliable local partners, and bureaucratic hurdles. Initiatives requested government support in obtaining grants, subsidies, and improved financial incentivization schemes. They also emphasized the need for government-facilitated connections between food system actors and proactive engagement.

The Netherlands has made significant progress in promoting and adapting to regenerative agriculture, but challenges remain for international expansion. Addressing financial, regulatory, and logistical barriers, along with enhanced governmental support, is crucial for maximizing the potential of regenerative agriculture both nationally and globally. This study underscores the importance of tailored approaches and proactive government involvement to support the diverse and growing network of regenerative initiatives.

Highlighted research, report, and projects

	Definitions of regenerative agriculture	Reference	Type
1	Regenerative agriculture – the soil is the base	Schreefel et al. (2020)	Scientific
2	What Is Regenerative Agriculture? A Review of ...	Newton et al. (2020)	Scientific
3	Regenerative Agriculture: An agronomic perspe…	Giller et al. (2021)	Scientific
4	Moving towards an anti-colonial definition for ...	Sands et al. (2023)	Scientific
5	What is regenerative agriculture?	Cusworth G et al. (2023)	Report

	Business models for regenerative agriculture	Reference	Type
1	Kosten en baten van transitie in de …	WIJland (2021)	Report
2	Financing regenerative agriculture	Bosma et al. (2020)	Report
3	Regenerative Business Models	Renature (2023)	Website
4	EIT Food's Regenerative Innovation Portfolio	EIT Food (2024)	Website
5	Advancing Regenerative Agriculture in the EU …	AgriCaptureCO2 (2023)	Report

	Other reports regarding regenerative agriculture	Reference	Type
1	Ervaringen en lessen uit een Community of …	Smit et al. (2023)	Report
2	Regeneratieve Landbouw" - Leer over de ...	Näser (2023)	Dutch book
3	The Four Labours of Regenerative Agriculture	Fairr (2023)	Report
4	Ground Zero? Let's Get Real on Regeneration!	Giller et al. (2023)	Report
5	Regenerative agriculture in Europe	EASAC (2022)	Report

	Dutch projects regarding regenerative agriculture	Orientation	Type
1	TIFN'S Regenerative Farming Project	National	Dutch project
2	RE-GE-NL	National	Dutch project
3	100 hectare regeneratieve landbouw	National	Dutch project
4	EARA	Europe	Movement
5	We Are The Regeneration	Europe	Movement

1. Introduction

The global food system is a major driver to anthropogenic greenhouse gas emissions, terrestrial acidification, and eutrophication of surface waters (Crippa et al., 2021). These environmental impacts have far-reaching consequences for global food security, including land degradation, which affects approximately one-third of the world's land due to erosion, salinization, compaction, acidification, and chemical pollution (FAO and ITPS, 2015; United Nations, 2022). Agriculture, as the cornerstone of the global food system, is responsible for a substantial portion of environmental pollution through the use of for example pesticides, fertilizers, and toxic farm chemicals. In response to these pressing challenges, regenerative agriculture has surged to the forefront of political discourse, emphasizing soil conservation and fostering a range of ecosystem services to promote sustainable food production from both environmental and socio-economic perspectives (Schreefel, 2023). While regenerative agriculture garners widespread endorsement, the Netherlands has increasingly engaged in its advancement (e.g. Re-Ge-NL). With its rich history in innovative agricultural techniques, the Netherlands stands poised to provide an exemplary model for the integration of regenerative agricultural methodologies on a global scale. However, the precise degree to which regenerative agriculture has been embraced by key stakeholders within the food system in the Netherlands remains unclear.

This study investigates the dynamic network of actors encompassing for example businesses, research institutions, governmental bodies, and non-governmental organizations actively participating in the realm of regenerative agriculture within the Dutch context. Through a thorough examination of the literature and interviewing of initiatives dedicated to advancing regenerative agriculture, our objective is to offer a comprehensive understanding of the current landscape of regenerative agriculture initiatives in the Netherlands and specifically for RVO there (inter)national ambitions. By delineating this landscape, we aim to illuminate the specific objectives pursued by regenerative initiatives, the actions they promote, and discern optimal strategies for governmental support of these initiatives, both at the national and international levels. In view of a fruitful collaboration between RVO and Wageningen University & Research we aim to contribute valuable insights and knowledge to the primary objectives, illustrated in Figure 1.

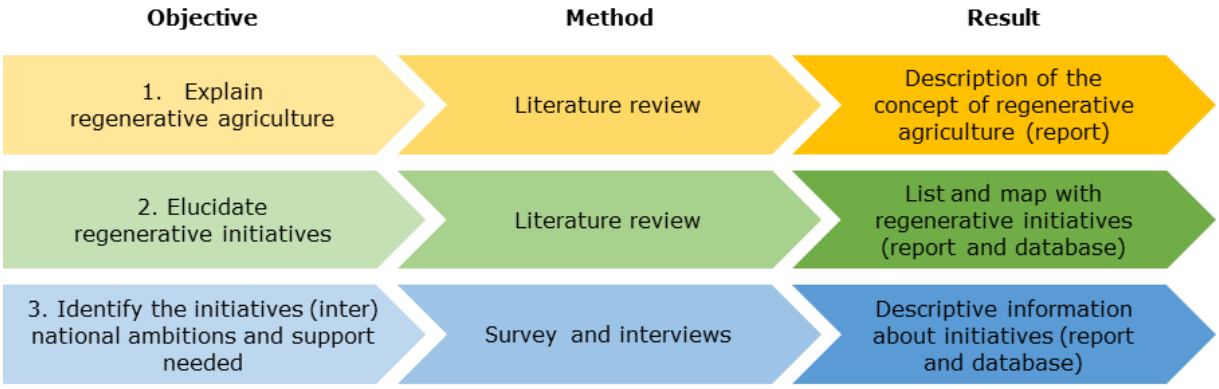

Figure 1. *Conceptual illustration to assess the current state of regenerative agriculture in the Netherlands.*

2. What is regenerative agriculture?

"Regenerative agriculture" has become a prevalent term in discussions surrounding the transformation of food systems (Giller et al., 2021; Schreefel et al., 2020). Yet, its definition remains fluid, lacking a formalized definition. Consequently, among its proponents, there exists a spectrum of perspectives regarding its essence. However, there's a consensus that it extends beyond mere sustainability to the restoration or regeneration of natural ecological functions (Cusworth & Garnett, 2023). Given its relatively recent emergence, regenerative agriculture hasn't solidified into a clearly defined or certified approach to farming. Consequently, interpretations vary (Figure 2). For some, it primarily entails farming practices that prioritize soil health, reintegrating livestock, minimizing tillage, and enhancing the carbon sequestration potential of soils. Others perceive it as a paradigm shift in humanity's relationship with nature and consumer-producer dynamics. Their aim is to bridge the gap between human and natural systems, striving for mutual symbiosis. The debate also encompasses whether regenerative agriculture emphasizes outcomes or specific practices (Newton et al., 2020).

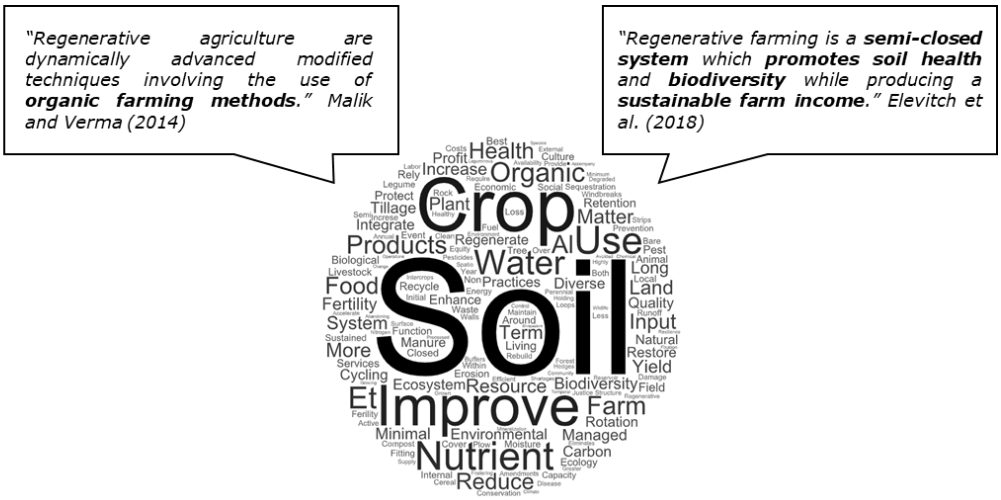

Figure 2. *A word cloud illustrating the different perceptions on regenerative agriculture based on the literature of Schreefel et al. (2020), with specific examples of Malik and Verma* (2014) *and Elevitch et al.* (2018)*.*

Despite circulating since the 1980s, the past decade has witnessed a surge in interest and adoption (Figure 3). This diverse understanding reflects the varied stakeholders now involved, from farmers and agronomists to multinational corporations, politicians, and marketers. While some embrace this broad engagement, others fear corporate co-option, potentially diluting its core principles. The influx of corporate entities has introduced new dynamics, emphasizing measurement, accreditation, and marketing, shifting focus away from its grassroots origins centred on regenerating soils and other ecosystem services. While some view this inclusivity positively, others perceive it as a threat to the integrity of regenerative agriculture.

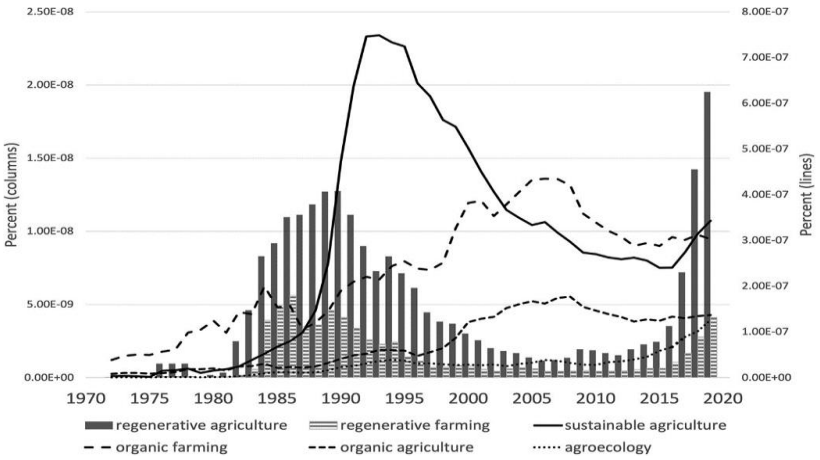

Figure 3. *The frequency of key terms in books (3-year rolling averages) which includes books predominantly in the English language published in any country* (Giller et al., 2021)*.*

In order to deepen the understanding about the meaning of regenerative agriculture various scholars undertook comprehensive reviews to delineate levels of convergence and divergence between definitions (Newton et al., 2020; Schreefel et al., 2020). These reviews included over 250 scientific studies and showed that soil conservation is the entry point of regenerative agriculture to improve various ecosystem services. This approach aims to enhance not just the environmental, but also the social and economic aspects of sustainable food production (Figure 4). It's no surprise that regenerative agriculture primarily involves practices aimed at revitalizing or preserving soil health, benefiting not only food production but also other ecosystem services. However, it's noted in these reviews that these regenerative objectives and practices aren't universally applicable across all farming systems and local contexts (Schreefel et al., 2022). For instance, dairy farmers operating on peat soils encounter distinct challenges compared to arable farmers on clay soil. Consequently, they must prioritize different objectives and implement tailored practices accordingly. Although, regenerative agriculture is context-specific in this report we use the overarching definition of Schreefel et al., (2020), which define regenerative agriculture as an approach to farming that uses soil conservation as the entry-point to regenerate a wide range of ecosystem services that relate to 'biodiversity and habitat provision, water regulation and purification, nutrient cycling, climate regulation, human and animal wellbeing, and economic prosperity'.

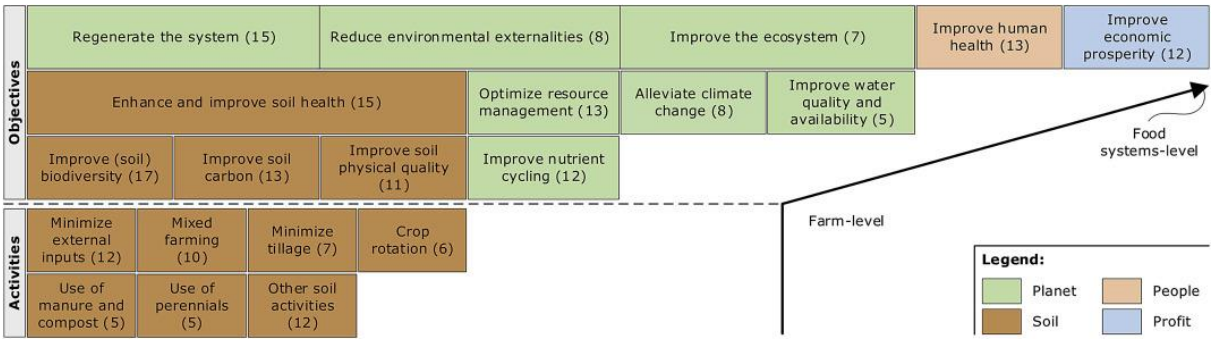

Figure 4. *The core themes of regenerative agriculture, in which 'the number between brackets' represents the number of science-driven definitions referring to each theme* (Schreefel et al., 2020).

3. Elucidate regenerative initiatives in the Netherlands

To elucidate Dutch initiatives dedicated to regenerative agriculture, this study reviewed stakeholder websites using advanced search options on Google and LinkedIn. Keywords for creating a search string included "regenerative agriculture" or "farming" in both English and Dutch. The criteria for including initiatives required the presence of a website describing how the initiative contributes to or engages with regenerative agriculture. Supplementary materials S1 provide more information about the specific search query used and the exclusion criteria applied. The initial search yielded over 800 initiatives (Table 1). After removing 588 duplicates and non-relevant items, such as newspaper articles and blog posts, we excluded an additional 18 initiatives based on full-text screening, resulting in 199 initiatives for further analysis. These initiatives were analysed based on several descriptive factors: 1) location, 2) year of commitment to regenerative agriculture, 3) type of initiative (e.g., farmers, industry, knowledge institutes), 4) size (e.g., small or large), 5) national or international orientation, 6) regenerative themes fostered, and 8) regenerative practices implemented. The type of information scraped from the initiatives' websites will contribute to understanding the quantity and diversity of actors involved in regenerative agriculture. For categorizing and assessing the size of the initiatives, we used sector specific criteria from CBS and Agrimatie, detailed in supplementary materials S2. For addressing the regenerative themes, we have aggregated website information to predefined themes based on the core themes of regenerative agriculture identified by Schreefel et al. 2020. This study specifically focuses on initiatives using the term "regenerative". However, we acknowledge that other sustainable farming approaches share similar objectives and practices with regenerative agriculture. Therefore, the results of this scoping review likely represent just a subset of a larger array of initiatives using different terminology (e.g., nature-inclusive, climate-smart, agroecological, circular) that contribute to more resilient farming and food systems. The complete list of initiatives found from our literature review can be found in supplementary materials S3.

Table 1. *Shows the initial number search results before and after using exclusion criteria.*

		No. of initiatives
Initial search		**805**
	Google Advanced search	190
	LinkedIn Advanced search	615
Excluded based on:		**588**
	Not relevant (e.g. newspaper item)	141
	Duplicate	447
Records for full text-screening		**217**
Records excluded after full text-screening:		**18**
	Not accessible	5
	Not relevant (e.g. not related to agriculture)	13
Final number of records		**199**

4.1 Location and year of commitment of regenerative initiatives

Of the 199 initiatives identified in the Netherlands, the majority were located in the capital city of Amsterdam (42 initiatives). Other significant hubs included Rotterdam (13 initiatives) and Wageningen (10 initiatives). The initiatives in these cities were primarily headquarters of processing companies (e.g. Unilever and Cargill), financial institutions (e.g. Van Lanschot Kempen and ABN AMRO), and NGOs (e.g. Rainforest Alliance and Global Landscape Forum). Apart from these hotspots, other initiatives were distributed throughout the Netherlands, representing a wide array of initiative types, from farm advisory services to supply companies. Farmers engaged in regenerative agriculture were also found across the country, highlighting the broad adoption of regenerative agriculture across different contexts (e.g., soil types) and farming systems (e.g., arable and livestock). The number of committed initiatives has been increasing, with early adopters showing their commitment between 2005 and 2015, and an almost exponential growth since 2016 from a diverse range of food system actors. Similar trends have been observed in academia, with exponential increases in both popular news items (Giller et al., 2021) and peer-reviewed articles (Schreefel, 2023).

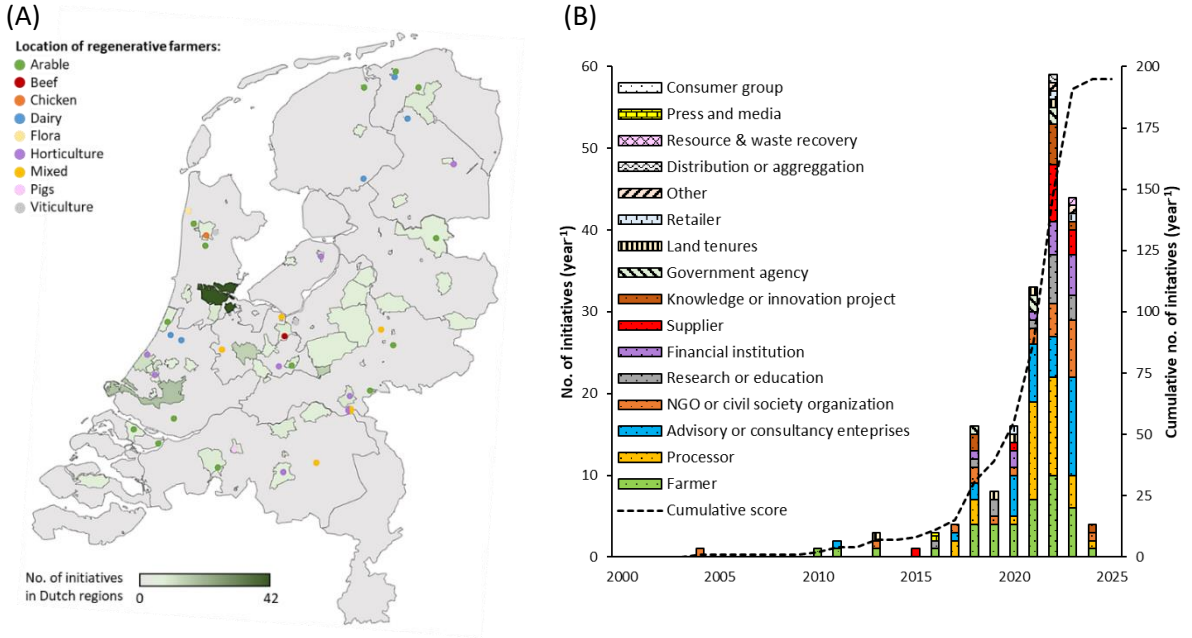

Figure 5. *Overview of regenerative initiatives in the Netherlands (A), in which initiatives are shown on the map at the municipality level. Regenerative farmers are shown as dots on the map where colours represent different farm archetypes. The year of commitment to regenerative agriculture (B) shows the absolute number of initiatives per year as stacked bars and a dotted line that shows the cumulative number of initiatives over time.*

4.2 Type and size of regenerative initiatives

From the 199 initiatives examined, 16 categories of initiative types were identified, spanning from farmers to the top of the supply chain (Figure 6). The majority of initiatives were composed of farmers (20%), processing companies (18%), and advisory enterprises (17%). These three types will be discussed in further detail. Despite a wide variety of initiatives within the 16 categories, the sizes of actors also varied. For instance, within the farmer category, nine different farm typologies were found, predominantly arable farmers (14), horticulturists (8), and dairy farmers (5), but also including for example a bulb (i.e. Huiberts Biologische Bloembollen) and a pig farm (i.e. Krulstaartje). Farm sizes varied significantly, with most being small-scale (e.g., arable farms of <10 ha, dairy farms with <50 cows, orchards <1 ha), and only a few were large or very large farms (e.g., >300 ha). These farmers were mostly nationally oriented, not primarily producing for an international market, though they occasionally shared knowledge internationally. Similarly, a wide diversity of processing companies engaged in regenerative agriculture, including those involved in livestock feed (e.g. Cargill, De Eendracht U.A.), pet food (e.g. Purina), textiles (e.g. Hugo Boss, Patagonia), ketchup (i.e. Kraft Heinz Company), whisky (i.e. Diageo), and coffee (e.g. Nescafe, Wakuli). In contrast to farmers, these companies were generally very large, often multinational, with over 100,000 employees. These companies frequently had headquarters either in the Netherlands or abroad and primarily focused on product trade. Supplementary materials S4 provide additional details regarding the international orientation of initiatives. Regarding advisory or consultancy enterprises, predominantly (8 out of 11) small to medium-scale enterprises were committed to regenerative agriculture (e.g. ReNature and HarvestCare), though initiatives of all scales were found (e.g. Springtail and Peterson). These advisories spanned diverse sectors (e.g. healthy food, cannabis), offering advice on regenerative practices at the farm level or throughout the supply chain (e.g. Peterson), monitoring environmental impacts (e.g. DéWarrier), and designing multifunctional landscapes globally (e.g. AidEnvironment). These initiatives were interested in both national and international knowledge sharing and collaborative projects. Notably, in this study we also included 'knowledge and innovation projects' dedicated to the pursuit of regenerative agriculture. In such projects (e.g. 100 hectare Regeneratieve Landbouw) individual initiatives do not show a direct commitment to regenerative agriculture but do invest in the transition towards regenerative agriculture (e.g. Invest-NL, Agrifirm, Rabobank, FrieslandCampina). These projects ranged from local projects with a strong focus on farmers such as Regeneratieve Landbouw Veenkloniën (RLV) to national large-scale public – private partnerships between a wide range of food system actors such Re-Ge-NL. Although these projects highlight collaboration between initiatives, semi-structured interviews with farmers and private sector companies reveal that still many initiatives feel like they are pioneering the path towards regeneration on their own.

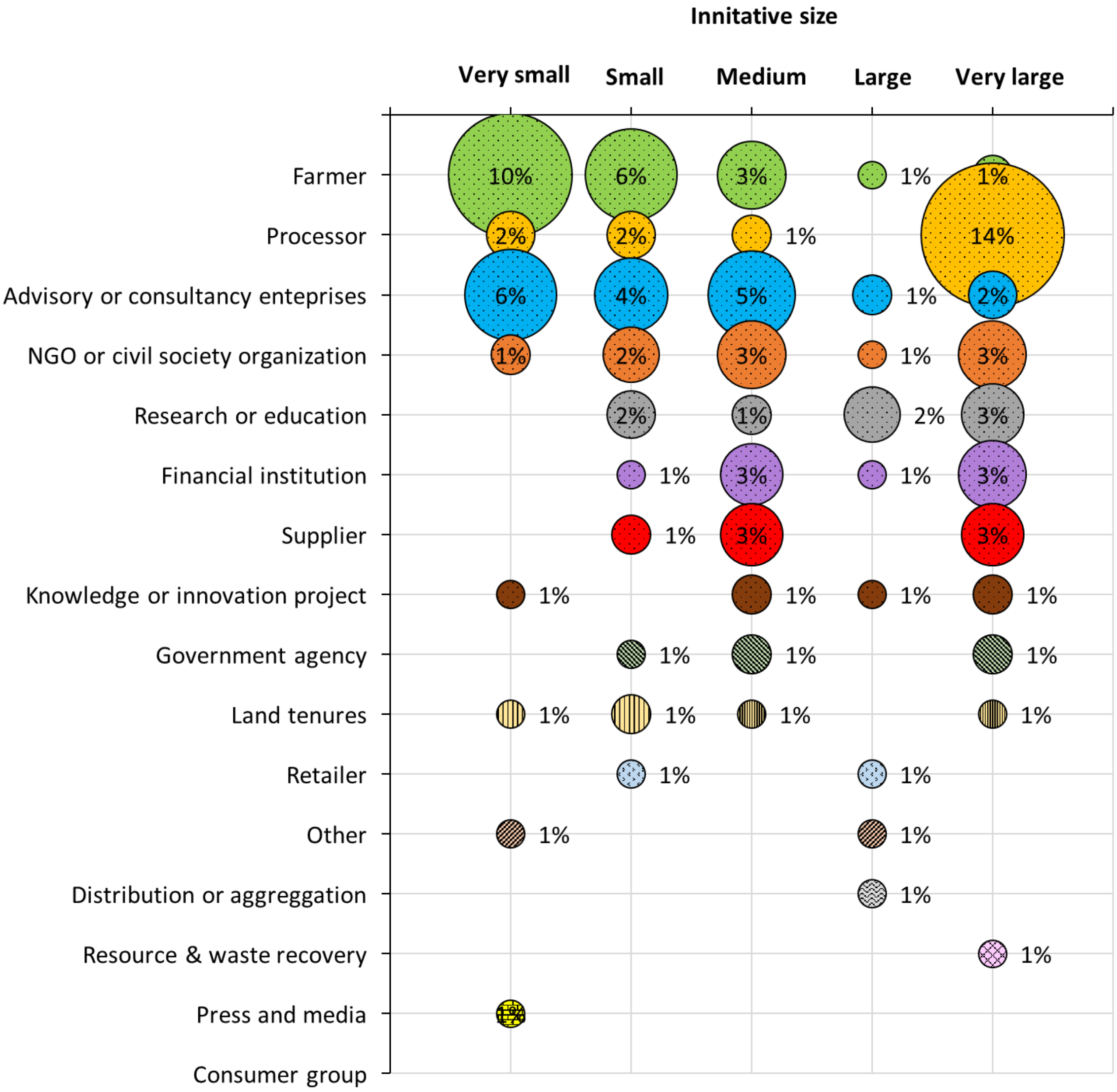

Figure 6. *Showing the various initiative types in 16 categories and their size ranging from very small to very large. Details on the criteria used to determine sizes per sector see supplementary materials S2.*

4.3 Commitment to regenerative themes and practices

To clarify how different food system actors perceive regenerative agriculture, we analysed the regenerative themes and practices mentioned by 199 initiatives on their websites (Figures 7 and 8). Figure 7 illustrates that various initiatives, including those by farmers and processors, generally aim to contribute equally to several themes, with a predominant focus on environmental issues (planet) and less emphasis on socio-economic themes (people and profit). Notably, animal welfare receives less attention, likely because many arable farmers and horticulturists do not integrate livestock, rendering this theme irrelevant for them. The initiatives predominantly engage with soil health (81%) and biodiversity (78%). Additionally, many initiatives aim to address multiple themes: 8% of the initiatives contribute to all eight themes, and over 20% address seven themes (see supplementary materials S4). Despite this, 11% of initiatives using the term "regenerative agriculture" do not specify how they contribute to this approach, omitting mention of any particular theme.

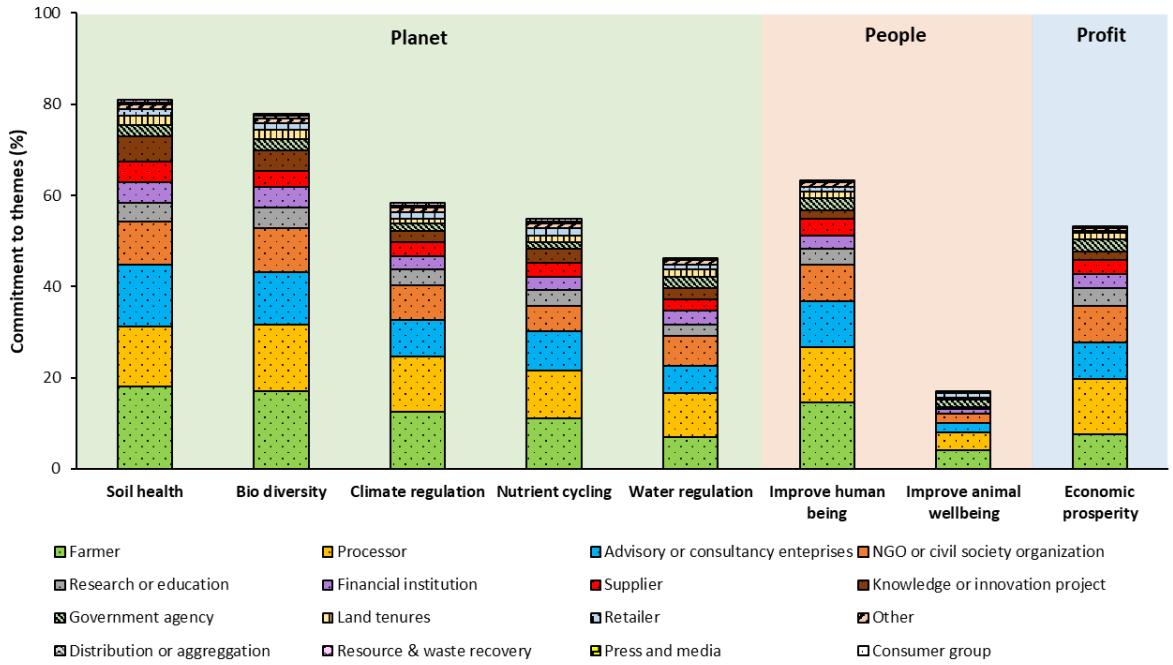

Figure 7. *Commitment of initiatives to various regenerative themes and dimensions of sustainability (people, planet, profit) as percentage of total number initiatives.*

In addition to engaging with various regenerative themes, initiatives also promoted specific regenerative practices. In figure 8, we show these practices that were mentioned more than two times. In total we identified nearly 100 distinct practices that were mentioned to varying degrees and contributed to different sustainability dimensions. Figure 8, reveals that most practices were promoted for their contributions to environmental sustainability. Cover crops and green manures were the most frequently mentioned practices, followed by crop diversity, and then the (non) use of pesticides, tillage, and artificial fertilizers. However, the frequency with which practices are mentioned does not necessarily indicate their popularity, as the data is influenced by the number of regenerative initiatives within each sector. For instance, cover crops are mainly promoted by arable farmers, while regenerative dairy farmers, who rely on permanent grassland, do not typically use cover crops. Since our study included a higher number of arable farmers compared to dairy farmers, the frequency of agronomic practices appeared to be high. Figure 8 also differentiates between practices that aim for complete elimination and those that seek reduction (see supplementary S5). This distinction is particularly relevant for practices such as no or reduced tillage, pesticide use, and artificial fertilizer use. Among the primary types of initiatives (i.e., farmers, processors, advisors), most farmers clearly support the complete elimination of tillage, pesticide use, and artificial fertilizers. In contrast, while processing companies aim to achieve the same regenerative goals as farmers, they more often advocate for minimizing or reducing these practices. This often leads to debates about the ambiguity of the term "reduce", raising concerns about when and how processing companies intend to phase out harmful practices, which can result in accusations of greenwashing. However, processing companies face the challenge of working with many diverse farmers at different stages of transitioning to regenerative agriculture, and not all can fully eliminate such practices. For instance, no-tillage might be viable for some dairy farmers on sandy soil, whereas arable farmers on compacted heavy clay soils may benefit from some form of minimal tillage (e.g., reduced frequency, depth, or specific types of tillage under appropriate weather conditions) to improve soil multifunctionality especially in the transition process to regenerative agriculture (Derpsch et al., 2014; Pearsons et al., 2023). It is important to note that Figure 8 only includes practices mentioned at least twice. Therefore, the category ‘other’ represents practices mentioned only once, which does not imply they are unimportant but rather specific to certain contexts or farming systems. For example, practices related to pig farming, such as 'no tail cutting' or 'reduction in artificial light use,' did not appear in Figure 8 because only one pig farm committed to regenerative agriculture. Supplementary S6 provides an overview of practices mentioned only once.

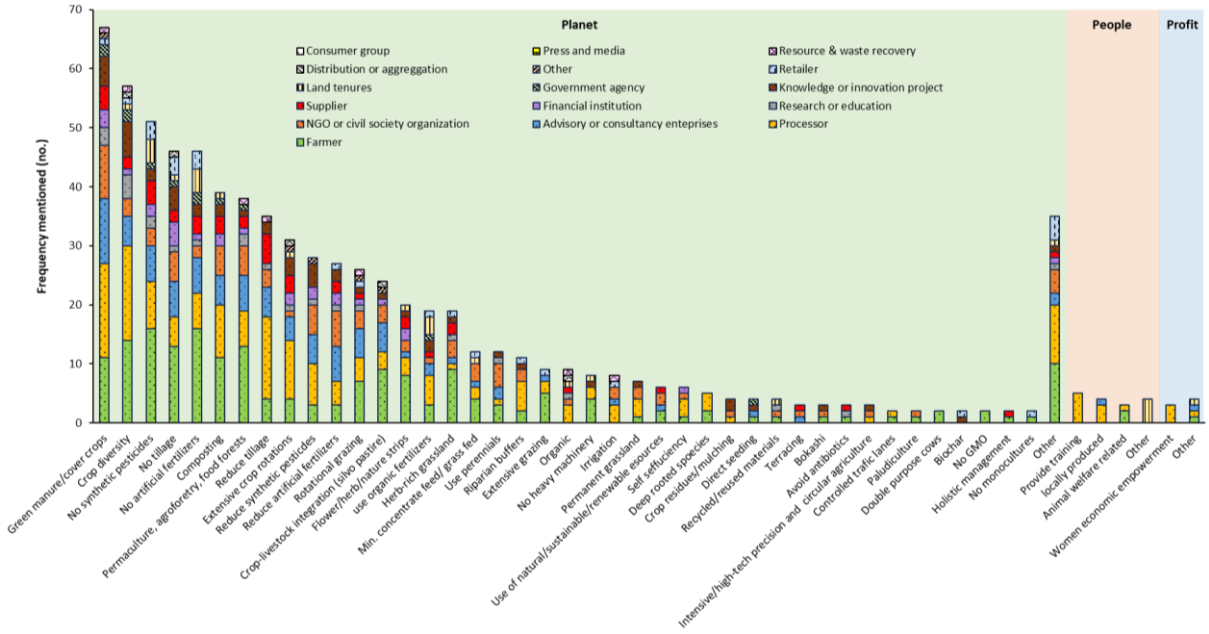

Figure 8. *Commitment of initiatives to various regenerative practices that were mentioned more than two times.*

4. Government support for regenerative initiatives and their international ambitions

Regenerative agriculture has demonstrated positive effects on the environmental and socio-economic aspects of various farming systems (LaCanne & Lundgren, 2018). Although the reported impacts may be largely context-specific, large research initiatives are emerging that assess the impact of regenerative agriculture on a larger scale. These initiatives investigate how regenerative agriculture can combat global challenges such as mitigating climate change, regenerating soils, improving biodiversity, reducing water scarcity, coping with productivity losses, and promoting more responsible resource use. A notable initiative is Project DRAWDOWN, which estimated that 15 to 23 gigatons of CO_2 could be removed from the atmosphere by 2050 if regenerative agriculture is implemented globally. Key to such analyses is the recognition that single regenerative practices may not be sufficient; instead, a combination of multiple "solution wedges" is necessary to address these global challenges effectively. The feasibility of the wider adoption of regenerative agriculture depends largely on overcoming socio-economic and political barriers. These barriers are beginning to fall as governments, agricultural companies, financial institutions, consumers, and farmers recognize the great potential of regenerative agriculture across borders.

As the Netherlands plays a pivotal role in the transition towards regenerative practices, this third part of our study aims to deepen our understanding of the international ambitions and collaborations of regenerative initiatives. Specifically, we seek to identify the most effective ways for the Dutch government to support regenerative agriculture within the Netherlands and facilitate international cooperation with especially combi-country[1]. Combi-countries represent countries from 14 emerging markets in Europe, Africa, Asia, and South America where the Dutch government and entrepreneurs are joining forces to seize opportunities and work on sustainable agricultural chains. Our review found that 90% of the initiatives engage in international collaborations to foster the wider adoption of regenerative agriculture. To gather detailed insights, we randomly selected 15 initiatives for semi-structured interviews from a total of 199 initiatives pursuing or contributing to regenerative agriculture. These selected initiatives varied in type (e.g., NGO, financial institution) and scale (small or large), resulting in nine successful interviews (see Table 2). Supplementary materials S7 contains the detailed set of questions asked during the interview in a survey format.

[1] Egypt, Ghana, Morocco, Nigeria, Senegal, Ivory Coast, Kenya, South Africa, Bangladesh, India, Indonesia, Vietnam, Colombia, and Ukraine.

Table 2. *Characteristics of initiatives that were interviewed to specifically address their ambitions on internationalization.*

No.	Initiative	Description	Size
1	Financial institution	Impact investing	Medium
2	NGO; farmer	Gardens and food forests	Medium
3	Financial institution	Impact investing	Very large
4	Advisory enterprise	All-round farm advise	Very small
5	Advisory enterprise	Healthy food	Very small
6	NGO	Land regeneration	Medium
7	NGO, consumer group, press and media	Regeneration movement	Small
8	Processor	Vegan cheese	Medium
9	Advisory	Hemp; cannabis	Small

5.1 International collaboration

After interviewing the nine initiatives, we found that most initiatives were actively involved in international activities and had ambitions to expand their activities in knowledge sharing (six out of nine initiatives) and building local networks (two out of nine initiatives). Additionally, other international activities included providing training and education, financing regenerative initiatives, promoting regenerative agriculture, trade, conducting impact assessments, and hosting conferences on regenerative healthcare. The activities were aligned with the specific orientations of the companies; for example, it is expected that processing companies focus on market expansion, while impact investment companies aim to finance regenerative initiatives. Nevertheless, knowledge sharing about regenerative agriculture emerged as a key activity among the interviewees. The reasons for engaging in these activities varied among the initiatives as well as the countries in which they were involved. The reasons for engaging included improving awareness on topics such as 'one health,' promoting regenerative agriculture practices, reducing landscape degradation, building social support, and encouraging regenerative agriculture for a more sustainable world. The types of collaborations they engaged in or were willing to engage in ranged from working with governments to civil society organizations. Most frequently mentioned were NGOs, specifically EARA and Top 50 Farmers, as well as various private sector companies like ReNature. Overall, for future collaborations in for example cluster formation, the initiatives were open to working with any entities sharing the same mindset and not competing for market share. Although most initiatives were nationally oriented, they also engaged in international collaborations to already varying extents, particularly across Europe (5 out of 9 initiatives) and other parts of the globe (Table 3). The motives for working in European countries included already established connections and suitable infrastructure, which facilitate easier collaborations.

Table 3. *Countries identified by initiatives as either actively involved in or aspiring to collaborate on regenerative agriculture. Countries with an asterisk (*) represent combi-countries.*

Continent/ country	Active (n)	Ambition to be active (n)	Continent/ country	Active (n)	Ambition to be active (n)
Europe	**5**	**6**	**Africa**	**2**	**2**
Denmark	4		Kenya*	1	
France	2	1	Tanzania	1	
Belgium	2		Rwanda	1	
Germany	2		Congo	1	
United Kingdom	2		Uganda	1	1
Sweden	1		**North-America**	**3**	**1**
Spain	1	1	**South-America**		**1**
Portugal	1	1	Caribbean		1
Czech Republic	1		**Australia**	**1**	
Romania		1	**Asia**	**1**	**2**
Ukraine*		1	India*	1	2
Italy		1	Philippines	1	1
ABC Islands		1	Indonesia*	1	1
SSS Islands		1	Thailand		1
			Malaysia		1

Given the Dutch government's focus on collaborating with combi-countries, we found that various initiatives collaborated with Ukraine, Kenya, India, and Indonesia. The initiatives chose to work in these countries due to the high need for supporting sustainable development. Although future collaborations were viewed positively, entering new markets through cluster formation elicited more reserved responses. Four initiatives expressed interest and generally anticipated being ready for such ventures within 1 to 10 years. More detailed information on international collaboration is presented in supplementary materials S8.

5.2 Barriers and governmental support in international collaborations

The interviews highlighted 13 divergent barriers to advancing international collaborations (Table 4). Financial challenges emerged as a major obstacle, being mentioned nine times. Securing grants was particularly difficult because many regenerative outcomes were only observable many years after the grant period ended. The process of applying for funding was also extremely time-consuming, often requiring full-time effort, which left little room for other essential activities. Furthermore, initiatives without local registration faced difficulties in accessing local funding sources, hampering international collaborations. Additionally, viable business models remain a barrier as the true costs of regenerative products are not fully covered by consumers and producers. Finding reliable local partners was another critical challenge, as it involved a high level of trust and careful selection, making it a complex and sensitive process. Bureaucratic hurdles further complicated the situation, with extensive paperwork required to coordinate activities across different countries, consuming significant time and resources. Personal and organizational principles limited broader collaborative opportunities. Some individuals and organizations, preferred to focus on local efforts, which restricted the potential for wider partnerships. Specific sector-related barriers were also mentioned, such as the sustainable sourcing of fat-based products like coconut and palm oil for vegan cheese, which were commonly produced through unsustainable practices. Regulatory barriers posed significant challenges as well as well as the fragmented online infrastructure complicated the process of understanding regulations, applying for grants, attending conferences, and accessing scientific papers. This disjointed digital landscape added another layer of complexity to managing and advancing international collaboration in regenerative agriculture.

Table 4. *Barriers mentioned by initiatives during international collaborations.*

#	Barriers	Description	Mentioned (n)
1	Financial	Hard to get grants, you need to deliver on your outcomes which will maybe be seen after many years after grants ends	3
2	Network	Finding local partners (e.g. find reliable local partners > it is a trust exercise)	2
3	Financial	Continued financing for initiatives; needed as consumers and producers are not paying the true costs	2
4	Financial	Hardly have time to apply for funding, this is a full-time job	1
5	Financial	Cannot access local funding because initiative has no local registration	1
6	Bureaucracy	Paperwork to arrange things with different countries	1
7	Resources	Sourcing fat-based products sustainably (e.g. coconut or palm oil are not sustainable)	1
8	Resources	Volume, your produce needs to be substantial to move towards an international market	1
9	Regulation	A lot of specific regulation that hinder collaboration for RA (e.g. hemp stamps cannot be used for biochar, mulch, etc. due to little THC content)	1
10	Regulation	Also regulations are different across borders which makes collaborations challenging	1
11	Personal	Against personal principles (work locally) and those of Commonland	1
12	Personal	Little value addition	1
13	Infrastructure	Online infrastructure is fragmented (e.g. to apply for grants, conferences, scientific papers)	1

The interviews revealed various requests for government support to facilitate international collaborations (Table 5). These requests were primarily focused on financial aspects, such as assistance in obtaining grants, subsidies, and improved financial incentivization schemes. Respondents emphasized that to stimulate initiatives to enter (inter)national markets through cluster formation, the government could play a crucial role by connecting different food system actors and proposing pre-made clusters. However, certain prerequisites were necessary for engaging in such clusters: collaboration with local initiatives, a clear strategy, external financing to organize these clusters (e.g., from the government or philanthropic

sources), and ensuring that initiatives are not competing with each other. Other forms of support suggested included proactive outreach by governments to regenerative initiatives, rather than waiting for initiatives to seek support. This could involve assistance with communication, branding, training, and invitations to conferences and seminars.

Table 5. *Forms of governmental support that would facilitate international collaboration mentioned by initiatives.*

#	Requests for support:	Mentioned (n)
1	Grants, subsidies, incentive schemes (from governments or impact investors)	5
2	Connection with other actors	5
3	Regulations (these are currently restricting)	2
4	Invite to conferences/seminars (free of charge)	2
5	Actively engage/support regenerative models that work	2
6	Provide trainings (get paid for that by governments)	1
7	Government can put more effort in approaching changemakers instead of vice versa	1
8	Communication	1
9	Branding	1

5. Conclusions and recommendations

This study aimed to elucidate the state of regenerative agriculture in the Netherlands, investigating the dynamic network of actors including businesses, research institutions, governmental bodies, and non-governmental organizations. By reviewing the literature and interviewing various initiatives, we sought to provide a comprehensive understanding of the landscape of regenerative agriculture and its (inter)national ambitions. Our findings show that the Netherlands is increasingly engaging in regenerative agriculture. We discovered a significant willingness among stakeholders across the entire farm-to-fork chain to commit to regenerative agriculture. This commitment encompasses individual pioneering efforts by farmers as well as public-private partnerships engaged in large funding strategies (e.g. Re-Ge-NL, a €260 million project) fostering a national transition towards regenerative agriculture.

The study identified 199 regenerative initiatives across the country, with a significant concentration in Amsterdam, Rotterdam, and Wageningen. These initiatives varied widely in type and size, encompassing small farms to large multinational processing companies, and advisory enterprises. Notably, farmers, processing companies, and advisory enterprises constituted the majority of the initiatives. The diversity within these categories, especially among farmers, highlighted the broad adoption of regenerative practices across different farming systems and soil types. The initiatives primarily focused on environmental themes, such as soil health and biodiversity, but also addressed socio-economic dimensions to a lesser extent. Practices like the use of cover crops, green manures, and crop diversity were prevalent. However, the extent and type of practices varied, with some initiatives aiming for the complete elimination of harmful practices, while others sought to reduce their use. This variation reflected a shared commitment to the same goals across initiatives, though they differed in their preferred approaches to implementing practices.

Interviews with nine selected initiatives revealed their active involvement in international knowledge sharing and building local networks. They engaged in various activities, including training, education, financing regenerative initiatives, and promoting regenerative agriculture. While many initiatives collaborated internationally, especially within Europe and North America, they also expressed interest in expanding to emerging markets in Africa, Asia, and South America. The Dutch government's focus on collaborating with combi-countries was echoed by several initiatives already engaging with countries like Ukraine, Kenya, India, and Indonesia. However, the study also identified significant barriers to advancing international collaborations. Financial challenges, finding reliable local partners, and bureaucratic hurdles were frequently mentioned. Securing grants was particularly difficult due to the long-term nature of regenerative outcomes. Regulatory barriers and fragmented online infrastructures further complicated international collaboration. Some initiatives preferred to focus locally, limiting broader partnerships. Although this study conducted interviews with nine out of 199 initiatives, the findings and lessons learned are somewhat limited. However, these initial interviews revealed several requests for government support that organizations like RVO could address to promote (inter)national collaborations in regenerative agriculture. These included:

- strong governance in relation to regulation;
- assistance in obtaining grants, subsidies, and improved financial incentivization schemes;
- connecting different food system actors by proposing pre-made clusters;
- proactive government engagement in support with communication, branding, training, and invitations to conferences and seminars.

In conclusion, while the Netherlands has made significant strides in promoting regenerative agriculture, there remain challenges to fully realizing its potential on an international scale. Addressing financial, regulatory, and logistical barriers, along with enhanced governmental support, could further strengthen the adoption and impact of regenerative practices both nationally and globally. This study provides a foundation for understanding the current landscape and offers insights into optimizing strategies for promoting regenerative agriculture in the Netherlands and beyond.

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Supplementary materials

S1: Search queries and exclusion criteria for finding regenerative initiatives

Search queries:

Database	Draft search queries	Filters
Google Advanced Search	"regenerative agriculture" OR "regenerative farming" OR "regeneratieve landbouw"	Regio: Nederland
LinkedIn Advanced Search	regenerative agriculture OR regenerative farming OR regeneratieve landbouw	Location: the Netherlands

Exclusion criteria:

- Needs to have an accessible website, ONLY farmers maybe included via LinkedIn (but must be interviewed afterwards)
- Needs to use the term "regenerative farming" or "regenerative agriculture" or a literal translation in Dutch
- Only websites are considered that are in English or Dutch
- LinkedIn is used for snowballing to actor websites

S2: Description of initiative types and criteria for size

No	Tier 1	Description	Tier 2
1	Supplier	Initiatives that produce or provide resources to farmers	e.g. animal feed, fertilizers, pesticides seeds, machinery, services, materials
2	Farmer	Agricultural producers who implement regenerative practices on their land	e.g. dairy, arable, fruit, chicken, beef, mixed
3	Processor	Entities or companies that undertake the transformation of raw materials or components into finished or semi-finished products.	e.g. meat, milk, chips
4	Distribution or aggregation	Initiatives that transport agricultural products between initiatives	e.g. logistic companies
5	Retailer	Businesses or individuals that sell goods or services directly to consumers.	e.g. web shops, supermarkets, farmer markets
6	Consumer group	Community and consumer advocacy groups who support and promote the purchase of products from regenerative agriculture	e.g. groups that promote vegan or vegetarian diets
7	Resource & waste recovery	Initiatives that separate materials from waste that can be recycled into new products or used as an energy alternative.	e.g. waste recovery and processing companies
8	Financial institution	Financial institutions and investors interested in supporting and financing regenerative agriculture projects and initiatives.	e.g. banks, philanthropic organizations, impact investors
9	Government agency	Government agencies and regulatory bodies responsible for overseeing agricultural practices, environmental protection, and land management.	e.g. regional or national policy initiatives
10	Press and media	Initiatives that can influence public opinion and perception of the organization.	e.g. journalists, reporters, and media outlets
11	NGO or civil society organization	Non-Governmental Organizations that advocate for sustainable and regenerative agricultural practices	e.g. nature conservancy groups, branche organization, thinktanks
12	Research or education	Research institutions and scientists conducting research on regenerative agricultural techniques, soil health, and ecosystem services.	e.g. universities, applied science schools, commercial research institutes
13	Knowledge or innovation project	Temporary endeavours undertaken to create a unique product, service, or result.	e.g. projects within the private sector or from governmental bodies
14	Advisory or consultancy enterprises	Services that concentrate on providing strategic guidance and advice on high-level business issues or specific problems and challenges.	e.g. big international consultancy groups, local farm advisory services
15	Land tenures	Initiatives that hold land and either provides, sells, or leases it to farmers	e.g. big landowners that sub contract farmers, or initiatives that collectively buy land for regeneration
16	Other	Other initiative types not captured by the current classification	e.g. lawyers

Score	**Cat.**	**General Farmer**	**Arable farmer**	**Dairy farmer**	**Pig Farmer**	**Bulb Farmer**	**Horticulture**	**Fruit orchard**	**Private sector**	**Project**
		SVP* (x1000€/year)	Area (ha)	Cows (n)	Pigs (n)	Area (ha)	Area (ha)	Area (ha)	Employees (n)	Capital (€ x 1000)
1	very small	<25	<10	<50	<500	<25	>1.25	<1	<5	<100
2	small	25><60	10><50	50><100	500-1,500	25-50	1.25-2.5	1-5	5><10	100><500
3	medium	60><100	50><100	100><150	1,500-3,000	50-100	2.5-5	5-10	10><50	500><1,000
4	large	100><250	100><300	150><250	3,000-7,500	100-150	5-10	10-20	50><100	1,000><5,000
5	very large	>250	>300	>250	>7,500	>150	>10	>20	>100	>5,000
	Ref	*LNV, 2024*	*CBS, 2018*	*Agrimatie, 2018*	*Agrimatie, 2018*	*Agrimatie, 2023*	*Agrimatie, 2023*	Lei, 1998	CBS, 2021	*Expert judgement*

S3: Initiatives that show a commitment to regenerative agriculture in the Netherlands

no	Name innitative	no	Name innitative	no	Name innitative
1	Bodemzicht	43	De Krim - Landbouwbedrij	85	VP Capital
2	Peter Oosterhof	44	Vlierhoven	86	Wire group
3	Re-generation	45	Soil Heroes	87	CêleVita
4	RE-GE-NL	46	Klompe Landbouw	88	Chantal van Genderen
5	TiFN's Regenerative Farmi	47	Boer & Business in Balans	89	Nutricia
6	PPS Verdien- en ontwikkel	48	CO2L Farming Advies	90	LaMi
7	Wij.land	49	De regeneratieve boerderij	91	Stimuleringsfonds creatiev
8	Wageningen University	50	Met natuur Mee	92	CZAV
9	Lenteland	51	Knorr	93	Samyama
10	Agrifirm	52	Unox	94	De Bolster
11	Denkavit	53	Food Hub	95	De Regeneratieve School
12	BO Akkerbouw	54	NatuurlijkDivers	96	Stichting in Goede Aarde
13	Bionext	55	Allbirds	97	Rijksdienst voor Onderner
14	Aardpeer	56	Regeneratieve Landbouw V	98	De Eendracht U.A.
15	Boerderij Buitenverwachti	57	Huiberts Biologische Bloe	99	Climate Neutral Group
16	Boerderij de Eenzaamheid	58	Bij De Oorsprong	100	KAIROS | Regenerative Agr
17	Boerderij Engelhof	59	KipEigen	101	Stichting Regeneration
18	Commonland	60	Het Grond Verbond	102	Open Universiteit
19	Bi-Jovira	61	De Eemlandhoeve	103	Nescafe
20	De Elegast: Elegast Cidery	62	Onze Groenteboer	104	Better Cotton
21	De Regeneration Foundati	63	Voedselbos Valthe	105	Cargill
22	De Woldtuin	64	Gelukkige Groentes	106	Tiny House Beweging
23	Eva Vos Agro-ecologisch o	65	Weelde Woud	107	Water, Land & Dijken
24	Schevichoven	66	Pymwymic	108	Labl
25	DLV Advies	67	Rabobank	109	This Side Up
26	Invest-NL	68	Nestlé	110	Wakuli
27	100 hectare regeneratieve	69	De buitenbrigade	111	ABN Ambro
28	FarmOn	70	Soil4U	112	Boeren-Natuurlijk!
29	De impactboerderij	71	De Biesterhof	113	Dior
30	PUUR Permacultuur	72	Land van Ons	114	Lush
31	BD grondbeheer	73	Herenboeren	115	FARWIN
32	Foodvalley	74	NWB Bank	116	Tuinderij de Voedselketen
33	Van Lanschot Kempen	75	Sustainable Finance Platf	117	SoilBase
34	Buitenbrigade	76	Noordwijde	118	Unilever
35	Pure Graze	77	Purina	119	AMCS
36	Edzemaheerd	78	Danone	120	Vruchtbare Kringloop Ove
37	Erve Kiekebos	79	Erasmus Universiteit Rotte	121	LOKOL
38	Grutto	80	Rijksuniversiteit Groninge	122	Royal Queen Seeds
39	De natuurverdubbelaars	81	Has Green Academy	123	McCain
40	Wiki Farmer	82	Horaholm	124	Rexil-Agro
41	Het Groene Brein	83	Louis Bolk	125	van Hall Larenstein
42	Gebiedscoöperatie Zuidwe	84	Universiteit Utrecht	126	Aeres Hogeschool

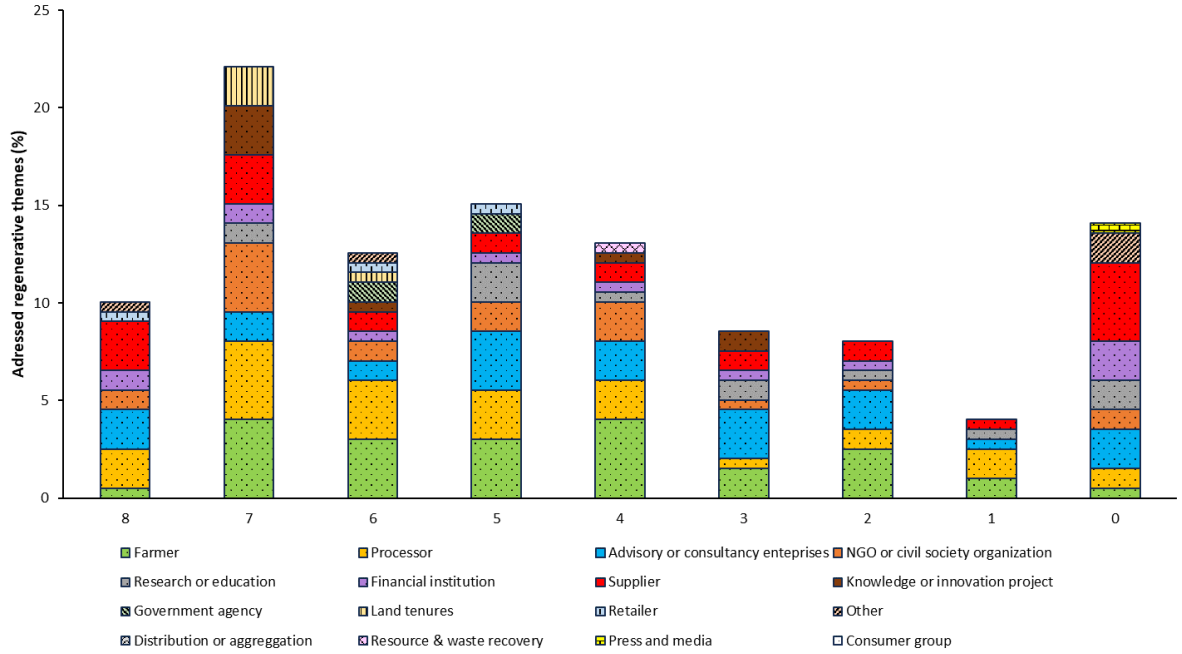
no	Name innitative	no	Name innitative
127	Bureau 7TIEN	170	Krulstaartje
128	Botmas	171	Groenteteelt Bedrijf Appel
129	Fresh Ventures Studio	172	Hoogeboom Groente
130	Wijngaard De Jongens	173	Jara
131	Tomasu	174	Squarewise
132	The Knitwit Stable	175	Wijngaard Aan de Breede
133	SCAVE.World	176	Landgoed Ulvenhart
134	ReNature	177	Almosto
135	NOW School	178	SVZ
136	Houberg	179	Jammiekeshoeve
137	Hide&B	180	Sucden Coffee
138	Rineke Dijkinga	181	ZLTO
139	Ecosystem Restoration Co	182	LTO
140	HarvestCare	183	AidEnvironment
141	Cycle to Farms	184	Springtail
142	Metabolic	185	Land of Plenty
143	Doktar	186	Planet
144	Next Food Collective	187	Peterson
145	Radbout Universiteit	188	Whole Brands
146	Willicroft	189	Porticus
147	Farming Communities	190	DéWarrier
148	Investing in Regenerative A	191	Diageo
149	Yara	192	Kraft Heinz Company
150	DGB group	193	Global Landscape Forum
151	Eosta	194	Terragon Nature Lab
152	Cosun	195	Rainforest Alliance
153	ASEED	196	WWF
154	FrieslandCampina	197	B Lab Benelux
155	Stichting DOEN	198	Patagonia
156	Buitenleeft	199	Schneider Electric
157	FoodChain ID		
158	Hugo Boss		
159	Primark		
160	ASN Bank		
161	UGG		
162	Amped		
163	Icebreaker		
164	The North Face		
165	Fibershed		
166	De Beekhoeve		
167	Arla		
168	SoilBeat		
169	Yugen Forest		

S4: International orientation

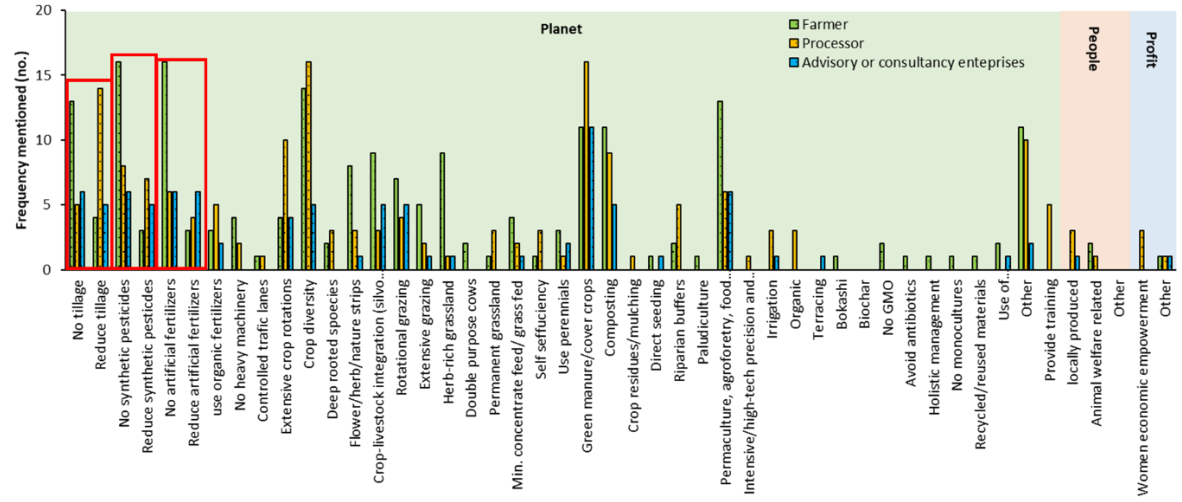
Score	*Description*
1	*No - only national*
2	*Sometimes - for knowledge sharing*
3	*Regularly - for projects, trade, knowledge sharing*
4	*Yes - engaged in international trade of materials, knowledge, and collaboration; head office is **inside** of the Netherlands*
5	*Yes - completely focused on international trade of materials, knowledge, and collaboration; head office is **outside** of the Netherlands*

	Score				
Initiative type	**1**	**2**	**3**	**4**	**5**
Total	39	47	54	18	34
Farmer	25	13	1	0	0
Processor	1	1	8	7	18
Advisory or consultancy enterprises	3	13	11	3	2
NGO or civil society organization	0	9	4	2	5
Research or education	0	2	11	0	1
Financial institution	0	2	7	3	1
Supplier	0	0	6	3	3
Knowledge or innovation project	5	1	2	0	1
Government agency	0	4	1	0	0
Land tenures	3	2	0	0	0
Retailer	1	0	1	0	1
Other	1	0	0	0	1
Distribution or aggregation	0	0	1	0	0
Resource & waste recovery	0	0	0	0	1
Press and media	0	0	1	0	0
Consumer group	0	0	0	0	0

S5: Regenerative themes



S6: Regenerative practices



Regenerative practices mentioned once						
	Planet (n=35)				People (n=4)	Profit (n=4)
no	All production systems	Crop production	Livestock production	Fibre production	Social	Economic
1	bio inocculants	Food crops only	anaerobic digesters	Need to fullfill CottonConnect	local employees	financial yields and costs shared among producers and consumers
2	bushes and trees as wind borders	improved coffee varieties	animal diversity	Need to fullfill Sustainable Cotton Programme of Primark	is a cooperation	True pricing
3	chort value chain	pest resistant crops	double purpose cows	ZQRX programme	community	Financial diversification
4	Dry farming		Grassland diversity	95% plant-based fibre	social activities	long-term farm partnerships
5	include bees		milking robot	5% fibre of petrochemical based	no tail cutting	
6	integrated weed management		Minimize artificial light	89% of marino wool		
7	native trees		No hormones			
8	natural pollination		no intensive mowing			
9	No dependence on fossil fuel use					
10	no residual streams					
11	only use machinery on dry periods					
12	protect native species					
13	replanting trees					
14	shade tree planting					
15	Shells					
16	Stoneflower					
17	water reservoirs					
18	worm farming					

S7: Survey questions

1. General information:
    a. Name?
    b. Organization?
2. To which type of actor does your organization/initiative belong?
3. What size is your organization?
4. Which regenerative themes are your focusing on?
5. Are you active in international activities or collaborations regarding regenerative agriculture?—specifically mention combi- countries[2]
    a. In which countries?
    b. What activities?
    c. With who are you collaborating?
    d. Why are you doing this?
6. Does your initiative have ambitions for international activities or collaborations regarding regenerative agriculture?
    a. In which countries?
    b. What activities?
    c. With who do you want to collaborate?
    d. Why do you want to do this?
7. What barriers are you facing in international collaborations? (e.g. bureaucracy, finding partners, language and culture barriers, competition, financial barriers, logistics and infrastructure challenges, personnel safety)
8. What forms of governmental support would facilitate international collaboration for your initiative regarding regenerative agriculture? (e.g. subsidies, incentive schemes, trade missions, trade fairs, communication, branding, connections to other food system actors, training, regulations)
9. Would your company be interested to enter an international market in cluster formation? (e.g. in a cluster with other companies, research institutes, and the Dutch government)
    a. What forms of (governmental) support would facilitate this? (e.g. subsidies, incentive schemes, trade missions, trade fairs, communication, branding, connections to other food system actors, training, regulations)
    b. What is your company's preferred timeline for entering an international market in cluster formation?
    c. What are the prerequisites for your company to enter an international market in cluster formation? (e.g. mitigation of risk, clear strategy, understanding of legal compliance requirements)
10. Have you received help/support from RVO in the past when starting up your activities in these countries? What kind of support and how did you experience this?
11. Can RVO approach you for concrete next steps in supporting regenerative agriculture? (e.g. connect you to other actors, create clusters, financial support)

S8: Interview results

#	Q4b;5b: International activities	Current (n)	Future (n)
1	Knowledge sharing	6	6
2	Building local networks	2	2
3	Training & education	1	2
4	Financing	1	1
5	Promoting regenerative agriculture	1	1
6	Trade	1	1
7	Build models to improve efficiency and scale production	1	1
8	ESG impact assessments	1	1
9	Host conference about regenerative health care		1

[2] Egypt, Ghana, Morocco, Nigeria, Senegal, Ivory Coast, Kenya, South Africa, Bangladesh, India, Indonesia, Vietnam, Colombia, and Ukraine.

#	Q4c;Q5c: International collaborations	Current (n)	Future (n)
1	NGO's	5	3
	Top 50 farmers	2	0
	EARA	2	0
2	Privat sector	4	1
	NAPRAGRO, AGroSymbio vzw, Sky Agriculture / Cre-agri	1	0
	Renature	1	0
3	Government	2	2
	Irish government	1	0
	EIT Food	0	1
4	Everyone: if same philosophy	1	5
5	Everyone: early phase initiatives	1	1
6	Suppliers	1	1
7	Farmers	1	1
8	Distributors	1	0
9	Industry	1	0
10	Civil society	1	0
11	Local landscape designers	0	1
12	Researchers	1	1
	University of Wisconsin-Madison	1	0

#	Q4d;5d: Reasons for international collaborations	Current (n)	Future (n)
1	Market expansion	2	2
2	Improve awareness on topics such as 'one health'	1	1
3	Promote regenerative agriculture practices	1	1
4	Reduce landscape degradation	1	1
5	Build social support	1	1
6	Encourage regenerative agriculture for a more sustainable world	1	1
7	knowledge sharing	1	1
8	Previous experience	0	1
9	Familiar with language	1	0
10	Introduction resowing	1	0

To explore the potential of nature to improve the quality of life