

Erasmus Platform for Sustainable Value Creation

Working paper

Financing regenerative agriculture

Regenerative finance solutions to restore and conserve biodiversity

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Rotterdam, May 2022.

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The Erasmus Platform for Sustainable Value Creation is an academic think-tank at Rotterdam School of Management, Erasmus University (RSM) that collaborates with leading sustainability experts in the financial sector. Through its strategic collaboration with NWB Bank, it participates in the Dutch working group on Biodiversity and Finance.

This publication has been drafted by Dieuwertje Bosma (bosma@eur.nl), manager/researcher at the Erasmus Platform for Sustainable Value Creation and Merel Hendriks (merel.hendriks@nwbbank.com), sustainability officer at NWB Bank. It could not have been completed without the excellent research support of Marlene Appel, MSc student in Global Business and Sustainability at RSM.

For this publication, several members of the working group on Biodiversity and Finance were interviewed. Furthermore, two organisations, BD Grondbeheer and Eco Burgerboerderij De Patrijs, opened their doors to us. We thank them for their time and inspiration. We thank Lidwin van Velden, CEO at NWB Bank and Prof. Dirk Schoenmaker of RSM for their constructive feedback and thoughts.

The Sustainable Finance Platform

The Sustainable Finance Platform is a cooperative venture of De Nederlandsche Bank (chair), the Dutch Banking Association, the Dutch Association of Insurers, the Federation of the Dutch Pension Funds, the Dutch Fund and Asset Management Association, Invest-NL, the Netherlands Authority for the Financial Markets, the Ministry of Finance, the Ministry of Economic Affairs and Climate, and the Sustainable Finance Lab. Platform members meet twice a year to forge cross-sectoral links, to find ways to prevent or overcome obstacles to sustainable funding and to encourage sustainability by working together on specific topics. The Sustainable Finance Platform fully supports this paper. However, the practices and advice described herein are in no way binding for the individual financial institutions comprising the industry organizations which are members of the Platform, nor are they committed to take any specific follow-up actions. Furthermore, this paper outlines private sector initiatives and as such does not contain any supervisory requirements.

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Van het Platform voor Duurzame Financiering

June 2022

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Executive summary

Biodiversity – the variability among all living organisms – is essential because it ensures the functioning of the biosphere which supports all life on earth. As such, the economy and society depend on biodiversity for the provision and regulation of ecosystem services, food production, water purification, flood protection, and climate change mitigation. However, continuous economic growth and our increasing demand for food, water, and natural resources lead to biodiversity loss and extinction. This calls for collective action from all sectors to restore and conserve biodiversity.

Biodiversity loss poses both risks and opportunities for the financial system. The financial sector depends on the functioning of the economy and society, which are in turn embedded in the biosphere. As such, biodiversity loss has direct financial repercussions and translates into financial risks. However, biodiversity also offers financing opportunities such as cost savings, new forms of income, and enhanced resilience against climate-related risks. Addressing the loss of biodiversity requires a mobilisation of public and private money. The financial sector can contribute to this by allocating funds to initiatives which restore and conserve rather than depletes biodiversity.

One such financing opportunity lies in regenerative agriculture which offers a way of farming that generates financial, ecological, as well as social returns in a regenerative way. Intensive agriculture is a primary driver of biodiversity loss as it is extractive of nature. Through greenhouse gas emissions, the expansion of farmland, and the intensification of agricultural production to feed a growing population, intensive agriculture destroys natural ecosystems and pose a long-term risk on environmental, social, and financial value. This highlights the urgent need to transform the agricultural sector. Financial institutions can play a role in this transformation by making it easier for nature-inclusive farmers to find financing.

To realise the transition to regenerative agriculture, several challenges must be overcome. Insights from interviews with members of the working group and financial institutions show that there is still considerable conceptual unclarity surrounding the concept of regenerative agriculture. The risks of financing regenerative agriculture initiatives are perceived to be high due to unpredictable weather conditions and constantly changing regulations. It also remains difficult to scale financing as many regenerative, nature-inclusive farms are too small to be financeable for financial institutions. For these reasons, the financial sector does not see regenerative finance as an opportunity to have positive impact on biodiversity. Rather, it still mainly approaches the topic of biodiversity loss from a risk reduction-angle and aims to minimise environmental harm.

The agricultural sector is currently characterised by high land prices, low margins for farmers, and a societal system that favours intensive over regenerative agriculture. The cases of BD Grondbeheer and Eco Burgerboerderij De Patrijs show that regenerative agriculture does not match the traditional risk-return paradigm of financiers. The high prices for agricultural land push farmers to intensify their operations which harms biodiversity. In addition, the absence of a true price for organic products and sustainable land management makes it difficult or farmers to generate sufficient returns. This shows how the current societal system still favours intensive agriculture which is unsustainable in the long-term. The systems case explores how a complex systems problem such as biodiversity loss also asks for a systems solution where multiple stakeholders bundle their forces.

A regenerative, sustainable agri-food system calls for fair costs, fair risks and returns, and a system’s transition. Based on these three building blocks, this paper develops a framework which outlines how the financial sector can positively contribute to biodiversity restoration and conservation through agriculture. It shows how regenerative agriculture can make its way to mainstream finance. Decoupling land from market prices allows farmers to lease the land at lower prices. This enables them to transition regenerative farming techniques since the guarantee that the land they lease will remain farmland indefinitely allows them to take a long-term sustainable land management perspective.

Producing healthy, organic products generates fair returns for farmers without having to intensify agricultural operations and managing land in a sustainable way can provide additional income. Ultimately, there is a need for a shift in mindset that reflects not only the financial, but also the social and environmental value of biodiversity and helps accelerate the transition towards a regenerative, nature-inclusive agri-food system.

Building blocks:	Problem analysis	Primary stakeholder	Solutions
1. Fair costs: Valuation of land	High land prices for farmland (€70,000/ ha) lead to intensification of agricultural practices and depletion of soil and biodiversity	Government	Fund for depreciation of nature-inclusive farmland to € 35,000/ ha.
2. Fair risk and fair return: Business model with good returns	Farmers’ income based on maximised production (quantity) at too low prices	Farmers	Income linked to quality
	Perception of risk associated with intensive farming is underestimated, lack of true risk	Banks	Lower interest rates for sustainably managed farmland and nature-inclusive farming and development of financial products
	Food for untenable low prices, lack of a true price	Consumers/ Government	Ensure a true price for healthy food
3. System’s transition	Big investments needed for conversion of farms	Government	A land consolidation fund for nature-inclusive farms (financed by nitrogen fund and banks) ¹
		Banks	

¹ This proposal has been written down in a (Dutch) memo by prof. Dirk Schoenmaker and Dieuwertje Bosma

1 Introduction

It is becoming increasingly clear that humanity not only faces a climate crisis but also mass extinctions and alarming rates of biodiversity loss. Issues such as biodiversity loss can be characterised as wicked problems since they represent systemic challenges that are ambiguous, difficult to define, and even more difficult to solve (Van Tulder, 2018). Collective action from all sectors is necessary to address this problem. The state, the market, and civil society all have a responsibility to restore and preserve biodiversity. Although financial institutions do not have a direct impact on the environment through their operations, they do indirectly affect it through their allocation function. The financial sector moreover relies on healthy ecosystems which do not function without biodiversity.

Despite increasing awareness, the financial sector approaches biodiversity loss predominantly from a risk reduction-angle by aiming to minimise negative impacts and cause “less harm” to the environment. Although it is clearly important to reduce activities that are harmful to the earth, adequately assessing risks strongly relies on measurable data, which is currently not always available. The ‘hunt’ for good data on biodiversity goes on, and scientists will chew on this topic for the next years. In the meantime, society cannot stay put. We should recognize the non-linear, integrated, and holistic constitution of natural and human systems (Costanza et al., 2016). Based on a more common-sense approach, the financial sector can already play an important role in protecting and restoring our precious ecosystems.

As part of the Dutch Sustainable Finance Platform that is chaired by De Nederlandsche Bank (DNB), the working group on biodiversity has teamed up with the Erasmus Platform for Sustainable Value Creation at Rotterdam School of Management, Erasmus University, to explore how financial institutions can contribute to the financing of biodiversity restoration and conservation. By looking at successful examples of nature-based farming solutions, this paper draws insights from their experience, learnings, and implementation barriers. In particular, and to narrow the scope of the project, the focus is regenerative agriculture as one form of combining biodiversity restoration with a business model. The goal of the project is to better understand what role financial institutions can play in financing biodiversity restoration and preservation and how regenerative agriculture initiatives can make their way to mainstream finance.

Cross-disciplinary networks are important in biodiversity finance: strategic partnerships have proven to “open up new avenues for thinking up innovative financial mechanisms”. But the challenge that remains is how to move financial innovation beyond simply repackaging existing solutions. The existing mismatch between investors and fundable biodiversity restoration projects needs to be minimised. Both the needs of investors and nature must be met (Anyango-van Zwieten, 2021). The working group can be of added value by using its unique position at the intersection of financial and knowledge institutions to answer: How can we finance agricultural projects that have a positive impact on biodiversity restoration and conservation? What can we learn from those examples? How can they be scaled up?

Exemplative case studies and interviews with members of the working group and financial institutions are used as a basis to illustrate the yields of biodiversity restoration for all parties involved. Based on this, a framework is distilled for future financing opportunities. This provides insights into what is needed to make regenerative biodiversity projects financeable and how financial institutions can address this daunting issue of biodiversity loss in a structured and standardised way. Therefore, the aim of this research project is to gain an understanding on the question of how financial institutions can contribute to the financing of ecology-based biodiversity restoration and conservation.

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2 Insights from literature

Biodiversity

The Convention on Biological Diversity defines biodiversity as the “variability among living organisms from all sources including inter, alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems” (CBD, 1992). Biodiversity ensures the functioning of the biosphere through the provision and regulation of ecosystem services, such as food production, water purification, flood protection, and climate change mitigation (OECD, 2019).

Our ecosystems have economic value as they provide humans with raw materials such as wood, fish, and crops which many people’s livelihoods and the economy in general depend on (Dasgupta, 2021). In fact, over 50% of global GDP depends on the functioning of biodiversity and ecosystem services (World Economic Forum, 2020). The importance of biodiversity is further illustrated by IPBES (2019):

- Over 2 billion people worldwide rely on wood fuel to meet their primary energy needs.
- More than 75% of global food crop types such as fruits and vegetables rely on animal pollination.
- Marine and terrestrial ecosystems sequester approximately 60% of all man-made carbon emissions, or 5.6 gigatons of carbon per year.
- Roughly 4 billion people are dependent on natural medicines for their health care.

Together, Costanza et al. (2014) estimate the economic value of all ecosystem services to be US\$ 125-140 trillion per year – more than 150% of global GDP (Costanza et al., 2014; Global Canopy, 2021).

The loss of biodiversity

This economic activity, however, comes at a cost. Our growing demand for food, water, and natural resources, is causing biodiversity loss and extinction, which threatens biosphere integrity and life on earth as we know it (Steffen et al., 2015). The main drivers of biodiversity loss are land and sea use change, direct exploitation, climate change, pollution, and invasive alien species (NGFS, 2022). Due to the inherent interconnection of climate change and biodiversity, changes in one system also affect other systems via feedback loops, multiplying the negative effects and leading to further losses in biodiversity with potentially irreversible long-term consequences (Dasgupta, 2021; IPBES, 2019; Pisano, 2012; Rockström et al., 2009) – in [Appendix 2](#) we elaborate on this interconnection. Environmental degradation and biodiversity loss are worldwide phenomena that are becoming more alarming every day and are one of the greatest risks to society and the economy (Van Toor et al., 2020). As such, they pose significant threats to financial and monetary stability since the financial system is deeply embedded in the biosphere (Dasgupta, 2021).

Slowing down the loss of biodiversity through biodiversity conservation² and the restoration of nature is a pivotal task for the global economy in the next decade. It asks for a resource mobilisation of private and public money (Global Canopy, 2021). We need to manage our ecosystems in ways that “allow them to continue to sufficiently produce healthy food, protect and restore biodiversity, return carbon into the soil and manage water supplies while at the same time improving livelihoods” (Commonland, 2020). Since biodiversity provides the foundation for life on earth, all sectors – state, market, and civil society – have a responsibility to contribute towards restoring and conserving it. This so-called whole-society approach requires participation not only from governments but also from business and the financial sector, academia, civil society, youth, and indigenous

² Seidl et al. (2021) define biodiversity conservation as “preservation, maintenance, sustainable use, recovery and enhancement of the components of biological diversity and, importantly, threatened and endangered species conservation”

peoples and local communities (Mrema & Pulgar-Vidal, 2021). By allocating funds to biodiversity-enhancing initiatives, financial institutions can positively contribute to this end.

Biodiversity finance: a two-sided coin

The financial sector relies on the functioning of the economy and society, which are in turn embedded in the biosphere. This embedded view is often depicted as a wedding cake where the biosphere represents the foundation upon which other layers (society and the economy) are built (see Figure 1).

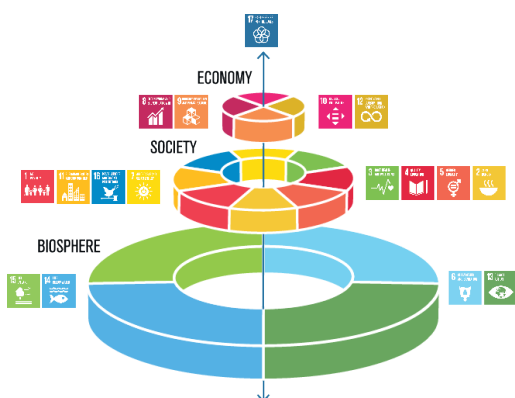


Figure 1: Wedding Cake retrieved from Stockholm Resilience Center³

Limiting harm to the biosphere should be in sequential accordance with the mitigation hierarchy. The mitigation hierarchy starts with avoidance, then minimisation, then rehabilitation or restoration, and finally offsetting (Arlidge et al., 2018).

Risks

At the same time, financial institutions also impact nature and its resilience to adapt to shocks and changes. This results in a double materiality of finance and biodiversity: financial institutions materially impact biodiversity and nature-related impacts are material for financial institutions (NGFS, 2022; Figure 2). The concept of double materiality is a key accounting principle that states that information should be disclosed if it is important and material to a company. In the case of biodiversity, the financial sector impacts biodiversity through its lending and investing practices as well as by facilitating business activities that cause environmental degradation.

However, the loss of biodiversity also has direct financial repercussions and translates into financial risks as outlined below, making biodiversity material for the financial sector (Täger, 2021). Besides the financial risks and negative effects on reputation, biodiversity is also material for financial institutions because a destabilisation of the climate system would inevitably lead to a destabilisation of the financial system as well (Van Toor et al., 2020). Therefore, it is important to not only consider the risks of finance on biodiversity, but also to recognise the importance of biodiversity for finance and the opportunities for positive impact.

³ <https://www.stockholmresilience.org/research/research-news/2016-06-14-the-sdgs-wedding-cake.html>

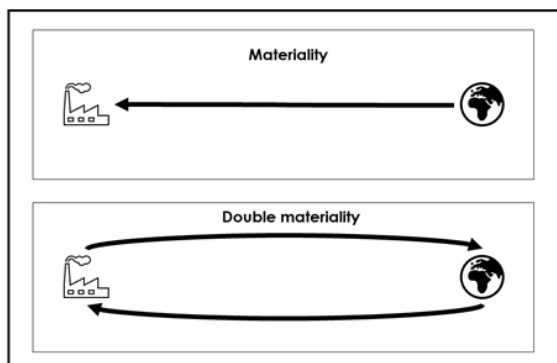


Figure 2: Double Materiality retrieved from London School of Economics⁴

For the financial sector, biodiversity loss represents a source of physical, reputational, and transition risks (Van Tilburg, Bosma & Simić, 2022). Financial institutions are exposed to physical risks through the organisations they finance. Companies are dependent on ecosystem services, such as water, air, and soil, for the production of goods and services. This means that financing such organisations exposes financial institutions to physical risks as natural resources are depleted and the vital ecosystem services can no longer be guaranteed. This could have a negative impact on their financial position. Companies, and consequently the financial institutions, are in turn also impacted by environmental controversies which can cause reputational risks (Van Toor et al., 2020). Lastly, inadequate reactions to biodiversity degradation can bring about transition risks as organisations fail to adapt to policy changes and new regulations regarding biodiversity criteria. One example is the Dutch nitrogen crisis which resulted in high costs for nitrogen-emitting activities and required financial institutions to reduce their investments in such practices (Van Toor et al., 2020).

While more and more financial institutions have policies in place which exclude financing environmentally damaging activities, this approach has not been effective in significantly reducing the flows of finance to unsustainable practices (Kedward et al., 2020). This calls for precautionary approach to nature loss in the financial sector and a greater focus of financial institutions on addressing drivers of environmental risks for the financial sector. Such precautionary approaches do not focus on plausible scenarios but rather on worst-case outcomes and then construct policies to avoid them. This requires active intervention from key players in the financial sector to shape and influence the market (Kedward et al., 2020).

Opportunities

Besides mitigating financial risks, biodiversity also offers financing opportunities such as cost savings, new forms of income, and, more importantly, enhanced climate resilience and hedging against climate-related risks from biodiversity loss (The Sustainable Finance Platform, 2020).

First, financing biodiversity restoration and conservation results in cost savings as fewer inputs are needed for production. In the case of agriculture for instance, less artificial fertiliser is needed to achieve crop yields and sustainably managed land can remain arable for longer periods of time. In addition, the costs of inaction are considerably more expensive (OECD, 2019). Between 1997 and 2011 alone, it is estimated that the world lost US\$ 4-20 trillion per year in ecosystem services due to land-cover change and US\$ 6-11 trillion per year from land degradation (OECD, 2019). Thus, investing in biodiversity can result in significant cost savings in the long-term. Second, there is a growing number of financial opportunities related to biodiversity restoration and

⁴ <https://www.lse.ac.uk/granthaminstitute/news/double-materiality-what-is-it-and-why-does-it-matter/>

conservation such as green bonds, payments for ecosystem services, sustainable investment funds, and natural capital financing facilities. The current landscape of biodiversity financing is described in more detail in Table 1.

Furthermore, investing in biodiversity also positively contributes to climate change mitigation efforts and supports the earth's resilience to manage extreme weather conditions as well as the growing demand for resources and energy. Investing in biodiversity helps strengthen climate resilience as healthy soils and a sustainably managed planet are better positioned to handle droughts and floods and continue to provide ecosystem services in the long-term (Van Toor et al., 2020).

Lastly, investments in biodiversity-enhancing projects can also help financial institutions hedge against climate-related risks associated with biodiversity loss. Since the economic and financial sectors depend on the functioning of nature, investing in biodiversity preservation helps reduce the financial risks – physical, reputational, and transition risks – associated with the destruction of biodiversity.

Current biodiversity finance

Although we currently spend an estimated \$143 billion on biodiversity per year, between \$722 and \$967 billion are needed by annually 2030 to conserve biodiversity globally (Global Canopy, 2021). This results in an annual biodiversity conservation financing gap of \$598–824 billion per year. To close this gap, private sector financing is crucial. There are already many initiatives emerging. The current landscape of biodiversity finance solutions is summarised in Table 1. A more elaborated overview can be found in [Appendix 1](#).

Table 1. Overview of current biodiversity finance solutions

Source of financing	Instrument	Example	What it entails	<ul style="list-style-type: none"> Pros Cons 	Unique aspect
Public or private	Payment for ecosystem services	ProWater	Instead of flat subsidies, subsidy amounts are linked to ecosystem-services s.a. water retention.	<ul style="list-style-type: none"> Result-based more effective But higher risk for farmer due to uncertain external influences 	Result-based or action-based remuneration
	Sustainability-linked loan	Various	A loan is linked to sustainability KPI's and goals and/or progress targets. If goals are achieved a discount is given on the interest amount.	<ul style="list-style-type: none"> Financial and ecological impacts are aligned Effectiveness strongly depends on sustainability performance indicators 	Interest margin on loan is linked to improvement of sustainability metrics
Public-non-profit	Subsidy	Aanvalsplan Grutto	A subsidy is given for changing land management practices to more nature inclusive practices.	<ul style="list-style-type: none"> Ensures continuity through long-term management contracts Protecting a single species is very narrow approach 	Plan with concrete policies for protecting endangered population of meadow birds
Public-private	Blended finance fund	Sustainable Agriculture Investment Fund	Co-financing of loans by blending public and private money through a fund structure.	<ul style="list-style-type: none"> Public party takes part of risk through initial investment which incentivises private investment Limited initial loan 	Co-financed loans for organisations committed to improving the environment
	Financing Facility	Natural Capital Financing Facility	Seed capital for initial high risks investments into biodiversity solutions.	<ul style="list-style-type: none"> Initial public financing incentivises private parties to unleash larger investments Difficulty in aligning public and private interests 	EU program covers initial start-up costs of biodiversity investments
Private-civil society	Blended finance impact investing	Triodos Regenerative Money Centre	Civil society money is used to blend with private money to make the investment business case work.	<ul style="list-style-type: none"> Create social and environmental value by decoupling impact from financial returns 	Blended financing of donations and catalytic investments for projects that are too risky (low returns)

				<ul style="list-style-type: none"> Potential conflict between core business activities and sustainable investment practices 	for traditional investment products
Private-civil society	Bonds	Aardpeer sustainable agriculture bonds	Bonds are issued to buy land that is then leased to a farmer. Investments into the bonds can be done by individuals.	<ul style="list-style-type: none"> Even small and risky projects can be financed Difficult to scale, margins not competitive 	Private financing from individuals to provide agricultural land to nature-driven farmers
Private	Paying for ecosystem services	Rabo Carbon Bank	Carbon credits are issued for sequestration of carbon on farmland.	<ul style="list-style-type: none"> Financial incentive for sustainable solution No overall reduction in carbon emissions since saved emissions are used to offset more emission-intensive activities 	Carbon credits for sequestering carbon enable transition to regenerative agriculture
	Fund	Kempen SDG farmland fund	Pension fund money is used to make longer term investments into sustainable agriculture through a fund.	<ul style="list-style-type: none"> Aim for attractive long-term returns while enhancing biodiversity Sustainability KPIs are very context-specific 	Investment in farmland and agricultural properties to support sustainable and regenerative agriculture
		ASN biodiversity fund	Provides private individuals the opportunity to invest in investments that are otherwise only accessible to asset managers.	<ul style="list-style-type: none"> Prioritise impact on biodiversity over financial returns Higher risk for investors, especially during start-up phase 	Private fund aimed at restoring and protecting biodiversity through shares in and private loans to companies
Public	Miscellaneous	BIOFIN financing solutions	BIOFIN offers an overview of many different sorts of biodiversity financing instruments.	<ul style="list-style-type: none"> Large variety of different instruments, tools, and strategies. 	UN development program with comprehensive list of biodiversity-enhancing financing solutions

Regenerative agriculture

To show how finance can positively contribute to biodiversity, this chapter presents regenerative agriculture as an example of one way in which biodiversity can be restored and conserved. We outline the importance of agriculture and its impact on biodiversity and explain how regenerative agriculture can help address the negative impacts of intensive farming. Insights from interviews and two case studies serve as inputs for our framework which shows how private sector financing can be directed towards biodiversity-enhancing initiatives such as regenerative agriculture.

Agriculture: a primary driver of biodiversity loss

Farmland makes up approximately half of the earth's ice-free land (McCue & Durkin, 2021). It is also one of the primary drivers of biodiversity loss (IPBES, 2019):

- Nearly 75% of freshwater resources are devoted to crop or livestock production
- The value of agricultural crop production has increased by about 300% since 1970 (raw timber harvest has risen by 45% and approximately 60 billion tons of renewable and non-renewable resources are now extracted globally every year – having nearly doubled since 1980)
- Land degradation has reduced the productivity of 23% of the global land surface (up to US\$ 577 billion in annual global crops are at risk from pollinator loss and 100-300 million people are at increased risk of floods and hurricanes because of loss of coastal habitats and protection)

The problem with intensive farming

Currently, intensive farming dominates the Western agricultural sector where only 2-5% of food sales are labelled as organic or biological (Harvey, 2019). Modern agriculture has a focus on production, is extractive of nature and is characterised by 'industrial scale, relying on fossil fuel inputs, multinational companies, and artificial fertilisers, pesticides and herbicides to grow output' (Gordon et al., 2021). Most modern forms of agriculture are in one or more ways 'intensive'. This is problematic because intensive farming is responsible for 30% of all greenhouse gases and erodes 24 billion tons of topsoil every year which, if continued, could mean that we only have 60 harvests left before our ecosystems can no longer recover from human activity (EIT Food, 2021).

Intensive agriculture also leads to biodiversity loss, primarily through the excessive use of synthetic nitrogen fertilizer. Through its impact on air, water, and soil quality, intensive agriculture can lead to vegetation and ecosystem changes, eutrophication of waterways, and ultimately stratospheric ozone depletion and climate change (Erisman et al., 2015). The destruction of the natural environment threatens food availability as degraded land can no longer provide sufficient yields (Ferwerda & Schoenmaker, 2020). At the same, a growing population places increasing pressure on agricultural productivity (Harvey, 2019).

The expansion of agricultural land is also a major driver of deforestation which not only destroys natural ecosystems, but also decimates people's habitats (WWF, 2022). In addition, subsidies for intensive agriculture encourage overproduction which drives down global food prices and jeopardizes farmers' income. Since farming is seen as the only viable livelihood option for approximately three-quarters of the world's extremely poor people, these social impacts disproportionately affect the poorest people, thereby further exacerbating global inequalities and increasing poverty (WWF, 2022).

Financial risks associated with intensive farming

Besides these risks to nature and society, with which the economy is inherently intertwined and therefore indirectly threatened by, intensive agriculture also poses direct financial risks (Dasgupta, 2021; NGFS, 2022). The scarcity of agricultural land drives up land prices and requires farmers to intensify their agricultural activities in

the short-term in order to cover these higher costs (Dimal, 2019). An example that illustrates the financial consequences of intensive agriculture is the Dutch nitrogen crisis which put over 18,000 infrastructure and construction projects on hold and limited agricultural expansions with an estimated economic loss exceeding €14 billion (Erisman, 2021). Many of the current problems we face in agriculture, are the result of one-sided agriculture based on increasing yields and production (Harvey, 2019).

Furthermore, policy mostly has short-term aims and misses an underlying landscape (valuation) model, i.e., the integration of the long-term value of landscapes and the needed interventions to restore depleted land (Ferwerda & Schoenmaker, 2020). As such it neglects the long-term production and environmental risks associated with agriculture (Ferwerda & Schoenmaker, 2020). In that sense, intensive practices pose a long-term risk on environmental, social, and financial value (public and private).

Regenerative forms of agriculture

One way to transform farmlands into biodiversity-enhancing areas is through regenerative land management systems in agriculture. Regenerative agriculture can be defined as a principle in which food is grown in a way that it returns and restores nutrients and life in the soil rather than purely extracting them and stripping the earth (McCue & Durkin, 2021). Regenerative agriculture offers a way of farming that generates financial, ecological, as well as social returns in a regenerative way. As such, it steers away from a narrow scope of production yields and focuses more on enabling long-term sustainable production. Regenerative agriculture restores the natural rhythm of our ecosystems, allowing us to improve the quality of crops, protect the soil to ensure long-term yields, and safeguard farmers' livelihoods (EIT Food, 2022).

By embracing techniques such as zero tillage, protecting the soil with cover crops or crop residues, planting a variety of different crops, and periodically rotating them, one can naturally control weeds, pests, and diseases and thereby avoid soil erosion and proof against droughts. In addition, regenerative agricultural practices result in more reliable yields and do not require as much farm machinery, reducing fuel consumption and labour (Dent & Boincean, 2021). However, the main disadvantages to regenerative farming are the need for farmers to acquire new knowledge and skills, the increased use of herbicides to combat unwelcome plants which may result from not tilling, potentially lower yields (reduced profit margins) and higher costs, the dependency on local climate and crop conditions, and the costs and time needed to transition from conventional to regenerative farming (EIT Food, 2020). Furthermore, there are less subsidies available for regenerative farmers, it brings about marketing challenges, and there can be certification pressure (Crop for Life, 2021).

There is still considerable ambiguity regarding the concept of regenerative agriculture as there is no uniform scientific definition. Some describe regenerative agriculture as a technique that uses organic farming methods, while others understand the concept as an approach that has the capacity to self-sustain and aims to increase the soil's health and resilience (Schreefel et al., 2020). The main difference is the entry point to regenerative agriculture which focuses either on the operations at farm-level, like minimal tillage or crop rotation, or more holistically on the system-level objective of an approach, like reducing environmental externalities (Schreefel et al., 2020).

Necessary transitions in the agricultural sector

The agricultural sector needs to be transformed. This is first and foremost a public issue which requires support from the government, primarily in the form of tax incentives and subsidies (Van der Meulen, Van der Meer & Van Asseldonk, 2020). Public support is necessary to enable farmers to transition to sustainable forms of agriculture as governments can provide long-term policies which are consistent with the principles of nature-inclusive

farming (Van der Meulen, Van der Meer & Van Asseldonk, 2020). However, to scale the transition, the financial sector must also play a role. More specifically, financial institutions can help reform the agricultural sector by making it easier for nature-inclusive farmers to find financing (Bouma, Koetse & Brandsma, 2020).

An often-heard counter argument to nature-inclusive farming is that sustainable agriculture would not be able to provide enough food to feed the global population. However, as the United Nations Food and Agriculture Organization points out, approximately 30% of global food production is either lost or wasted – an amount that represents enough food to feed 2 billion people (UNFAO, 2014). This shows that the current food problem is not so much an issue of scale and volume, but rather a problem of correct distribution. In addition, switching to plant-based diets would further help to drastically reduce the amount of land needed to grow food (Sun et al., 2022). While 80% of agricultural land is currently used for grazing and animal feed, reducing the consumption of animal-based foods would free up vast amounts of land that could be used for regenerative farming (Sun et al., 2022).

Transition challenges

The transition to regenerative, more nature-inclusive forms of agriculture is challenging for several reasons. First, nature-based solutions, to restore and conserve biodiversity, must be implemented in agricultural landscapes, however, they primarily benefit society at large rather than the individual farmers. This makes it difficult to implement since landowners face high demands to transition to more sustainable farming practices, but at the same time they do not receive the necessary support or financial incentives to undertake these transformations (Prowater Platform, 2021).

This has become increasingly clear with recent farmer protests in the Netherlands which have criticised the government's new environmental regulations for the agricultural sector to limit nitrogen pollution. To cut down on emissions, these restrictions risked endangering many agricultural practices without offering compensation, potentially threatening farmers' livelihoods (Schaart, 2019). The results of a PBL-study in The Netherlands show, however, that farmers are willing to increase their efforts in sustainability if sufficient financial incentives are in play (Bouma, Koetse & Brandsma, 2020).

Second, the benefits of sustainable agriculture only become evident in the future. It therefore requires a longer time horizon which results in transition costs (Ferwerda & Schoenmaker, 2020). In the Netherlands, the capital position of agricultural organisations has grown steadily over the past years. In ground-based sectors, farmland accounts for the biggest part of the capital position. On average among all these sectors, 70% of the capital position is equity. Debt is backed by bank loans for 90%. Agricultural activities typically provide low return on equity. As such, they are not very attractive to other parties than banks.

Possible alternative financing forms for agricultural loans are leases, crowdfunding, and private investors. These financing forms can be bundled (blended finance) as interest for agriculture among other financiers is slowly increasing. Partly due to the current Basel III and upcoming Basel IV guidelines, banks are increasingly strict when it comes to agricultural loans. It might mean that under the Basel IV guidelines banks must hold more capital for loans with a relatively "low" risk profile, such as agricultural loans which often have a lot of land as collateral. Holding more capital for these types of loans could mean therefore that banks may have less appetite for such financing.

Even more than in the past, banks look at profitability and liquidity, rather than long-term value and collateral. In agricultural business, profitability and liquidity are inherently volatile. For innovative farming solutions, without a

historical track record of profitability and liquidity, this is even more true. Consequently, they are often seen by banks as too risky. This underscores how important it is to consider good and fair returns for farmers, i.e., their earning capacity. Subsequently, it underscores the importance of having supportive, long-term oriented policies in place (Van der Meulen, Van der Meer & Van Asseldonk, 2020).

Third, transitioning from conventional to regenerative farming practices requires a shift in mindset since any change from the status quo is typically perceived as a threat at first. This means that, despite the evident long-term benefits, it is difficult to convince farmers to change their ways of working (Yue et al., 2020). A survey from PBL shows that the motivation of farmers plays a big role: those that are already motivated for sustainability are more likely to take on the risks that come with converting their business (Bouma, Koetse & Brandsma, 2020).

How finance can help the agricultural transition

Through its lending and investing practices, the financial sector has the power to allocate financial resources to projects. By directing these funds to biodiversity-enhancing agricultural initiatives, rather than projects that lead to further environmental degradation, financial institutions can positively contribute to the agricultural transition. In this way, the financial sector can actively shape biodiversity conservation and restoration. There are several examples of organisations that already finance regenerative agriculture such as the AGRI3 Fund by Rabobank, FMO, the Dutch ministry of foreign affairs, and others.

This fund aims to mobilise additional public and private capital at scale to contribute to sustainable agricultural value chains and avert deforestation. Kempen's SDG farmland fund is a new investment solution to offer institutional investors global access to farmland as an asset class while also contributing to the achievement of the UN Sustainable Development Goals. Another example is the Investment of Rabobank and NWB Bank in the Klimaatfonds voor de landbouw (as part of Groenfonds) which focuses on reaching targets of the Ministry of LNV regarding the transition to sustainable agriculture and preservation of biodiversity. Further initiatives that financial institutions can take to address regenerative agriculture and accelerate the flow of capital towards nature-inclusive farming are explored in the next chapters.

3 Insights from interviews

After the literature review on biodiversity finance and regenerative agriculture, several interviews with members of the Sustainable Finance Platform's working group and other biodiversity or agricultural experts from financial institutions were conducted. The purpose of the interviews is to gain a deeper understanding on the role that biodiversity and regenerative agriculture currently play within financial institutions. It was explored how these topics are integrated into lending and investing practices and what the potential barriers for implementation are. This section outlines the main insights we gained from the interviews and their conclusions.

Two strategies: risk mitigation or positive impact

Financial institutions follow one of two strategies regarding biodiversity. Either they focus on risk mitigation – reducing biodiversity loss – or they focus on creating positive impact – increasing biodiversity. Currently, most financial institutions focus on mitigating the risks related to biodiversity by basing investment decisions on preventing further biodiversity loss, for instance by excluding projects that cause severe environmental damage. They focus on measuring the impact of operations on nature and raising awareness about sustainability issues amongst stakeholders. On the other hand, strategies aimed at creating positive impact focus on making investments that restore and preserve biodiversity and positively contribute to nature. There is also growing demand for more sustainable solutions from clients and the general public.

As sustainability topics such as biodiversity are gaining traction, interviewees noted that it has become easier to make a case for investments in sustainable initiatives. There seems to be a consensus that business as usual is no longer an option. However, it is challenging to translate intentions into actions and tackle the biodiversity challenge. Often there are not enough guidelines or incentives to support investments in biodiversity, making it difficult for financial institutions to navigate this space. Furthermore, many noted that there is still a lack of 'best practices' and so-called 'model farms' that could be used as examples and inspire others to follow suit.

Conceptual unclarity

Another aspect is the conceptual unclarity surrounding the concept of regenerative agriculture. Interestingly, current ways of working are rarely questioned on their conceptual clarity because they are simply accepted as the status quo, while transitioning to sustainable alternatives often must be clarified and made very specific. There are numerous definitions for regenerative agriculture ranging from specific types of operations that are regenerative to a systemic approach to farming with the objective of enhancing the natural environment. However, in the end, it is not important how an initiative is labelled or defined but rather how it contributes to biodiversity restoration. Therefore, to overcome the "buzz" surrounding regenerative agriculture as a concept, it is important to uncover the meaning behind the different biodiversity claims and to focus on the impact rather than the label.

Scalability

Another obstacle for financing regenerative agriculture is scalability. While there are many positive examples of individual farms implementing regenerative agriculture principles, most of these projects are still too small to be financeable for financial institutions. This poses a problem because most regenerative agriculture initiatives are significantly smaller than the minimum threshold needed to qualify for an investment or a loan.

However, increasing the size of the farm, or investing only in large farms, may not be the answer because scaling agricultural operations requires not only more financing, but it also increases environmental risks which lead to higher risk premiums on interest rates (Ferwerda & Schoenmaker, 2020). To cover this risk, operations would need to become more intensive in order to return higher yields. However, as operations are scaled with the aim of becoming financeable, not only their absolute impact, but also their relative impact on nature worsens,

resulting in a vicious cycle. This suggests that there is an apparent, paradoxical trade-off between advocating for small-scale, regenerative farms which can help to restore and regenerate biodiversity, on one hand, and the need to increase the size of these farms in order to make them financeable for financial institutions, on the other hand.

Perception of risk and uncertainty

The perceived risk and uncertainty surrounding regenerative agriculture projects is another hurdle that many interviewees mentioned. On one hand, climate change results in more frequent and more severe weather changes which directly impact all farming practices and yields and increase the climatic uncertainty for farmers, including regenerative farms. On the other hand, farmers experience a lot of regulatory uncertainty because governmental policies and regulations on biodiversity and agriculture appear to be in a constant state of flux, making it difficult to anticipate whether or not it will be favourable or even mandatory to switch from conventional to regenerative forms of agriculture. At times, regulations even appear to be contradictory, for instance regarding the use of fertilizer and the application of organic fertilizer.

Together, this makes it very difficult to plan because risk and uncertainty are perceived to be high. Adding to this is the long time-horizon of sustainable farming. The financial system is structured in such a way that it favours quick returns on investments, while most sustainability-related projects only payoff in the long-term. To overcome this challenge, there is a strong case to be made for public-private partnerships between governmental bodies and financial institutions. While public entities can bear greater risks and their investment in a project would provide assurance and security, private entities have greater financial means to scale the impact. A partnership like this could thus be an effective way for finance to positively contribute to biodiversity restoration and conservation through regenerative agriculture.

Position of financial institutions in the value chain

The position of financial institutions in the value chain also plays a role when it comes to financing regenerative agriculture. Some interviewees noted that it is often difficult to have a direct positive impact on biodiversity if the investment portfolio does not include farmers themselves but rather companies which in turn contract farmers. Thus, biodiversity outcomes sometimes feel very distant from the financing structures which might give the impression that it is difficult to influence the environmental impact of multi-tiered investment portfolios. However, it should be noted that there is a responsibility to ensure that sustainability criteria extend beyond the direct clients and include higher-tier suppliers.

Focusing on managing relationships with suppliers and other partners can help create feasible performance indicators that align the incentives of both financiers and the recipients of the financing at farm-level. Others also noted that they do not have insights into the exact land they finance and therefore also do not know how their financing and investing decisions impact the soil and biodiversity in those areas. Regarding the quantification of the impact of financing and investing decision, there are an increasing number of measurement tools that can help quantify environmental impacts. For instance, the Open Soil Index (OSI) is an open-sourced soil assessment framework that provides soil quality and management scores for individual agricultural fields and suggests ways for improvement (Ros & Fujita, 2020).

Geospatial differences

Another obstacle are geographical differences. Not only do the climate and soil quality differ greatly between regions, but also people's willingness to transition towards biodiversity-enhancing initiatives varies. In nature protection areas where biodiversity levels are already relatively good, it is easier to implement biodiversity positive measures such as regenerative agriculture than in other areas where a lot of nature and species have

been lost. One reason for this could be that people are less sceptical towards regenerative agriculture when they have experienced the benefits of restoring and conserving biodiversity. It could also seem like a smaller commitment with a greater payoff to invest into nature-enhancing projects when a certain basis has already been established and one does not have to start completely from scratch.

Intertwined societal challenges

At a systemic level, interviewees noted that tackling the agriculture challenge is particularly difficult because the many challenges that the Netherlands faces (housing, mobility, water, nitrogen, energy, climate, biodiversity, etc.) are particularly emphasised for farming in the countryside. There are tensions between new farming initiatives, regional, national, and European governments, and the private market, including suppliers, food processors, retailers, financiers, and banks. All of this makes it difficult to transition. Some barriers must be resolved at the national or international level. However, it is not possible to find a universal solution everywhere which calls for an area-oriented, nature-inclusive approach and regional proposals.

4 Insights from cases

Three case studies are highlighted in this chapter to show how nature-inclusive agricultural practices are currently financed/ subsidized. This section takes a closer look at two fundamental issues that need to be overcome in order to realise the transition to sustainable, nature-inclusive agriculture: high land prices for farmland and the lack of fair returns for farmers. The cases illustrate how two organisations are currently addressing these issues. They serve as a basis for developing a framework to inspire other players in the financial sector to join the transition.

1.1 Insights from case 1: BD Grondbeheer

BD Grondbeheer is an independent foundation that purchases agricultural land and promotes biodynamic farming to ensure healthy food and a vibrant earth for current and future generations.

About BD Grondbeheer

BD Grondbeheer is a foundation that buys agricultural land and leases it to biodynamic farmers at a fair price without a profit motive (Stichting Grondbeheer, n.d.). BD Grondbeheer was founded in 1978 on the basis that agricultural land should not be treated as a commodity that could simply be sold to the highest bidder. Due to the fungibility of land (i.e., areas used for agricultural practices can also be used for other purposes that potentially result in higher financial returns), it is difficult for retiring farmers to sell their farms to a new generation of farmers since they cannot afford the high land prices. BD Grondbeheer addresses this problem by acquiring agricultural land through donations and so-called perpetual bonds and ensuring that the land can never be sold or borrowed again. The bonds offer an interest rate of 1.5%, indexable every five years up to a maximum of 4%.

The bonds are indefinite, meaning that they cannot be redeemed. This combination of donations and low-interest bonds allows BD Grondbeheer to lease the land to farmers for a low price and enables farmers to cultivate it for a long time. To promote the switch to nature-inclusive, circular, and organic farming methods, BD Grondbeheer leases its agricultural land to biodynamic farmers and horticulturists. Sustainable soil management in the form of regenerative agriculture thus offers a way to increase the financial value of land by maximally utilizing it in a sustainable way, enhancing soil quality and improving crop production (Kik et al., 2021). The philosophy behind this, is that land should be free from the market, meaning land should not be a collateral.

The current speculative element in land prices, should be brought back to its nature and subsequent production properties. The capital burden on the land should be brought back to zero. However, it does not mean that farmers should pay zero for the land. Although the land price is still high (the circumstances cannot be changed), the access to land becomes cheaper. Without an obligation to pay back a huge loan, the farmer can pay an affordable lease for the land. A lease that is proportionate to sustainable production, rather than proportionate to a market price. This way, farmers can lower the environmental burden on the land, by lowering their production.

High prices for farmland

In the Netherlands, the average price for farmland is €70,000 per hectare, which is the highest in the EU (Kadaster & Wageningen Economic Research, 2021). An overview of agricultural land prices per country in the EU can be seen in Figure 3. The high land prices make it difficult, if not impossible, for farmers to start a farm (let alone, transition to nature-inclusive farming) because it requires them to take out high loans. To ensure that they can repay these loans, farmers are forced into intensive agriculture to generate high revenues in the short-term.

The intensive agricultural practices densify the soil, deplete it over time with negative effects on biodiversity, soil quality, social welfare, and agricultural returns in the long-term. As such, materially the soil depreciates faster than it does financially, resulting in a financial value for the land that is detached from the real material value of

farmland, the farming practices and soil quality of the land (Dimal, 2019). To circumvent this, the financial and ecological value of land should be interconnected. Agricultural practices should supplement the value of the land as it depreciates financially. One way to achieve this is through a fair price for farmland which considers both the private as well as the common value of land. An example of this is France where there are laws in place that regulate the access to and prices of farmland to ensure that agricultural land is not subject to market prices (Sanglier, Martin & Rioufol, 2017). These regulations have helped reduce agricultural land prices in France to one of the lowest in the EU (Silvis & Voskuilen, 2018). In contrast, Dutch land prices are almost 10 times higher than French.

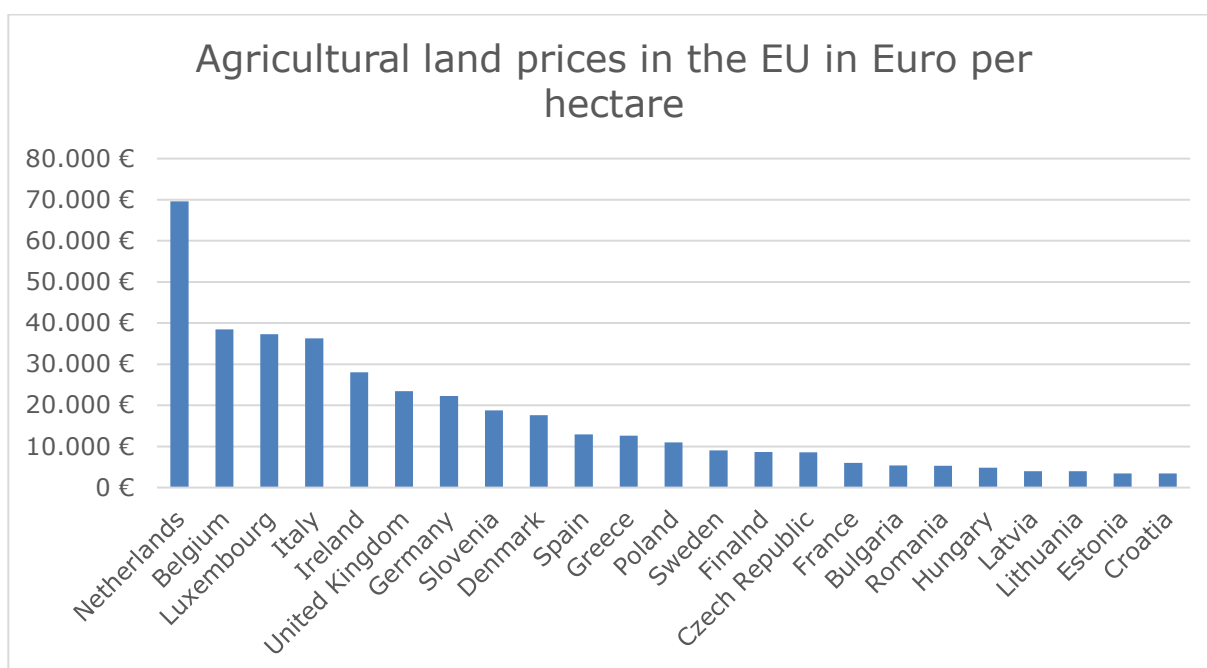


Figure 3: Agricultural land prices retrieved from Eurostat⁵ and the German Statistical Office⁶

Hurdles

Although BD Grondbeheer was already founded in 1978, their activities are innovative. Nonetheless, there are still hurdles to overcome. One of the hurdles is that under Dutch law, the rules for lease (pachten) are quite strict. It is difficult to link (sustainability) criteria to the lease. Lease hold is one of the few forms that allows leasers to lease land based on preconditions.

The main issue, however, is that the current practices of BD Grondbeheer are not easy to be scaled up. They depend mostly on donations. Although the concept of BD Grondbeheer could potentially be interesting for institutional parties with a long-term investment horizon, current margins (1.5%) are too low to be an attractive option.

This is different in other countries: in France, for example, pension funds are obliged to invest a minimum percentage of their funds in social bonds, which includes organic agricultural land. Such developments would be welcome in the Netherlands as well since donations alone will not suffice to scale up. Next to the need for more

⁵ <https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>

⁶ https://www.destatis.de/EN/Home/_node.html

institutional investors (e.g., pension funds), the government should also get involved. If the government can step in and guarantee approximately 1/3 of the land prices, then the risk is decreased for other types of investors, incentivizing more private money to flow to long-term regenerative agriculture initiatives. Therefore, there is a strong case for shared ownership with the government. Finally, to scale up financially, there is also a need for new innovative financing products.

1.2 Insights from case 2: Eco Burgerboerderij De Patrijs

This section outlines the case of Eco Burgerboerderij De Patrijs, a farm-to-consumer initiative that delivers local, ecological, healthy products via a membership model. Currently, De Patrijs is in the process of buying a traditional farm and converting it to a nature-inclusive farm.

About Eco Burgerboerderij De Patrijs

De Patrijs works towards creating a mixed, ecological, nature-inclusive farm that produces healthy products. Their vision is to take over a conventional dairy farm and transform it into a nature-inclusive farm to show how agriculture can be a catalyst for biodiversity conservation rather than deplete nature.

Business model

The business model of De Patrijs is based on a direct link from farmer to consumer: milk is bought from a local farmer, De Patrijs produces cheese from this in their own mobile cheese factory and sell it in one of their four local stores together with other fresh produce. Consumers can subscribe to De Patrijs' membership of €5 per year which gives them access to the four local stores, open 7 days a week. There are no personnel working in these stores. Rather, the stores operate on a trust basis. Consumers with a membership have access to an app that opens the store doors and customers are free to pick whatever products they like and register them in an app.

The price of their purchase is then deducted automatically from their account monthly. While in search for a suitable farm to produce its own raw materials, De Patrijs currently purchases fruits and vegetables and milk for cheese production from local, sustainable farmers and re-sells them in the four stores. In the future, the plan is to produce all the food and raw materials on a dedicated De Patrijs farm. De Patrijs's unique selling point is delivering products with a story and making fresh, local, healthy food accessible to those who want to support a sustainable lifestyle.

Financing

De Patrijs had planned to buy a dairy farm from one of the founder's relatives and make it more sustainable, resilient, and multifunctional by reducing the number of dairy cows from 160 to 70, introducing other animals, and growing fruits and vegetables which they could sell to customers locally. To realise this, they needed bank funding of €4 million. However, the bank concluded that with fewer cows (i.e., less dairy) on the farm, the business would not be profitable enough to allow De Patrijs to pay back the loan.

De Patrijs was only eligible for a loan of €900,000. However, after expanding the business case to include four local stores and proving they were more than capable of producing cheese and selling the products through these stores they were eventually able to secure a €1,8 million loan of the bank. The loan still only covers €900,000 for the farm, but now also includes another €900,000 for retail activities (i.e., the four stores). However, to realise its vision, De Patrijs also had to look for other forms of finance, i.e., blended finance. Besides their personal saving of €500,000, the founders started a crowdfunding campaign which allowed them to raise an additional €600,000. People could purchase certificates of €1,000 at an interest rate of 1.5 % which would be paid once the

farm was profitable. The blended finance, combined with a remaining €1.1 million were contributed by Natuurmonumenten and Fonds Natuurinclusieve Streekboerderijen as well as a private investor.

Category	Amount	Percentage
Agricultural bank loan	0,9 m	22,5%
Retail bank loan	0,9 m	22,5%
Personal savings	0,5 m	12,5%
Crowdfunding campaign	0,6 m	15%
Funds and private investors	1,1 m	27,5%
Total	4 m	100%

Ownership structure

Another characteristic aspect of De Patrijs is its ownership structure. For De Patrijs the legal structure should support the key principles of the organisation: the organisation owns itself, collaboration should be made possible on a basis of equality and self-management, farmers should be able to join and leave the organisation without having to deal with matters of finance (capital), and the farm should be available for future generations. In the eyes of De Patrijs, the organisation has three forms of ownership: the entrepreneurs, the community, and the property (Eco Burgerboerderij De Patrijs, n.d.). It leads to a legal structure with three entities:

1. A foundation. This is the ultimate owner, director, and sole shareholder with the right to profit of the BV. The farmers within the organisation take seat in an advisory board, from which a board is drawn (based on drawing lots).
2. A BV. The BV holds the ownership of the land, yard, and buildings. The neighbourhood cooperative and the Management BV of the founder have non-profit shares in the BV.
3. Partnership firm (VOF). The BV and all farmers participate in the partnership firm. It offers a partnership firm contract that stipulates the hourly rate farmers receive for their work and other conditions (like room and board). It furthermore states that no capital is built up by the farmers in this construct (Eco Burgerboerderij De Patrijs, n.d.).

Unique about this ownership structure is that it can be multiplied many times to create multiple local organisations where no party is favoured over another. This way, all guiding principles are safeguarded by a legal structure that facilitates partnerships and enables the owners to profit without exploiting the land or the farmers. See Figure 4.

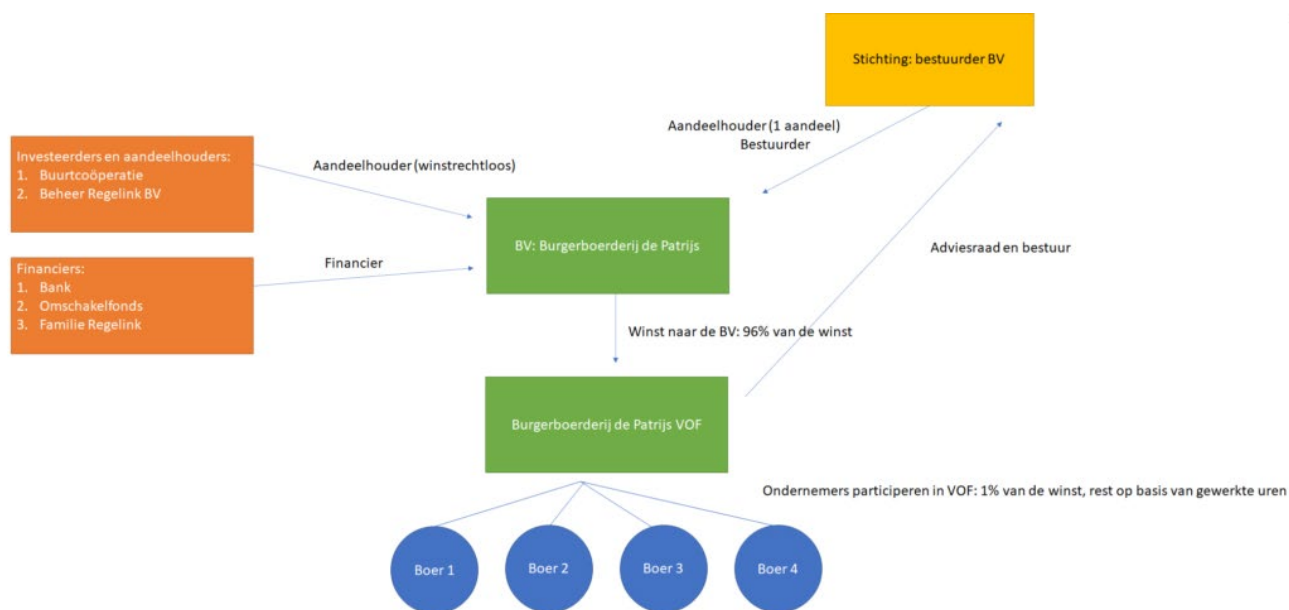


Figure 4 Ownership structure retrieved from Eco Burgerboerderij De Patrijs⁷

Success factors and hurdles

Critical success factors for De Patrijs are:

- Carbon sequestration in the soil
- Input/ output nitrogen ratio
- Soil and water quality
- Carbon footprint
- Biodiversity

Managing these aspects allows De Patrijs to transition towards a nature-inclusive farm. One of the biggest challenges is that the business model of selling products directly to customers is very new and does not fit the conventional financial structures. There is for example not much historical data available about its feasibility. It results in uncertainty for financiers who do not know what to expect from it.

Another challenge is the competition to buy a farm. There are few farmers willing to sell their land. At the same time, there are many people and organizations that want to buy land. This drives up the land prices, making it even more difficult to secure enough financing to take over a farm. Lastly, the ownership structure represents a challenge because it makes it difficult to sell to the next generation. A single owner demands a high sales price and even if it were gifted, a high tax would have to be paid. The biggest issue identified however, is the lack of a true price for food.

A true price for food

As innovative as De Patrijs' concept might seem, on paper there is currently still no price incentive to buy organic food rather than food from an intensive farm. This is harmful because the negative environmental and social externalities of products from the intensive industry are not counted into the price of traditional product. As such,

⁷ <https://depatrijs.eco/over-ons/juridische-structuur/>

organic food is not easily appreciated over traditional food (Hendriks et al, 2021). In the Dutch food-agri sector, there is a need to implement a standard to internalise the external (i.e., environmental, and social) costs of products, thus allowing for a better representation of the price of food (Galgani et al, 2021). The current price premium on organic products is not always affordable for all consumers.

Organisations like De Patrijs must compete with the much cheaper products from the intensive industry that don't count in the external costs. Therefore, nature-inclusive farms like De Patrijs, depend on the niche of consumers that are *willing* to pay the extra price for these products. Additionally, the lack of price differentiation between unsustainable and sustainable farm products, puts nature-inclusive organisations like De Patrijs in a difficult position with banks. Without a prospective sales market for organic products, the business model seems risky.

1.3 Insights from case 3: System's transition to sustainable agriculture

The agricultural system is a global system, that will not be 'solved' by simply solving the costs-return question. It starts with the recognition that the current margins in the food system are simply unsustainable. A transition to sustainable agriculture means that land is available at fair prices and farmers can generate fair returns from their farming activities.

When the costs of maintaining environmental services are reflected in the price for food, farmers can be mobilised to alleviate ecosystems. It is "because the cost of food is not reflected in the price of food, it is impossible to introduce best, as opposed to second-best or worse, solutions to the problems of allocating and managing land and water" (Allan & Dent, 2021). Additionally, it is unlikely that this problem is solved by one fix but rather by multiple fixes and/or multiple parties working together. It asks for addressing the power relations across the food system. Dealing with the affordability of food asks a great deal of courage from governments.

The challenge

The Dutch nitrogen crisis illustrates the need for a systemic transformation in the agri-food system. Agriculture is one of the biggest emitters of reactive nitrogen due to the excessive use of synthetic fertilisers. This results in nitrogen pollution which is a major driver of biodiversity loss and climate change since a surplus of reactive nitrogen leads to air and water pollution, soil acidification, and the domination of few, nitrogen-tolerant plant species, threatening the resilience of important earth systems (Rockström et al., 2009). As the second largest agricultural exporter in the world (Erisman, 2021), more than half of the Netherlands' surface area is used for agriculture, making the agricultural sector responsible for 46% of all nitrogen emissions (Berkhout et al., 2019).

To address the nitrogen problem, the Dutch government introduced the Programmatic Approach on Nitrogen (PAS) in 2015. However, this scheme simply allowed businesses to continue to emit nitrogen so long as they promised emission reductions in the future. In 2018, the Council of the Netherlands therefore ruled that the PAS breached EU law for failing to ensure sufficient nitrogen reductions. This put a sudden ban on all nitrogen-emitting operations and led the country into a nitrogen crisis which resulted in widespread economic and social consequences, putting over 18,000 infrastructure and construction projects on hold, and limiting agricultural expansions with an estimated economic loss exceeding €14 billion (Erisman, 2021).

In 2020, the Dutch government announced new measures to tackle the nitrogen crisis: a €350 million buy-out scheme for livestock farmers (Rijksoverheid, n.d.). Closing intensive nitrogen-emitting farms by buying out farmers is meant to help drastically reduce nitrogen emissions (Kotkamp, 2021). However, these measures have received widespread criticism for being short-term oriented and threatening the collapse of the food system.

Farmers feel that they are not being supported to transition to less nitrogen-intensive farming and simply forced to quit. The government's current approach to the nitrogen crisis thus appears one-sided. Rather than buying out livestock farmers who emit high levels of nitrogen, it would be more effective to support them financially in transitioning their agricultural operations towards nature-inclusive farming which would help reduce nitrogen deposition, restore biodiversity, and ensure a sustainable food system.

A solution to fix this system's challenge are decentralized landscape approaches. They attempt to solve the challenges on a local scale involving multiple stakeholders. Initiatives like this have been arising in abundance in the Netherlands examples are the Transitie Ronde, Commonland & overleg omgaan fysieke leefomgeving, and groen/blauwe dooradering. These are collective actions from all sectors – civil society, government, and businesses – which are needed to move to nature-based agriculture. However, these initiatives appear to be moving step by step and relatively slow due to their multiple stakeholder approach. From the Delta Plan for Biodiversity Restoration, the following success factors emerge as prerequisites for achieving a transition towards nature-inclusive agriculture: regenerative farming (Samen voor Biodiversiteit, n.d.):

- Support and shared values: currently, bank favour intensive large-scale farming over extensive, small-scale farming. Bank's automated processes are based on the current risk-return models, which are not suitable for nature-inclusive farmers. To have an account manager really dig deeper into the business case of the farm, the loan needs to be substantial (approximately from EUR 1 million onwards).
- Revenue models: consumption patterns make it difficult, as the margins for products are very low (this is elaborated on in Case 2).
- Area-focused approaches
- Knowledge and education: most farmers were taught that scaling up is the only way forward.
- Coherent legislation and regulation: the current lack of policy consistency also adds to the perceived uncertainty and risk of financial institutions.
- Monitoring

To help initiatives like this, scale it is not even necessary. Rather than execution at the country level, it is more important that appropriate resources are made available to help these initiatives scale and succeed on a local level. A decentralized approach makes customization possible with an eye for the farmers involved, who have often worked on and on their farm for generations. The transformation can be designed in contiguous areas, for which The Netherlands has extensive experience: land consolidation (Schoenmaker & Bosma, 2022).

Transition paths

The current approach towards the nitrogen problem is mainly aimed at the linear reduction of nitrogen emissions. It does not offer a long-term perspective for the future of our farmers and the agricultural sector, which calls for a transition from intensive to extensive livestock farming and a better understanding of the value of land. There is a need to develop a framework based on three principles: a new view on agriculture and land value, a good revenue model for farmers and a fair transition to which all stakeholders contribute.

The European perspective

The EU has formed a European Green Deal, which aims to solve some of these systems challenges. The most important policy changes are formulated within the EU's farm to fork strategy, the EU biodiversity strategy as well as the EU green taxonomy. The latter gives a definition of what sustainable agriculture entails, and aims to steer financing to more sustainable investments. The farm to fork strategy set a target to boost organic production to reach 25% of the EU's agricultural land use by 2030 (European Council, 2022), in the Netherlands currently around 4% of the agricultural land is organic ([Compendium voor de leefomgeving](#), 2022). Lastly, the EU

biodiversity strategy speaks about investment, pricing and taxation it speaks explicitly about public/private blended finance to unlock more potential for financing biodiversity as well as promoting tax systems and pricing that reflect environmental costs (European Commission, 2020).

5 A framework for regenerative agriculture

The cases of BD Grondbeheer and Eco Burgerboerderij De Patrijs show that regenerative agriculture currently does not match the traditional risk-return paradigm of financiers. BD Grondbeheer shows that there is a misalignment between financial and ecological interests – especially in The Netherlands, the land scarcity drives up agricultural land prices which pushes farmers to intensify their agricultural operations. There is simply not a **fair price** for agricultural land.

By buying land and leasing it back to sustainable farmers for a fair price, BD Grondbeheer allows farmers to implement sustainable, regenerative farming techniques. As such, it decouples market prices from the land, thus enabling a transition to regenerative, nature-inclusive agriculture. BD Grondbeheer offers a so-called indefinite bond which assures a long-term sustainable land management perspective. The scalability of the concept, the margins on the bond and the Dutch context of regulation and laws are still hurdles.

The case of Eco BurgerBoerderij De Patrijs shows how innovative ways of farming can help to reduce the nitrogen ratio, increase the soil and water quality and sequester carbon in the soil. The food-to-consumer business model allows for a shorter value chain – an important part of the agricultural transition. However, such business model for does not yet fit the conventional financial structures. It was difficult for De Patrijs to get a bank loan that provides enough capital to start the business. As there is no **true price** for food, De Patrijs experiences too much competition with farms that produce food in a cheap way but at the same time do not manage the land sustainably.

Another challenge is the competition to buy a farm as there are very few farmers who want to sell their land but many people and organizations that want to buy land. This drives up the land prices, making it even more difficult to secure enough financing to take over a farm. Lastly, the ownership structure represents a challenge because it makes it difficult to sell to the next generation. A single owner demands a high sales price and even if it were gifted, a high tax would have to be paid. The cases show that there are challenges on the level of **costs** and on the level of the **returns**. As for the systems case, it shows that there is not a one fix solution and that we should acknowledge that to solve this complex problem we should find a solution that acknowledges this and that forces multiple parties to work together. The building blocks below present an integrated solution of the three cases available on a larger scale.

The building blocks

There is a need to move from an extractive system that pursues short-term profits to a regenerative system which promotes sustainable management in the long-term (Fullerton, 2015). Continuous economic growth based on environmental exploitation is ultimately bound by limited natural resources. This calls for a shift in a regenerative direction. In the case of agriculture, it is worth asking whether we really need to produce greater volumes on more space or whether the land we already have just needs to be used in different ways. Rather than increasing the quantity of production, there is a need to focus on improving the quality of food produced and shifting consumer demands to support this transition. Transitioning from animal- to plant-based diets for instance would help drastically reduce the amount of land needed to feed the global population (personal communication, March 24, 2022).

We conclude that key challenges in transitioning to nature-inclusive agriculture are the issue of **fair costs, fair risk and fair returns**, that are solved by a **system's transition**. These three elements form the building blocks of the framework presented in table 2.

1. **Fair costs:** The current high prices for agricultural land are problematic as they push farmers to intensify their production which harms biodiversity. By using a fund, land prices for nature-inclusive farming can be depreciated from €70,000 to €35,000.
1. **Fair risk and return:** The absence of a true price for products and sustainable land management is also problematic as it is difficult for sustainable farmers to generate sufficient returns. This leads to an improper representation of the true risk and the true returns of nature-inclusive farming. Ideally, banks favour nature-inclusive farms with lower interest rates and develop other financial products that invest in nature-inclusive farming. The government should ensure that a true price for food-agri products naturally incentives towards sustainable products. It is also important that risk models show the fair risk agricultural activities pose, now and in the future, from a systemic, transition and physical risk perspective.
2. **A system's transition:** The government needs to ensure helpful policies and help setting up a financing solution to finance the conversion from conventional to nature-inclusive farms.

Action is needed from all relevant stakeholders.

Table 2. Building blocks for financing regenerative agriculture

Building blocks:	Problem analysis	Primary stakeholder	Solutions
1. Fair costs: Valuation of land	High land prices for farmland (€70,000/ ha) lead to intensification of agricultural practices and depletion of soil and biodiversity	Ministry of Agriculture, Nature and Food Security	Fund for depreciation of nature-inclusive farmland to € 35,000/ ha.
2. Fair risk and fair return: Business model with good returns	<p>Farmers' income based on maximised production (quantity) at too low prices</p> <p>Perception of risk associated with intensive farming is underestimated, lack of true risk</p> <p>Food for untenable low prices, lack of a true price</p>	<p>Farmers</p> <p>Banks</p> <p>Banks/Supervisors</p> <p>Consumers/ Government</p>	<p>Income linked to quality</p> <p>Lower interest rates for sustainably managed farmland and development of innovative financial products.</p> <p>Ensuring a fair view of risk in risk models.</p> <p>Ensure a true price for healthy food</p>
3. System's transition	Big investments needed for conversion of farms	<p>Ministry of Agriculture, Nature and Food Security</p> <p>Banks</p>	A land consolidation fund for nature-inclusive farms (financed by nitrogen fund and banks) ⁸

Below in the concluding remarks more details on how to practically achieve these building blocks are provided.

⁸ This proposal has been written down in a (Dutch) memo by prof. Dirk Schoenmaker and Dieuwertje Bosma

6 Concluding remarks

This report shows that the financial sector and biodiversity are much intertwined. The scope of this report was limited to regenerative agriculture, as one way to conserve and restore biodiversity by using sustainable agricultural practices. Regenerative farmers however, run into several financial hurdles for their business. The financial sector can help to make finance more easily accessible to them. As concluding remarks, we formulate some recommendations.

1. Guarantee access to finance for nature-inclusive farms

Current risk models for agricultural loans do not always include long-term environmental and social risks. Such risks also entail the rapid loss of biodiversity and degradation of soil quality. They are however often not perceived as material enough. That is a blind spot. Nature-inclusive farms are more resilient to those risks. The conversion to nature-inclusive farming, asks for a different understanding of risk and returns.

- Loans should incentivize sustainable rather than intensive agricultural practices. This asks for a new framework for the perception of both risk and opportunity when it comes to agriculture.
- It also asks for a vision on transition pathways. Many farms that are currently employing intensive methods, lack the conversion capital to make the transition to nature-inclusive farming. Financial institutions can help supplying this transition capital.
- Awareness. Training and awareness of project financiers.

2. Use patient capital for farmland

The agricultural transition asks for a long horizon and patient capital. Furthermore, given the low-risk low-return character of agricultural land, organisations with patient capital, like pension funds, governments, and foundations, might be particularly well-suited to play an important role in the transition (Stephens, 2021).

- The quality of farmland is an increasingly important part of securing the future of food. Under a growing population, demand for food and thus a healthy soil, will only increase. By investing in farmland and leasing the land back to farmers for fair price, financial institutions can generate steady returns and enable farmers to execute their business in a nature-friendly way.
- To bundle initiatives and increase the size of the investment, facilitate management, and help reduce the risk, one recommendation could be to initiate nature-inclusive farmland funds. This way, the financing of nature-inclusive farming could be scaled. It could offer an attractive opportunity for financial institutions to finance small-scale regenerative agriculture that would otherwise be too small or too risky to invest in on its own.
- The knowledge on farmland and landscape value, should increase among financial institutions. Farmland has unique characteristics since it (if managed well) could keep on generating raw materials. It is not the same as other collateral-backed assets like real estate. Rather than being part of an existing asset class, land should be a separate asset class which brings about its own expertise.

3. Mobilise private and public finance to convert intensive farmland to nature-inclusive farmland

The agricultural transition calls for greater collaboration between public and private sectors to scale the financing opportunities for sustainable agriculture. Now, there is still a lack of such initiatives. On a governmental level, a change in managing financial incentives is welcomed:

- In The Netherlands, farmland can become building land. As land is already scarce in The Netherlands, this has a speculative effect on the price of farmland. As such, the land price in The Netherlands is coupled with the scarcity of it. Our food system, nature preservation, jobs in the agricultural depend on affordably access to farmland and a guaranteed sustainable care for it. Prohibiting agricultural land to becoming building land, would be one way to protect that. This is already the case in other countries, like France.
- Current agricultural policies are production oriented. There is a need for policies that are nature oriented. Current agricultural subsidies are geared towards production intensification. A policy reform should shift these subsidies towards nature-preservation which would generate an extra revenue stream for nature-inclusive farmers.
- The Dutch government has a big fund available to buy out farmers to tackle the nitrogen crisis. However, it lacks a long-term vision as there is no underlying understanding of the value of land. There is either farmland (with a current high price of EUR 70,000 per Ha), or the land is nature land (with a price of approximately EUR 15,000 per Ha). It lacks differentiation between the *quality* of farmland (i.e., soil quality, etc.). A proposal has been made to initiate an intermediate facility for nature-inclusive farmland of EUR 35,000 per Ha. Rather than buying out farms completely, the government can use the nitrogen fund to help farmers to extensify their business (“ruilverkaveling”). Banks can pitch in by contributing to the nitrogen fund as well (Schoenmaker & Bosma, 2022). This idea was proposed in a memo, attached in [Appendix 3](#). A similar solution was suggested by Rabobank by creating a not for profit fund to help farmers that are not able to move to regenerative farming practices by temporary or partial leasing of the land (Rabobank, 2021).

The loss of biodiversity is still a blind spot for the financial sector. A major contributor is the agricultural sector. Financial institutions, governments, farmers, and consumers all have a responsibility in the transition to a sustainable agricultural sector. This report means to inspire what possibilities there currently are and how future challenges can be dealt with.

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Appendix 1

Overview of current biodiversity finance schemes

Public or private

Payments for Ecosystem Services

One way to finance biodiversity is through payments for ecosystem services (PES). They work by compensating landowners for actions that help to maintain a certain level of environmental quality (De Blas et al., 2017). Schemes can be either result-based and remunerate farmers for achieving the desired environmental outcome or action-based when rewards are tied to specific management practices. Result-based schemes have been shown to be more effective. However, they also pose a higher risk for the farmer since environmental outcomes can be substantially influenced by external factors. Such payment schemes can be financed either publicly or privately (De Blas et al., 2017). One example of a PES is Prowater's nature-based solution that aims to increase downstream water availability during droughts (Prowater Platform, 2021). In regions with a high water exploitation index and many competing demands, farmers are paid to retain water during wet periods and to not irrigate during dry periods. This provides financial incentives and allows private drinking water companies to pay farmers to improve water availability and quality (Prowater Platform, 2021).

BIOFIN Financing Solutions

The Biodiversity Finance Initiative (BIOFIN) offers further insights into different ways to finance biodiversity. BIOFIN is a United Nations Development Programme-managed global programme that works together with governments and the private sector to direct financial resources towards biodiversity and catalyse investments in nature (BIOFIN, 2021a). The initiative created a catalogue with a comprehensive list of over 150 finance solutions which include instruments, tools, and strategies applicable to the field of biodiversity finance (BIOFIN, 2021b). These include for example biodiversity friendly subsidies, biodiversity offsets, carbon markets, and bonus malus systems. Biodiversity friendly subsidies, such as subsidies for organic agriculture, can be government subsidies in the form of tax reliefs or technical support which support organic farms by encouraging organic production or other sustainable agricultural system (BIOFIN, 2021b).

Biodiversity offsets can work like a trading system where measurable conservation outcomes translate into credits which can then be traded based on their ecological value (BIOFIN, 2021b). Similarly, carbon markets enable the trading of emission units with the aim of reducing greenhouse gas emissions. Trading entities can sell their agriculture-based offset credits to others who can use these to offset industrial emissions (BIOFIN, 2021b). Lastly, bonus malus systems are incentive mechanisms that award biodiversity friendly behaviour with bonus payments and punish non-friendly behaviours with malus payments (BIOFIN, 2021b). These can be used for example to encourage landowners to establish protected areas next to existing protected areas by awarding bonuses. These instruments can be used to steer the necessary financing towards protecting and restoring nature.

Sustainability-linked Loans

Sustainability-linked loans are another type of financing structure that is gaining popularity in the field of sustainable finance (ING, n.d.). They create incentives for companies to improve their sustainability performance by linking the interest margin to the improvement of predefined sustainability metrics (Green Finance Portal, n.d.). Such a framework enables lenders to encourage borrowers to improve their sustainability strategy by tying it to financial benefits. It also gives them the opportunity to steer corporate actions by linking the loan to relevant sustainability-related performance indicators that have been shown to make an impact.

Public-non-profit

Wildlife Protection Scheme

An example of a scheme that aims to protect wildlife is the Aanvalsplan Grutto, an initiative by Pieter Winsemius, former chairman of Natuurmonumenten, It Fryske Gea, the Frisian Environmental Federation, and Vogelbescherming Nederland (Vogelbescherming, n.d.). It provides a plan for protecting the Dutch population of black-tailed godwits, which has been declining steadily over the last years. By subsidising farmers for implementing environmentally friendly agricultural policies, the plan aims to stop the loss of these meadow birds. Farmers can choose from different agricultural management measures, such as late-season mowing, using rough manure instead of slurry, or growing pastures rich in herbs (Vogelbescherming, n.d.). However, a recent report found that the plan is not working; even though the subsidy for bird protection by farmers has increased from 4 to 33 million over the last 20 years, the number of breeding pairs of black-tailed godwits decreased from 60,000 to 30,000 (NOS, 2021).

One of the reasons for this is that most farmers opt for nest protection by marking nests on their land so they do not drive over them, rather than adapting their agricultural practices as this requires more restructuring (NOS, 2021). While protecting the nests helps to ensure the survival of young birds, it is not enough to stop the decline in black-tailed godwits because they still cannot find enough food. It would be more effective to focus on keeping the meadows wet through a minimum level of water or by constructing ditches that hold water so that the birds can find more things to eat. The example of the Aanvalsplan Grutto shows that even though it was possible to raise substantial amounts of funds for biodiversity purposes, the financing did not result in the desired effects because the measures it was used for were not effective at stopping the loss of black-tailed godwits. Thus, regardless of the type of financing for biodiversity, it is crucial to consider the consequences of the measures and ensure they have the intended effect.

Public-private

Sustainable Agriculture Investment Fund

The Sustainable Agriculture Investment Fund from Nationaal Groenfonds is an example of a Dutch initiative that provides loans to organisations and companies that are committed to improving the quality of the environment. The fund is part of the Ministry of Agriculture, Nature, and Food Quality and loans out a maximum of €400,000 per company (Nationaal Groenfonds, 2021). Interest payments are very low in the first years to support entrepreneurs on their transition. However, investments must also be co-financed through other sources, such as financing from banks, own money, or crowdfunding, and must result in measurable outcomes, most importantly a reduction in nitrogen emissions (Nationaal Groenfonds, 2021). Some projects are co-financed by Rabobank and NWB Bank and thus combine public and private money. Through these initial public investments, private parties have more incentives to invest in companies that aim to restore biodiversity since a part of the risk is taken on by the public sector.

Natural Capital Financing Facility

Another public-private initiative is the Natural Capital Financing Facility (NCF) which is supported by the European Investment Bank and the European Commission. This initiative seeks to cover initial start-up costs of biodiversity investments in order to incentivise the private sector to unleash larger investments once the sources of risk have been integrated (De Blas et al., 2017). One example of a project that was financed through the NCF

is the SLM Silva Fund which focuses on sustainable forestry in Ireland (European Investment Bank, 2021). The fund aims to transition forests into 'Continuous Cover Forestry' which maintain permanent forest cover and thereby promote biodiversity, soil health, and landscape value. This offers an alternative to single-species clear fell-replant systems. After initial financing from NCFE, the fund is now in its first investment period (European Investment Bank, 2021). Involving public actors is a good way to decrease the risks for private financial institutions and scale the financing that is necessary to create larger impact.

Triodos Regenerative Money Centre

The Triodos Regenerative Money Centre is an example of a blended financing structure that uses both donations and catalytic investments to support initiatives that regenerate society and the planet (Triodos Bank, n.d.). The goal of the centre is to provide financing solutions in areas where traditional banking and investment products cannot, either because of the risks are too high or the returns are too low. Through donations and catalytic investments, Triodos is able to create societal value and generate impact, independent of financial returns (Triodos Bank, n.d.). Such an internally separate entity can allow financial institutions to positively contribute to social and environmental issues, such as biodiversity loss, by decoupling impact from financial returns.

Private-civil society

Aardpeer Sustainable Agriculture Bonds

Another example is Aardpeer which is an initiative that offers anyone bonds issued by Stichting Grondbeheer, an independent land management foundation (Aardpeer, n.d.). The money from the bonds is used to buy agricultural land which is then made available to nature-driven farmers and food initiatives through a fair lease (Aardpeer, n.d.). The goal of Aardpeer is to raise private capital by giving citizens the chance to invest in sustainable activities and buy bonds for land that is used for sustainable agriculture. A potential advantage of this initiative, compared to private financing schemes, is that it also allows very small projects to be financed which might carry more risk since financing comes directly from individuals.

Private

Rabo Carbon Bank

Based on the idea of paying to preserve and enhance nature, another example of a financing structure is the Rabo Carbon Bank which is a program by Rabobank that offers farmers compensation for implementing regenerative agricultural practices that improve their fields' soil quality while capturing carbon from the atmosphere (Baarsma, 2021). Depending on the amount of carbon sequestered, farmers receive carbon credits which they can sell to companies that seek to offset their emissions (Baarsma, 2021). The proceeds from selling these credits enable farmers to transition to regenerative forms of agriculture which, among others, enhances biodiversity. By financially compensating biodiversity-positive actions, financial institutions can create incentives for sustainable solutions.

Kempen SDG Farmland Fund

The Kempen SDG Farmland Fund is an investment solution for institutional investors that seeks to contribute to the UN Sustainable Development Goals (Kempen, n.d.). It aims to invest in farmland and agricultural properties in OECD countries, mostly in North America, Western Europe, and Oceania, to support sustainable and regenerative agriculture practices and achieve attractive long-term returns. The fund was introduced in January 2021 and has grown by 6.1% since then to a current size of €42.64 million (Kempen, n.d.). By working with local agricultural specialists, the fund is able to combine global investments with local impact. This impact is measured

in terms of improvements on predetermined KPIs, such as the use of fertilizer, level of toxins, size of the area reserved for other vegetation, or water usage (Kempen, n.d.). Despite these concrete KPIs, it is sometimes still difficult to measure the impact on biodiversity because not all impacts are observable or measurable. Further, criteria are context-specific and differ greatly from region to region. This means that a specific sustainability plan has to be set up for each asset.

ASN Biodiversity Fund

Lastly, the ASN biodiversity fund is another example of a private financing structure aimed at restoring and protecting biodiversity. The fund gives private investors the opportunity to invest in projects and companies that were previously only accessible to professional investors, such as pension funds and insurers, through a combination of shares in and private loans to companies (ASN, n.d.). In contrast to traditional funds, the ASN biodiversity fund first tests the impact of a potential investment on biodiversity and then assess its financial return. ASN focuses on four sectors that it believes to be important for enhancing biodiversity: sustainable forestry, agroforestry, sustainable seas and fisheries, and ecotourism (ASN, n.d.). In order to increase the positive impact on biodiversity while decreasing the risk, the fund spreads the investment by diversifying within these sectors, companies, and regions. By prioritising biodiversity impact over financial returns, the fund is able to focus on companies that are still relatively small and often innovative. However, this also results in a higher risk for investors, especially during the start-up phase.

Appendix 2

Relationship between biodiversity and climate change

Biodiversity and climate change are interrelated and should be considered in relation to each other. The erosion of biodiversity is exacerbated through climate change, which in turn further fuels the loss of biodiversity. Both are primarily caused by human interference: through (economic) mismanagement we are depleting our earth's ecosystems.

It should be noted that regenerative agriculture on its own will not solve all issues concerning environmental degradation. Although regenerative practices increase soil health and yield numerous climate-related benefits, such as increasing the soil's carbon sequestration ability, they may be limited in mitigating climate change (Ranganathan et al., 2020). However, given the systemic nature of biodiversity loss, many approaches from different angles are needed to find a solution and regenerative agriculture offers one way to tackle the issue.

Due to the complex structure of the natural environment and the intertwined relationship of biodiversity and climate, the restoration and conservation of the biosphere can have positive externalities for the climate as well. Enhancing species diversity and restoring landscapes can provide a critical buffer against global climate change by increasing the earth's resilience (Canning, et al., 2021). On the flip side, drastic changes in climate also speed up the rate at which biodiversity is lost, which in turn further fuels climate change (Van Toor et al., 2020). This interrelatedness represents a reinforcing loop that can become either a vicious cycle or an opportunity for positive impact. Therefore, it is important to consider both the possibilities and potential impacts of climate change mitigation responses and biodiversity benefits in relation to each other, since even short-term benefits for one could have detrimental consequences for the other and in turn cause adverse effects overall (Mant et al., 2014).

Appendix 3

Van intensieve naar natuurinclusieve landbouw

Dirk Schoenmaker en Dieuwertje Bosma maart 2022

Aanleiding en probleem

De melkveehouderij is verantwoordelijk voor een grote ammoniakuitstoot in Nederland, die schadelijk is voor de biodiversiteit in kwetsbare natuurgebieden. Dit geeft risico's voor alle partijen: boeren, banken, de overheid en de samenleving als geheel. Niet alleen tasten we de ecologische integriteit van het land aan, het is en wordt ook steeds lastiger voor boeren om nog een milieuvergunning te krijgen voor hun activiteiten. Ook banken zien daarmee de waarde van hun onderpanden verdampen.⁹

De overheid zet in op de drastische vermindering van stikstofuitstoot in de Nederlandse veeteelt. Wij stellen echter vast dat dit overheidsbeleid vooral gericht is op de lineaire afbouw van stikstofuitstoot. Het biedt geen langetermijnperspectief ten aanzien van de toekomst van onze boeren en de landbouwsector, die vraagt om een overgang van intensieve naar extensieve veeteelt en een beter begrip van de waarde van land. Dit memo ontwikkelt een denkkader met drie uitgangspunten: een nieuwe blik op landbouw en landwaarde, een goed verdienmodel voor boeren en een eerlijke transitie waar alle belanghebbenden aan bijdragen.

Kader voor overgang: landwaardering

In tabel 1 schetsen we een kader voor de financiering van de overgang, waarbij de direct belanghebbenden bij ieder onderdeel zijn aangegeven.

Onderdeel	Probleem	Belanghebbenden	Oplissing
Landwaarde	Hoge waarde landbouwgrond (€60,000 per ha) leidt tot intensive- ring productie met uitputting grond en milieuvervuiling	Overheid	Fonds voor afwaardering natuurinclusieve grond naar €30,000 per ha
Bedrijfsmodel	<ul style="list-style-type: none"> - Inkomsten gekoppeld aan productie tegen een te lage prijs - Risico intensieve landbouw onderschat - Voedsel tegen onhoudbaar lage prijs 	<ul style="list-style-type: none"> - Boeren - Banken - Consumenten 	<ul style="list-style-type: none"> - Inkomsten gekoppeld aan kwaliteit - Lagere rente voor natuurinclusieve landbouw - Eerlijke prijs voor gezond voedsel
Overgang	Grote investeringen voor omvorming landbouwbedrijven	<ul style="list-style-type: none"> - Overheid - Banken 	Fonds voor 'ruilverkaveling' naar natuurinclusieve landbouw

Landwaarde

Nederland kan door een gunstig klimaat en vlak land, maar ook door intensieve bemesting, zeer hoge productie per hectare realiseren, die deels wordt ingezet als veevoer voor het melkvee. Samen met een algehele schaarste aan vierkante meters en navenante speculatieve effecten, vertaalt dit zich naar een zeer hoge prijs van landbouwgrond, meer dan € 60,000 per hectare. Om de pacht of de rente op de banklening voor het land te

⁹ De fosfaatrechten werken al beperkend voor uitbreiding van landbouwbedrijven. Daar is een noodzaak van reductie van stikstof bijgekomen. Boeren lopen het risico dat ze hun milieuvergunning niet kunnen verlengen, waardoor hun bedrijf moet worden stopgezet. De banken beschermen zich tegen wanbetaling door onderpand van land en bedrijfsmiddelen. De waarde van land en bedrijfsmiddelen zal echter ook verminderen als er geen milieuvergunningen zijn.

kunnen blijven betalen, is intensivering van de productie bij veel boerenbedrijven noodzakelijk. Dit leidt tot intensieve veeteelt. De overheid wil de milieuvervuiling van intensieve veeteelt tegengaan en heeft hiervoor een 'stikstoffonds' beschikbaar in het regeerakkoord. Uitkoopregelingen zijn duur omdat deze de volledige waarde van het land en de bedrijfsmiddelen omvatten. Er zijn niet veel tussenvormen voor landwaardering. Ofwel het is landbouwgrond, ofwel het heeft een natuurwaardering, bijvoorbeeld de door Staatsbosbeheer gehanteerde waarde van €15,000 per hectare.

Ons voorstel is een tussenvoorziening toe te voegen voor natuurinclusieve landbouw. De omslag naar natuurinclusieve landbouw vergt ruwweg een halvering van het aantal koeien per hectare. Gebruik makend van het feit dat veel boeren wel willen stoppen, kan een boer die boer wil blijven gedwongen worden zijn bedrijf om te vormen met een verdubbeling van de hoeveelheid land bij gelijkblijvend aantal koeien omdat zijn grond de restrictie krijgt van natuurinclusief landbouwbeheer.¹⁰ Halvering van de landbouwwaarde maakt dat mogelijk: de natuurinclusieve waarde van grond wordt dan €30,000 per hectare. De regionale overheid kan deze 'afwaardering' van grond financieren uit het stikstoffonds. Dit is goedkoper dan volledige uitkoop tegen €60,000 per hectare en overdracht aan natuurbeheerorganisaties om niet. Er kan dan meer land worden omgevormd.

Bedrijfsmodel

Natuurinclusieve landbouw levert niet alleen minder milieuvervuiling op, maar ook een gezondere veestapel (geen gebruik penicilline) en een gezondere bodem (geen gebruik pesticiden en minder bemesting). Als de vraag van de consument naar biologische producten voor een eerlijke nettoprijs stijgt (dat kan desgewenst ook via lagere btw-tarieven), kan de boer zijn verdienmodel in stand houden met lagere productie van gezond voedsel tegen hogere marges. Daarnaast helpt de lagere landwaarde om de grote kostenpost van grond te halveren. Banken verlagen het kredietrisico op hun huidige portefeuille van intensieve landbouw leningen door hun klanten te helpen bij de overgang naar natuurinclusieve landbouw. Banken wanen zich veilig door het onderpand op volledige landbouwwaarde mee te nemen. Bij vervallen van milieuvergunningen is er echter een gerede kans op faillissement van boeren en afwaardering van land en bedrijfsmiddelen. Het lagere risico bij natuurinclusieve landbouw kan de bank vertalen in een lagere rente.

Overgang

De overheid zet in op decentrale uitvoering van het stikstoffonds. De overgang van intensief landgebruik naar natuurinclusief landgebruik is het meest effectief op regioniveau in plaats van dure landelijke regelingen of individuele uitkoop van boeren. De omvorming kan dan in aaneengesloten gebieden worden vormgegeven. Nederland heeft ruime ervaring met een regio-gebonden aanpak: ruilverkaveling. Na de oorlog was de inzet van kleine, inefficiënte boerenbedrijven naar grote bedrijven met rechte akkers en nieuw-getrokken sloten (met groot verlies aan biodiversiteit). Een nieuwe ruilverkaveling op regionaal niveau kan de omvorming van een aantal aangesloten intensieve landbouwbedrijven naar een verminderd aantal extensieve landbouwbedrijven betekenen. Een decentrale aanpak maakt maatwerk mogelijk met oog voor de betrokken boeren die vaak generaties lang op en aan hun boerderij hebben gewerkt. Dergelijke ruilverkaveling en omvorming van de overblijvende landbouwbedrijven vergen investeringen, die vanuit een 'ruilverkavelingsfonds' kunnen worden betaald. De (regionale) overheid en banken hebben belang bij deze ruilverkaveling naar een toekomstbestendig landbouwmodel. De regionale overheid kan bijdragen aan het ruilverkavelingsfonds vanuit het stikstoffonds. De

¹⁰ Dit is een rekenvoorbeeld. De kern is dat bij natuurinclusieve landbouw het aantal koeien per hectare min of meer halveert. De schaal van het bedrijf kan dan variëren van de helft van het aantal koeien bij dezelfde hoeveelheid land tot gelijk aantal koeien bij verdubbeling van het land.

banken kunnen bijdragen aan het ruilverkavelingsfonds vanuit vrijvallende voorzieningen (die ze eigenlijk moeten nemen voor de huidige portefeuille van intensieve-landbouwleningen) en hun medeverantwoordelijkheid voor de intensivering van de Nederlandse landbouw.

Tot slot

Dit memo schetst op hoofdlijnen een denkkader voor de overgang naar natuurinclusieve landbouw. Varianten zijn natuurlijk mogelijk. De kern is een nieuwe blik op landbouw en landwaarde, een goed verdienmodel voor boeren en een eerlijke transitie waar alle belanghebbenden aan bijdragen.

Het memo is direct toepasbaar op land-gebonden veeteelt (koeien). Onderdelen zijn ook toepasbaar op akkerbouw en andere vormen van veeteelt (varkens, kippen).

Om de uitvoering en financiering over de tijd uit te smeren, kunnen de ruilverkavelingen starten bij de gebieden waar de milieuvervuiling het meest prangend is (zoals Natura 2000-gebieden) en waar boeren graag gezamenlijk de overstap willen menen.