wire group

VENTURING FOR IMPACT

A guide for impact investors

VISION DOCUMENT ON FOOD AND AGRICULTURE

Michiel Lenstra & Godelieve Spaas

Beyond the breaking point towards systems change

Executive Summary

INTRODUCTION

If there is one theme where major global issues come together, it is food and agriculture. The depletion of the earth's resources, poverty and famine, climate change and the obesity epidemic are all linked to the agricultural system – a system that has proven to be very successful in producing large amounts of food. At the same time, however, the agricultural system as it exists today is not capable of securing a sustainable income for farmers, and is causing irreparable damage to the earth.

Looking ahead, we see continued population growth and rising prosperity. The growing demand for food that this creates will put even more pressure on the system. In other words, we seem to have come to a point where we need to make important choices about how we see the future of food and agriculture – as world citizens and more specifically as impact investors.

The second United Nations Sustainable Development Goal (SDG) calls for an end to famine by sustainably producing good food for all.

SDG 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

There are multiple routes to achieving this goal. We can promote sustainable agriculture that provides food for all, restores our planet and enables farmers and other entrepreneurs in the chain to make a living in a variety of ways:

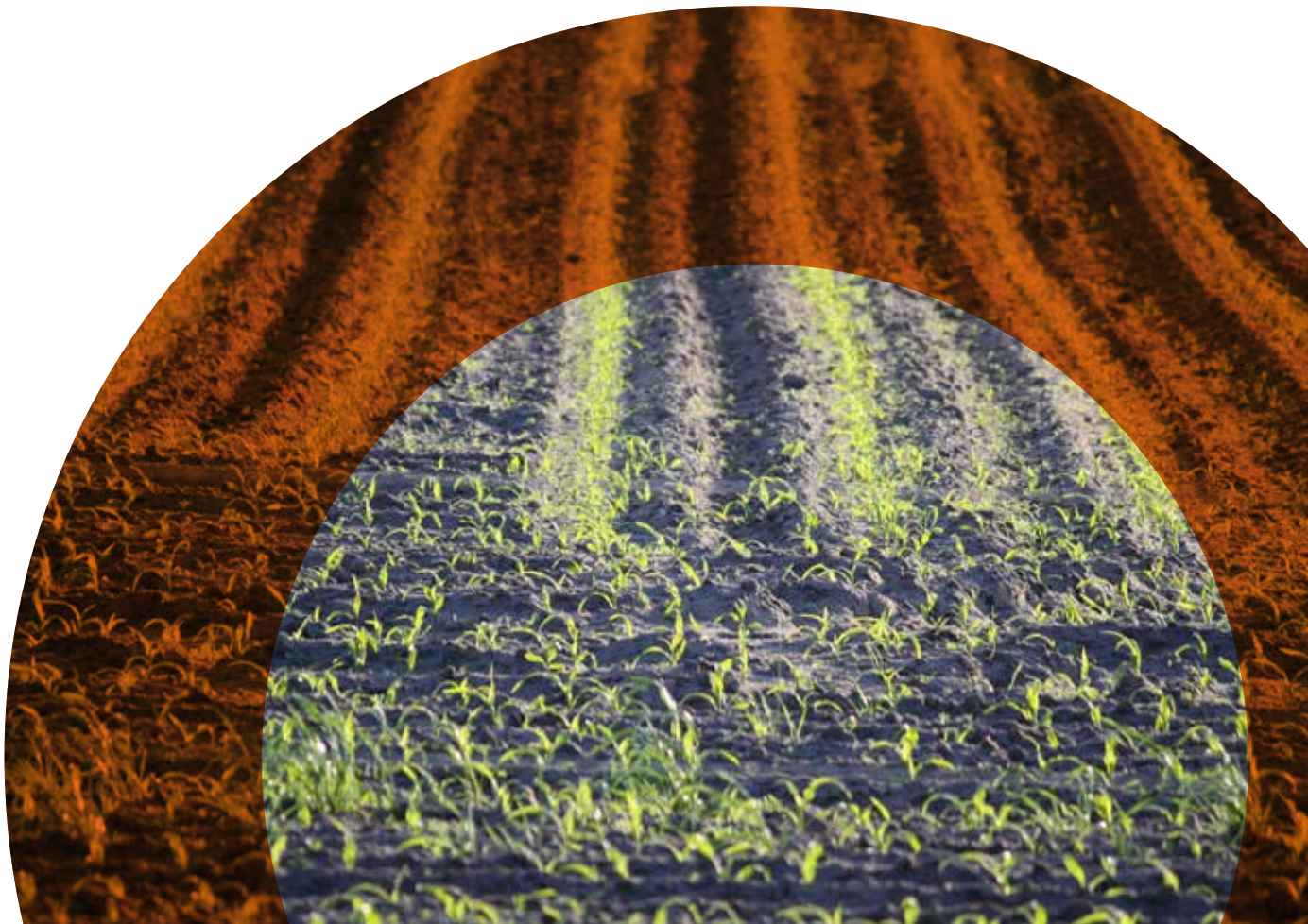
1. Continuing down the same path, with improvements
2. Disruptive changes in agriculture
3. System change by expanding agriculture's playing field

In this document we explore these three avenues based on the view that the best chance of securing a sustainable future for the food and agriculture system lies in restoring the connections between nature, food producers and food consumers, thus creating the conditions for a sustainable balance. We will describe various change strategies that could contribute to this.

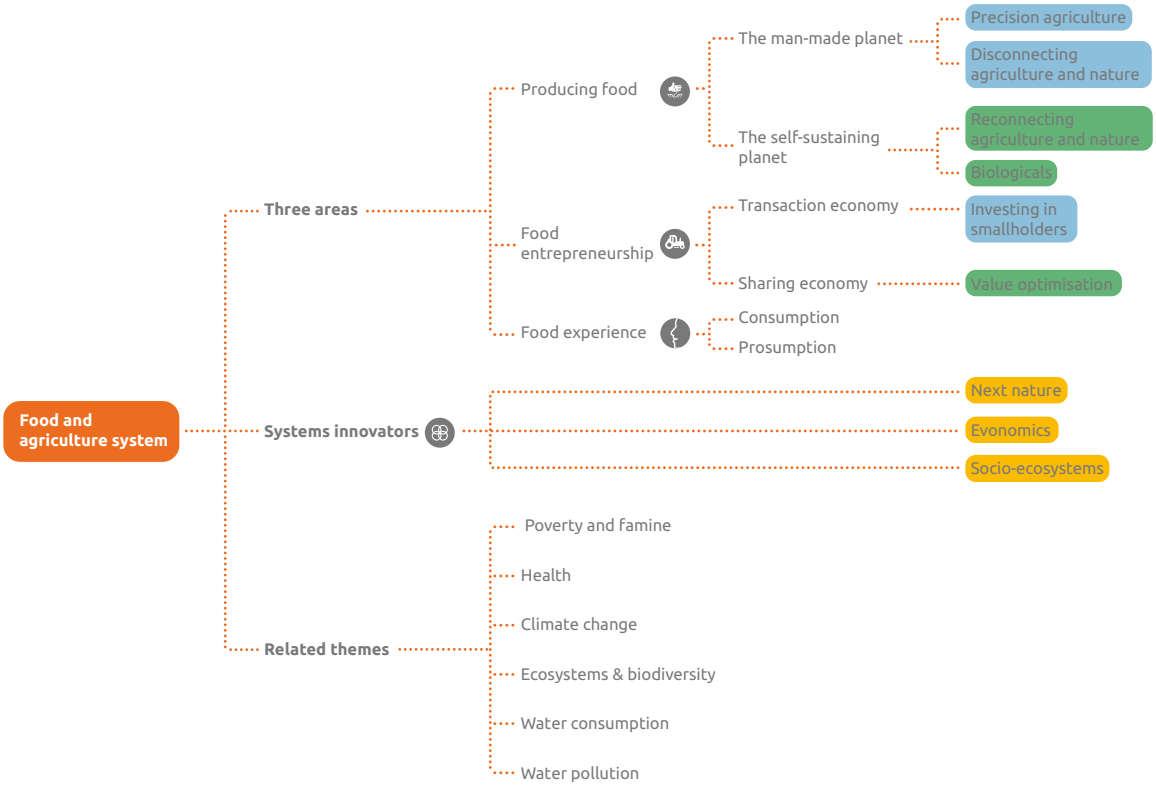
Changes in agriculture can be viewed from various perspectives. We distinguish the following three areas:

- Producing food: growing and producing food within the ecological limits set by our planet
- Food enterpreneurship: growing and producing food based on sustainable value creation
- Experiencing food: securing access to good and healthy food for all, and creating an awareness of the value and importance of food for people and planet

Within each of these areas, we will identify change strategies that are significantly improving the system (state of the art) and change strategies that have the potential to change the system (disruptive). In addition, we will look into three strategies that are designed explicitly to change the system (system change).



Change strategies and related themes in a nutshell



Legend of change strategies:

- State of the art
- Disruptive
- System change

PRODUCING FOOD

By 2050 the world will need to produce about 70% more food calories than in 2006[1]. The answer seems simple: we need to go all-out to produce more. Unfortunately, this will be immensely challenging as food production has come up against ecological limits, as illustrated by the following figures:

- 50% of the earth's available land surface is already being used for food production[2]
- An estimated 24% of this land has been degraded as a result of erosion, silting up and salination[3]
- Agriculture is responsible for about 35% of all greenhouse gases and 70-90% of total water consumption[4]
- In many regions, such as Africa, South America and India, climate change is expected to have a severe negative impact on average yields[5]

So in order to meet growing demand, the ecological limits must not be further exceeded. Within the existing system, which is based on the belief that the earth can be shaped to meet human needs (the man-made planet), various state-of-the-art change strategies could help meet this demand. Disruptive change could stem from the notion that the carrying capacity of our planet is naturally strong; that our planet is a system that we can either degrade or reinforce (the self-sustaining planet).

1 WRI, The global food challenge explained in 18 graphics; link
2 FAO, The state of the world's land and water resources for food and agriculture (2011)
3 International Soil Reference and Information Centre (2009)
4 WRI, The great balancing act (2013)
5 World Bank, World Development Report (2010); MSCI ESG Research, Industry report: food products, (2012); in Brazilë kunnen de opbrengsten in 2050 tot 50% lager liggen dan in 2013

The man-made planet

Change strategy: Precision agriculture

Precision agriculture is based on the idea that every plot of land, every plant even, has different needs and a different potential. By analysing these needs and potential on a small or micro scale, farmers are able to use exactly the right seeds and apply just the right amount of fertilisers and pesticides. This means that, on balance, they need fewer resources. Existing and new technologies that facilitate this change strategy are sensors, drones, satellites, variable rate technology, self-driving agricultural machines and robots, databases (including big data such as meteorological information), and data analytics with which needs can be analysed or even forecast. The vision of the future for this strategy is a farm where machines and robots generate the best possible yield per hectare based on automated data analyses. In 2015, 661 million US dollars was invested in 96 venture capital initiatives in precision agriculture, a 140% increase compared with 2014.[6]

Examples given: ***Open Agriculture Initiative, Saturas, Farmers Business Network***

Change strategy: Disconnecting agriculture and nature

An example of this change strategy, which seeks to disconnect food production and nature, is 'vertical agriculture'. The sun is replaced by LED lighting, for instance, and soil is replaced by water or moist air in which nutrients are dissolved. The range of crops that can be cultivated in this way is still very small, but this strategy is gaining ground. An interesting aspect is that land use and water consumption decline exponentially in this cultivation method. Disconnecting agriculture and nature is the ultimate strategy within the paradigm of the man-made planet.

Example given: ***AeroFarms***

The self-sustaining planet

Change strategy: Reconnecting agriculture and nature

Although the certification of organic farming focuses on replacing chemical fertilisers and pesticides, the principles of organic farming are based on a deep appreciation of the connection between food production and the ecosystems that make this possible. Healthy soil is essential in this respect, and can even act as an important, if not the most important, weapon against climate change. Organic farming, biodynamic farming and restoration agriculture, which is even more symbiotic, can keep ecosystems healthy or even restore them.

Examples given: ***Polyface Farms, SLM Partners, Commonland, Cool Planet***

Change strategy: Biologicals

A large number of companies have embraced biologicals and are developing agricultural products that increase the yields of crops and animals with the aid of naturally occurring organisms. Biologicals can help plants better withstand drought, salty soils, and extreme temperatures. The essence of this change strategy is to closely study and learn from nature – a technology known as biomimicry.

Examples given: ***AgBiome, Indigo, Adaptive Symbiotic Technologies, Push-pull method***

6 AgFunder, Agtech investing report: year in review 2015 (2016); dit rapport dekt niet alle deals in 2015 link

FOOD ENTREPRENEURSHIP

Although food is what keeps us alive, farming is a difficult way to make a living – an existence characterised by low profit margins and poverty. Farmers in the European Union earn as little as 60% of the minimum wage on average.[7] On a global scale, we see that poor people are overrepresented in the agricultural sector: 2.5 billion of the world's 4.0 billion people who survive on less than four dollars a day depend on agriculture for a living.[8] Most smallholders have not made a conscious choice to become farmers, and the challenges they face are substantial. How can we justify that the people who produce our food are so little appreciated in terms of status and income? What conditions can we create to enable farmers to regain their pride as food entrepreneurs who produce nutritious, healthy and safe food and who strengthen our planet's carrying capacity at a fair price?

The current system is built on the 'transaction economy', in which supply and demand are aligned through a linear chain of producers and consumers. Within this system, we are moving towards introducing state-of-the-art solutions to give small farmers better access to this economy. A potential disruptor is a move towards the 'sharing economy', which focuses on principles such as circular thinking and value creation and optimisation within a web of equal parties.

7 European Commission, Developments in the income situation of the EU agricultural sector (2010); link
8 Bain & Co, Growing prosperity Developing repeatable models to scale the adoption of agricultural innovations, 2014

Levi Morsy

The transaction economy

Change strategy: Investing in smallholders

Smallholders have huge potential to contribute to the much-needed growth in food production. While they are already responsible for much of the world's food supply, additional investments could boost global production by 50-60%.[9] This would create a win-win situation as a 1% growth in agricultural production can reduce poverty up to five times as much as 1% growth in other industries.[10] Farmers in developing countries are essential players in the rural economy, which is home to 75% of all people facing famine.[11] Moreover, scientific research suggests that smallholders can boost production in an ecologically responsible way.[12]

9 Foley, J.A., Can we feed the world and sustain the planet (2011); link
10 IFAD & UNEP, Smallholders, food security and the environment (2013); link
11 World Food Programme, Who are the hungry (2015 statistics); link
12 Pretty, J., Agricultural sustainability: concepts, principles and evidence (2008); link

In order for small farmers to be able to participate in the transaction economy, better access to multiple markets is key: the land market, the financial market, the market for technology and knowledge, and product markets. In recent years, various companies have undertaken to make a difference for smallholders in this respect. Market-driven initiatives have the potential to reach many millions of farmers. And the chance of success increases if they capitalise on the mutually reinforcing effect of providing better access to different markets. It is also worth noting that healthy ecosystems are more valuable to poor farmers than they are to rich farmers as poor farmers don't have the resources needed to gain access to alternatives to the 'services' that these ecosystems provide, such as fertilisers, pest control and water.

Examples given: ***Landmapp, Root Capital, FarmDrive, aWhere, Hello Tractor, EM3 Agri, Kennemer Foods, Kisan Network***

The sharing economy

Change strategy: Value optimisation

A broad approach to value optimisation is a central theme within the sharing economy. Value optimisation can serve as a disruptor in the food and agricultural system as the boundaries between the various players become blurred: they can, at one and the same time, be each other's clients, competitors and suppliers. Additionally, the sharing economy can break the zero-sum game where more value for one player automatically means less value for another. Instead, value can increase for several players at the same time. Making better and wider use of agricultural products can add value for all. By applying the principle of circularity, waste and by-products can be re-used as raw materials for new agricultural products. With time, social value will also play a role in agriculture. Negative externalities such as soil degradation, water pollution, greenhouse gases and unacceptably low wages will increasingly be reflected in higher prices for food. On the positive side, farmers who find innovative ways of avoiding these externalities will receive a premium.

Examples given: ***Hello Tractor, Collaborative Farming Australia, Ecozen, Protix Biosystems, Anuvia Plant Nutrients***

FOOD EXPERIENCE

We will study and describe this area with a partner organisation.

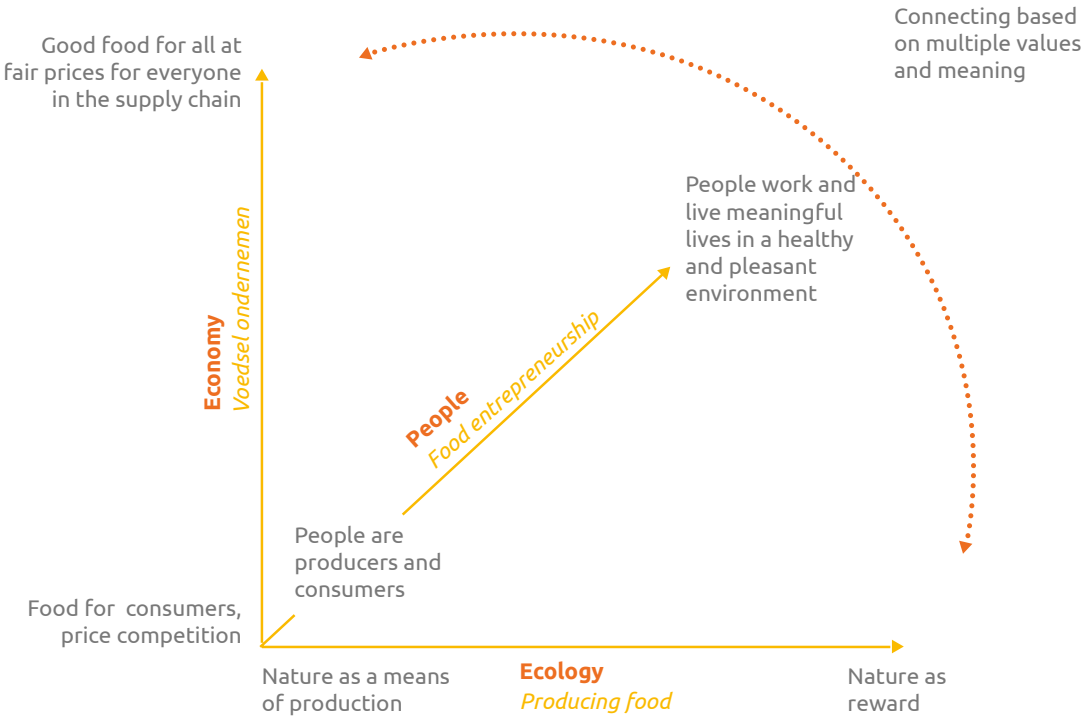
SYSTEEMVERNIEUWERS

Systems innovators aim to overhaul the system, to build it anew. They challenge underlying assumptions and accepted truths in food production, food entrepreneurship and food experience. They start off by defining the values they aim to achieve, using these to inform the best ways and means to create them.

Systems innovators look for meaningful connections in the agricultural playing field:

- From food for consumers at low prices to good food for all people at fair prices – for everyone in the supply chain and for society at large
- From people as producers and consumers within a rigid economic system to people who live meaningful lives in a healthy and pleasant environment
- From nature as a means of production to nature as reward

Expanding the playing field



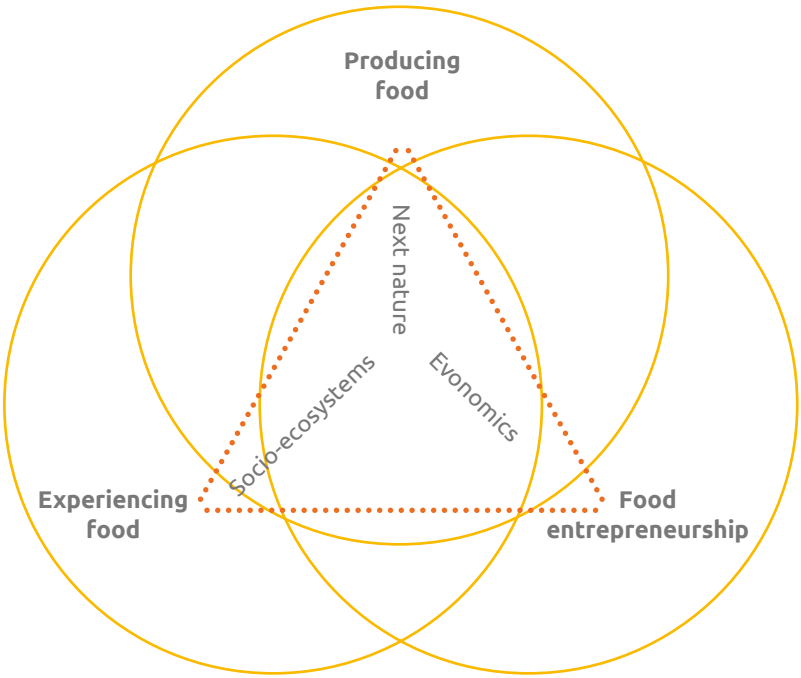
Systems innovators rethink the system by expanding the playing field – which is called transformation by enlargement. Their change strategies see agriculture and food acting as levers for the sustainable development of humans and nature alike, with business, food, landscape, living and working environments all having a value beyond output and profits. Their strategies for change are, unlike those of most state-of-the-art entrepreneurs, inherently subjective, as values are a choice and not yet proven practice or theory.

Connecting thought and practice in the natural and artificial environments as well as in the economic, social and cultural environments creates openings for system change. State-of-the-art and disruptive entrepreneurs typically operate within one of these frameworks, whereas systems innovators step outside. In fact, system change emerges when systems innovators from different worlds and disciplines collaborate. Scholars ranging from sociologists to technology experts, from philosophers to biologists, artists, designers, economists, entrepreneurs, farmers and special interest groups team up to discover, design, think and test ways of doing things differently.

Three change strategies

This document's three different strategies for system change start at different points of the triangle and broaden to include the other perspectives: 'next nature', 'socio-ecosystems' and 'evonomics'.

Three new playing fields towards system change



Next nature blurs the traditional distinction between nature and the man-made environment, with our physical environment considered a single organic whole, and nature and the artificial environment no longer on two sides of a divide. As well as nature such as primary forest, jungle and sea, there's nature created by humans in the shape of homes, roads, water systems, agricultural areas and energy production systems. Next nature, in fact, encompasses everything that we see around us. Next nature does not put one aspect above the other, but rather looks for active collaboration between all environmental factors to achieve optimum benefit for all constituent elements. The new National Environment Vision (NOVI) in the Netherlands (which runs until 2040) takes a single integrated environment as the starting point to address major transition issues such as energy, water, cities and food. The underlying thought is that forests, for instance, can simultaneously serve as agriculture, energy production and a place for living and leisure. Cities, in their turn, can be water, nature and agriculture as well as industrial space. It is by means of crossovers that a whole range of issues can be resolved at the same time and to the benefit of all.

Socio-ecosystems implies that nature and the intangible world are a single, unbreakable whole. Nature and the meaning we give it, the value we attach to it, the relationship we have with it and the expressions we use for it – they're all part of nature. In fact, nature is one with its social and cultural environment. The strategy's basic premise is the interaction between nature and the way in which humans give it meaning, the way we co-exist with nature. At centre stage is the intrinsic value we give to nature. Indigenous knowledge and local cultures have a real part to play in this change strategy.

Evonomics considers economics to be a living and learning system, and hence an evolving one. Like ecology, economics is a diverse, dynamic, agile and self-developing system based on feedback and context. Evonomics puts economics in the context of the spirit of the times, and sees it as a system that evolves in relationship to its social, cultural, natural and artificial context. The sharing economy, local economy, inclusive economy and informal economy are all part of the evonomic system. Herenboeren, for instance, facilitates the development of farms based on locally learning and evolving economic systems focused on producing healthy food for its buyers (who co-finance Herenboeren), regenerating the planet and helping farmers to earn a living.

Examples of systems innovators: ***PhD research by Hannah van Zanten, Tapworld, Meat the Future, Next Nature Netwerk, Stichting Geïntegreerde Visserij, Evolution Institute, Herenboeren***

STRATEGIES FOR IMPACT INVESTORS

Choosing a change strategy

A key purpose of this document is to help impact investors decide what future they see for the food and agriculture system. To help them select a change strategy they wish to support, we have rated these strategies on the basis of a 4P check:

Profit: How economically viable is this change strategy?
People: How much does this change strategy contribute to increased food production and food security?
Planet: Does the change strategy contribute to the sustainability and well-being of our planet?
Pneuma*: Does the change strategy contribute to the recognition and development of the intrinsic values of food and agriculture, produced and consumed in harmony with the earth and people's well-being?

**'Pneuma' is from the ancient Greek word meaning breath, spirit or soul.*

Based on a combination of research and personal review, our scores and ratings are essentially subjective and we are happy to engage and hear different views. In addition to our 4P scores, we indicate a number of themes the change strategies touch on.

Change strategies and related themes

Change strategy	Examples	Areas	4P checks				Themes					
			Profit	People	Planet	Pneuma	Poverty and famine	Health	Climate	Ecosystems & biodiversity	Water con-sumption	Water pollu-tion
Precision agriculture	Drones, sensors, software										●	●
Disconnecting agriculture and nature	Vertical agriculture, hydroponics							●			●●	●
Reconnecting agriculture and nature	Organic farming, restoration agriculture								●●	●●	●	●
Biologicals	Biofertilisers, biopesticides										●	●
Investing in smallholders	Market access for small farmers						●●	●				
Value optimisation	Circular models, waste prevention, externalities						●		●	●	●	●

Legend:

- High
- Medium
- Low
- Production
- Business

‘We diligence’ for system change

When trying to identify and understand initiatives, companies and experiments in agriculture and food that contribute to systems innovation, we face two questions that are also encountered to a lesser degree in disruptive or state-of-the-art initiatives:

1. Are we able to describe a company’s underlying playing field?
2. Can we see and describe emerging system change?

Description requires language, and so does the ability to see a broader playing field or different rules. As the great Dutch football player Johan Cruyff is often quoted as saying: “You won’t see it until you get it.”[13] We need a framework to identify and put into words what it is these systems innovators are doing and what they are looking to achieve. We have developed a so-called ‘we diligence’ to do so, described in detail in our vision document.

13 https://nl.wikipedia.org/wiki/Cruijffiaans

ABOUT WIRE GROUP

Wire Group is a leading impact house in the Netherlands that offers assistance in every aspect of impact investing: education, research, strategy development and building impact portfolios. We are dedicated to advising investors seeking competitive financial returns with a lasting social and environmental impact. We believe strongly that investment capital has transformative power and can address the local and global challenges we face. Our services are designed to provide full customisation based on clients' values, specific goals and priorities.

Over the years, Wire Group has built a strong, committed client base of high net-worth individuals, entrepreneurial families and endowed foundations. We offer clients a wide range of services, including participative training, workshops and investor circles, consultancy in research and designing customised impact strategies, as well as services to build (100%) impact-focused portfolios across asset classes. For more information, go to

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The examples given in this document are not intended as investment advice and/ or are not necessarily open for investment.