
Defining Nature-Positive Food Systems

Background report

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This report represents our understanding of nature-positive food systems. It has no intention to be exhaustive, nor complete. Although based on the most recent insights, the aim of this document is to provide a working definition that answers part of the research question and serves as a stepping stone for the sequential steps of the project.

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This report presents a working definition of “nature-positive food systems” and describes the discussions in the literature and internally that have led to this definition.

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Working Document

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1 Summary

In recent years the term 'nature-positive food systems' has gained attention. Attention has evolved from global advocacy about the reciprocal relationship of food systems with nature towards really rethinking these systems based on these relations. The term, however, leaves room for interpretation, and a blurred understanding of the concept may undermine meaningful steps towards required change. Therefore we here explored how "nature-positive food systems" could be meaningfully defined, in a way that is beneficial for nature-positive transitions. To do so, we formulated a working definition, based on literature and internal discussions, acknowledging that defining nature-positive food systems is contextual and a process in which increasing shared understanding is the aim, not obtaining a final definition. As working definition, we refer to nature-positive food systems as food systems that have nature at the heart of decision-making and that will lead to increased biodiversity and improved ecosystem functioning through collective understanding and action. It is important to acknowledge that also nature-positive food systems need to provide sufficient and healthy food for people. The definition reflects five building blocks: "nature", "positive", "food systems", "nature at the heart" and "collective understanding and action". These reflect different components of the term "nature-positive food systems" and elements that were frequently mentioned in existing definitions of "nature-positive". The five building blocks are explained in this report, referring to discussions in the literature and internally that have led to the working definition.

2 Introduction

Global biodiversity is rapidly declining and will continue to do so if no further action is taken (IPBES, 2019; Leclère et al., 2020). Bending the curve of biodiversity upwards requires an integrated strategy that includes ambitious conservation targets and changes in food production and consumption (Leclère et al., 2020). With such ambitious efforts, biodiversity may even become higher than current levels. This idea of 'nature-positive' reflects the increasing global consensus on the ambition to not only halt biodiversity and ecosystem decline, but reverse the destruction of nature and regenerate nature (Locke et al., n.d.; Mommer et al., 2022). It implicitly takes biodiversity as an important indicator for the health of nature. Moreover, 'nature-positive' carries a shift in perspective from seeing nature merely as something instrumental to something with an intrinsic value and something to interact with rather than control (Mommer et al., 2022). This connects to an increasing shift of sustainability paradigms towards regenerative sustainability in which the focus shifts from meeting human needs while doing less harm towards improving human wellbeing and the viability of ecological systems. As such, regenerative sustainability builds upon a holistic view and holistic approaches based on how thriving living systems function, addresses the root causes of (un)sustainability, and is inherently more inspiring and motivational (Gibbons, 2020).

Food systems are both key drivers of and affected by climate change and biodiversity loss (IPBES, 2019; Meinzen-Dick et al., 2021). Food systems account for one third of the global greenhouse gas emissions (Crippa et al., 2021) and negatively affect nature and biodiversity through agricultural expansion, freshwater withdrawals and pollution (IPBES, 2019). At the same time, more than half of the global gross domestic product (GDP) is moderately or highly dependent on nature and its services, and biodiversity loss is considered among the top five risks to the global economy (UNEP et al., 2023; WEF, 2020). Climate change and biodiversity loss lead to a staggering cascade of potential effects and risks to our wellbeing, health, safety and security (IPBES, 2019; IPCC, 2022). Part of these impacts will be effectuated through agricultural productivity losses. Of course, this is the global trend and there are regional differences. While large parts of the world are highly affected in a negative way, change can also open new opportunities for food systems elsewhere. This still requires balancing food systems, nature and biodiversity. The adverse effects of climate change and biodiversity loss on the food system call for an urgent reconsideration of food systems, in which food systems positively affect nature and help to reverse the decline in biodiversity.

Globally the ambition to value and increase nature's positive impacts on society is emerging. Food systems could play an undeniable role in achieving this ambition. However, it is not yet evident how food systems can be nature positive. Such qualification is particularly challenged by the ambiguous notion of the concept of nature. The concept of nature is perceived differently by different people (Farjon et al., 2016), and goes beyond biodiversity alone: encompassing non-living parts of ecosystems (Locke et al., n.d.) and people (Attfield, 2021; Bastmeijer, 2011). The potential risk of a too broad definition of nature, however, is that a "nature-positive food system" would refer to a food system that has no negative effects on whatever may be thought of, while it is highly doubtful whether such food systems can exist. On the other hand, a too narrow definition of nature would bring the risk of referring to any food system that has a positive effect on one particular species as being nature positive, while it may negatively affect other aspects of biodiversity or nature as a whole.

A blurred understanding of the concept of "nature-positive food systems" may undermine meaningful change (WBCSD, 2021). Therefore we explore how "nature-positive food systems" could be meaningfully defined, in a way that is beneficial for nature-positive transitions. To do so, we here formulate a working definition, acknowledging that defining nature-positive food systems is contextual and a process in which increasing shared understanding is the aim, not obtaining a final definition. Several definitions of nature-positive have already been put forward but only few focus on food systems and they often leave room for interpretation on

the meaning of nature, positive, food systems, and other elements described in existing definitions (Table 1). We build on existing definitions by distilling common elements and providing interpretations of them by describing the discussions in the literature and internally that have led to the working definition.

Approach

We first reviewed existing definitions described in the scientific and grey literature . From there, we distilled elements that were mentioned in several definitions and elements for which further discussion would be required. These elements served as a basis for internal discussions. This report presents the main discussion points and choices that have been made for our working definition.

Eight key definitions of “nature-positive” and “nature-positive food systems” are listed in Table 1. These definitions have offered ample elements to shape our working definition. Emphasizing biodiversity and ecosystems as integral components of nature, the discourse consistently highlighted the importance of halting loss, embracing offsetting measures, promoting regeneration, and adhering to a structured timeline to embody the essence of 'positive'. The last two definitions in Table 1 accentuated the imperative for a nature positive food system not only to abstain from depleting nature but to actively contribute to its restoration and enhancement. Beyond conceptual elucidation, certain sources also aimed to operationalize the definition by integrating actionable components, stressing the centrality of ecosystems in design and advocating for collaborative efforts, both of which warrant inclusion in our formulation.

Table 1 Eight key definitions of “nature-positive” and “nature-positive food systems”.

Author, year	Title	Definition
UNEP, 2021	Adapt To Survive: Business Transformation in a Time of Uncertainty (Global Environmental Outlook for Business)	“A Nature-positive Economy [is] an economy that is regenerative, collaborative and where growth is only valued where it contributes to social progress and environmental protection”
World Economic Forum, 2020	The Future Of Nature And Business (New Nature Economy Report II)	“A nature-positive built environment shares space with nature, putting whole ecosystems rather than humans alone at the centre of design” “Nature-positive extractive processes have the potential to minimize destructive land management practices and enhance conservation efforts to offset biodiversity impacts that cannot be either avoided or mitigated” “A nature-positive energy transition has the potential to further both global climate and nature goals”
Global goal for nature (Locke et al., 2021)	A Nature-Positive World: the Global Goal for Nature	“Zero Net Loss of Nature from 2020, Net Positive by 2030, and Full Recovery by 2050” “Nature-positive includes a focus on species distribution, abundance, functional traits, genetic diversity, and demographic trends as well as the intactness and integrity of ecosystems and biomes. It also includes the functioning of ecological and global processes such as hydrology, rainfall patterns and migration that support biodiversity, maintain drinking water supplies, sustain agriculture, and ensure a stable climate. Together these provide a resilient planet able to cope with shocks and stresses without crossing destabilizing tipping points. Abundance and functionality, across scales from local ecosystems to the entire Earth system, should be our goal for all life on Earth.”
IUCN, 2020	World Conservation Congress Resolution 116	“... an equitable, nature-positive and net zero world [would] ensure there is more nature globally in 2030 than there was in 2020, by halting and reversing the loss of nature to put nature on a path to recovery for the benefit of all people and the planet by 2030, as well as tackle climate change, achieve the Sustainable Development Goals, and enable people and communities to thrive in a healthy and stable future”
Xue et al., 2022	Metrics for a nature-positive world: A multiscale approach for absolute environmental sustainability assessment	“Meeting the urgent need of stopping and reversing nature loss to develop a nature-positive world requires metrics to quantify the extent to which human activities respect nature’s constraints. Metrics

		for absolute environmental sustainability measure the extent to which human activities exceed ecological carrying capacity”
CGIAR 2022	Just launched: CGIAR Initiative on Nature-Positive Solutions	What makes up a nature-positive approach? This holistic concept focuses on ensuring that agriculture helps us stay within planetary boundaries through: 1. Conservation of biodiversity 2. Management of biodiversity and natural resources to provide ecosystem services 3. Avoiding further degradation and restoring nature when necessary 4. Better management of waste and a circular economy.
Mommer, 2022	Mansholt lezing: Nature-positive futures Food systems as a catalyser for change	“Global consensus is increasing: “our world must not only become net zero, but also nature-positive, for the benefit of both people and the planet” Being ‘nature-positive’ means creating a world where we halt and reverse the destruction of nature by 2030, with recovery by 2050. Becoming nature-positive also needs to engage with the specificities of people’s needs, culture and rights. This will allow thriving biodiversity, ecosystems and nature-based solutions to play a critical role in halting climate change and allow people – now and in the future – to flourish. The concept of nature-positive signals a paradigm shift in how countries, businesses, investors and consumers value nature. It goes beyond simply ‘minimising harm’ to nature, to enriching biodiversity and enhancing the capacity of ecosystems to regulate climate and provide other important services.”
Hodson de Jaramillo, 2023	Boost Nature-Positive Production	“Nature-positive food systems are characterized by a regenerative, non-depleting and non-destructive use of natural resources. This is based on stewardship of the environment and biodiversity as the foundation of critical ecosystem services, including carbon sequestration and soil, water, and climate regulation. Nature-positive food systems refer to the protection, sustainable management and restoration of a productive system. Finally, nature-positive food systems cover the growing demand for food in a sufficient way and include sustainable and healthy nutrition.”

3 Working definition

We refer to nature-positive food systems as **food systems** that have **nature at the heart** of decision-making and that will lead to **increased biodiversity and improved ecosystem functioning** through **collective understanding and action**.

This definition thus defines nature-positive food systems not as a state to be achieved, but as a continuous process towards increased biodiversity and improved ecosystem functioning in order to secure the stability and habitability of the Earth system.

The working definition reflects choices that have been made in discussions that were held by dissecting nature-positive food systems into the following questions:

- What do we mean with nature?
- What does it mean to be positive?
- What do we mean with food systems?

On top of these questions, the working definition reflects the following elements that have been mentioned frequently in existing definitions of nature-positive (CSB, 2022; Global Summit Dialogue, 2021; SBTN, 2021; UNEP, 2021; zu Ermgassen et al., 2022):

- Nature at the heart of decision making
- Collective understanding and action

To better understand the concept behind our definition, we have defined five building blocks based on wider discussions as follows:



Nature (in our definition described by 'biodiversity and ecosystem functioning'): The word "nature" in "nature-positive" is operationalized here as biodiversity and ecosystem functioning, referring to the variability of living organisms from all sources and the processes and interactions of the living and non-living elements of ecosystems, such as soils, water, climate, and more, that collectively make up the living space of our planet.



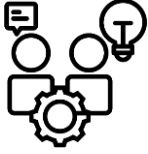
Positive (in our definition described by 'increase and improve'): It refers to the foundational objective of increasing biodiversity and regenerating ecosystem functioning in order to secure the stability and habitability of the Earth system in which we live and that we share with other life forms.



Food system: The food system encompasses all activities from production to consumption, tied to socio-economic and environmental drivers. The global food system is strongly imbalanced in different ways and at the same time intricately connected. The transformation of food systems requires a system approach in which spatial and temporal strategies are indispensable. Socio-economic and environmental paradigms also call for urgent change, with reconsideration of the role of nature in the system.



Nature at the heart: Highlight the paramount importance of incorporating nature as a central consideration in decision-making processes, particularly in the pursuit of food security. Emphasize the need to align human interests with nature rather than seeking a compromise, ultimately aiming to improve the context of all life, including human life.



Collective understanding and action: The last building block emphasizes the interconnectedness of a nature-positive mindset among stakeholders, promoting collective responsibility, dialogue, and action, thereby addressing power dynamics and plurality in knowledge, values and cultures. Individual actions also lead to nature-positive outcomes along the system, but collectiveness is foundational for true systemic change.

4 Building blocks

4.1 Nature – biodiversity and ecosystem functioning

Nature is a concept that can be understood and defined in various ways, and its meaning can vary depending on the context and perspective. In any endeavour to understand nature-positive, it is essential to discuss how to define nature.

There are many different conceptions of nature, often deeply rooted in people (Ducarme, 2020). Ranging from more general definitions as 'the external world in its entirety' (Merriam-Webster) to more specifically 'the phenomena of the physical world collectively, including plants, animals, the landscape, and other features and products of the earth, as opposed to humans or human creations' (Oxford Dictionary). Studying the definitions showcase that the main discussing point in defining nature is whether it is opposed to or includes humankind and its activities. The state of nature and its importance for humankind is fundamental; biodiversity a critical indicator.

The modern Western worldview has historically emphasized a clear demarcation between culture, humans, and nature, a dichotomy tracing its roots back to the Old Testament. This distinction, often referred to as the 'nature/culture divide,' positions nature as a separate object and as a resource for human use (Castree, 2013; Pattberg, 2007). Later, the term 'Arcadian' emerged at the same time of the Industrial Revolution, which advocated a simple, humble life for man, living in peaceful coexistence with other organisms. The Romantic movement in 19th century challenged the notion of human dominance over nature, idealizing the untamed natural world for its intrinsic beauty and purity (Uggla, 2010; Worster, 1977).

However, the nature/culture divide has faced criticism for its cultural and limited applicability (Descola, 2013; Latour, 1993), giving rise to a fundamental question: "What is nature?". Importantly, the answers to this question must be plural, and the definitions of nature are inherently context-bound, influenced by subjective, normative, and dynamic views and values, whether explicitly or implicitly.

To understand what 'nature' means in the context of nature-positive food systems we delve into the purpose of this concept. This purpose, as elucidated by Mommer et al. (2022), transcends the mere goal of 'minimizing harm' to nature; rather, it underscores a more ambitious agenda of enriching biodiversity and bolstering the capacity of ecosystems to fulfil critical roles, such as climate regulation and the provisioning of vital ecosystem services. This emphasis is added because of the negative impact of the current food system on these biological and ecological systems. This impact is often measured with a range of biodiversity and ecosystem indicators (Leclère et al., 2020) with the aim of not only capturing conservation values but also the ecosystem stability and functions. Hence, we use the phrase "biodiversity and ecosystem functioning" in our working definition.

One recurring discussion surrounds the role of humans in the concept of nature. This is embedded in the wider and historical discourses on the human-nature relationship, from ego (human) centric to eco-centric or even seva¹-centric (Attfield, 2021; van Weert et al., 2023). This can be illustrated through the perspectives on humans as controlling or using nature, humans as stewards over nature, or humans as part of nature (no distinction).

In this working definition, biodiversity and ecosystem functioning is a frame that highlights the impact of the human-driven food system on other living and non-living systems, reducing the emphasis on humans as

¹ In Hinduism seva is the concept of service to God or humanity, without the expectation of return. It challenges this concept to create a new paradigm that integrates concepts of communal wellbeing, equality, and inclusiveness.

distinct from nature. This does, however, not imply that the human part is removed in the concept of a 'nature-positive food system'. Humans coexist and are deeply interconnected with animals and the entire ecosystem. Hence, the food system element still underscores the significance of livelihood security and human well-being (as discussed in the food system section) while emphasizing the need to strike a balance. In other words, a transition to a nature-positive food system should not overlook human interests.

The phrasing of biodiversity and ecosystem functioning captures both biotic and abiotic parts of nature and acknowledges its dynamic character. Biodiversity is defined by the Convention on Biological Diversity (CBD), signed at the United Nations Conference on Environment and Development in 1992, 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.*' (Convention On Biological Diversity, 1992). Ecosystem functioning refers to the processes and interactions that occur within an ecosystem, leading to the overall stability and productivity of that ecosystem. Ecosystems are comprised of living organisms (plants, animals, microorganisms) and their physical and chemical environment, and their functioning is a complex interplay of various ecological processes. These processes include nutrient cycling, energy flows, pest and disease control, water flows and primary productivity.

In assessing and quantifying 'nature', diverse biodiversity indicators come to the forefront. These indicators are tools for evaluating the wellbeing, abundance, and diversity of species and populations. Furthermore, the assessment extends to ecosystem indicators, which play a pivotal role in gauging the overall health, functioning, and resilience of ecosystems. This evaluation spans not only biotic elements but also encompasses abiotic factors like water, soil, air, climate, and the intricate web of interactions that sustain life on Earth (Locke et al., n.d.). This comprehensive approach underscores the overarching goal of promoting abundance and functionality at multiple scales, from local ecosystems to the global system on Earth.

4.2 Positive – framing 'increase and improve'

The term 'positive,' within the definition of a 'nature-positive food system', encapsulates a fundamental objective: steering biodiversity and ecosystem functioning towards a system that guarantees the stability and sufficient productivity on Earth, which may vary over space and time. This concept represents a proactive and often restorative approach that transcends the mere reduction of negative impacts on nature. It shifts the focus towards conservation, regeneration, and growth, marking a departure from previous 'do no harm' and 'no net loss' approaches.

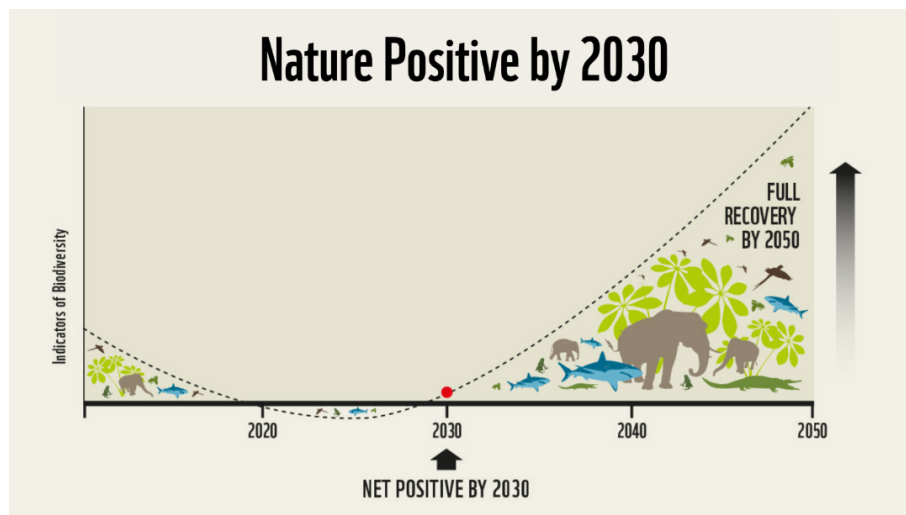


Figure 1: This graph illustrates what is meant with nature-positive, by recognizing that some ongoing loss is unavoidable given current trends and identifies the goal of a net improvement to a nature-positive condition by 2030 (from a 2020 baseline) and full recovery by 2050. Figure from <https://www.naturepositive.org/>.

Several NGOs have rallied behind an ambitious global objective to attain nature-positivity by the year 2030 (Locke et al., n.d.). This Global Goal for Nature delineates a clear roadmap, featuring three distinct and measurable temporal milestones: 'Zero Net Loss of Nature' commencing from the reference year 2020, 'Net Positive' aspired for by 2030, and 'Full Recovery' targeted by 2050 (Figure 1). Implicit within this overarching framework is the establishment of a 2020 baseline against which the augmentation of biodiversity is to be gauged. This baseline is arbitrary but allows to make the change in biodiversity measurable. The concept of 'nature-positive' marks a profound paradigm shift in the perception and valuation of the natural world. This shift transcends traditional approaches and introduces novel strategies for extractive processes, aiming to minimize destructive land management practices while simultaneously augmenting conservation endeavours and preferably beyond conservation: regeneration in terms of giving way again to natural processes that have been restricted in previously dominant practices.

The objective of "full recovery by 2050" implicitly refers to restoring biodiversity sufficiently for securing the stability and productivity of the Earth system, and stresses the urgency for this process (Locke et al., n.d.; Obura et al., 2023). This is a global ambition, that may be difficult to translate to individual food systems. The phrasing used in the working definition refers to *increasing* biodiversity and *improving* ecosystem functioning, thus only indicating a direction and leaving a timeline and desired level undefined. Such levels are expected to differ per food system, with action being more urgent in some food systems than in others, and the level to which biodiversity should increase and ecosystem functioning should improve would depend on the local context. Furthermore, food systems often connect different locations of

production, processing and consumption in an (inter)national market, and affect the biodiversity, both in the food systems as well as in natural habitats in different ways, which makes it more complex to define desired levels. Finally, becoming nature-positive should not ignore the specificities of people's needs, culture, and rights (Mommer et al., 2022). In this sense, heralding a promising trajectory towards harmonizing human activities with nature is crucial, as offset of the adverse impacts on biodiversity can be difficult to avoid or mitigate.

The term 'recovery' is arguable, especially in relation to the regenerative ambitions which emphasize more than recovery alone. Nature always evolves. So, where recovery seems to focus on a previous state, nature-positive could also imply a new state of nature.

In the context of nature-positive food systems, the system-level approach plays a pivotal role in mapping the synergies and trade-offs of food system activities. Taking a system approach entails striving to trace all effects of food system activities on nature. These may be positive for some species, negative for others, positive in some areas, or negative in others. This leads to the following questions: Should all effects on nature be positive, or only the overall effect? How to measure such overall effect? Can a food system be called 'positive' if it has a positive effect on many aspects of nature, but a negative impact on parts of it?

The local specificity of ambitions for desired biodiversity levels does not mean that a desired level should not be defined. Omitting such measurable elements holds the risk of diluting the term (Milner-Gulland, 2022). Classifying a food system as overall nature-positive or not, may be irrelevant as long as sufficient progress is achieved towards desirable biodiversity levels. Choices and directions are inherently political and involve different views and visions, requiring 'systemic ethics' (Bui, 2019; Wigboldus, 2020), however in a multi-aspectual perspective, unsustainability in one place (or entity) cannot be compensated for by having more sustainability somewhere else, according to Wigboldus (Wigboldus, 2020).

4.3 Food systems

Food systems comprise all activities from food production to consumption and their links with socio-economic and environmental drivers (Ericksen, 2008; Ingram, 2011; Van Berkum et al., 2018). Figure 2 depicts how food system activities are linked with socio-economic and environmental drivers and four aspects of the "Food Systems approach": food security, ensuring a healthy diet, fair distribution of costs and revenues, and sustainability. The food system functions as a socio-ecological system, where socio-ecological factors determine what the food system looks like. It highlights the importance of the balance between humans and nature in the food system (International Institute for Sustainable Development, 2021).

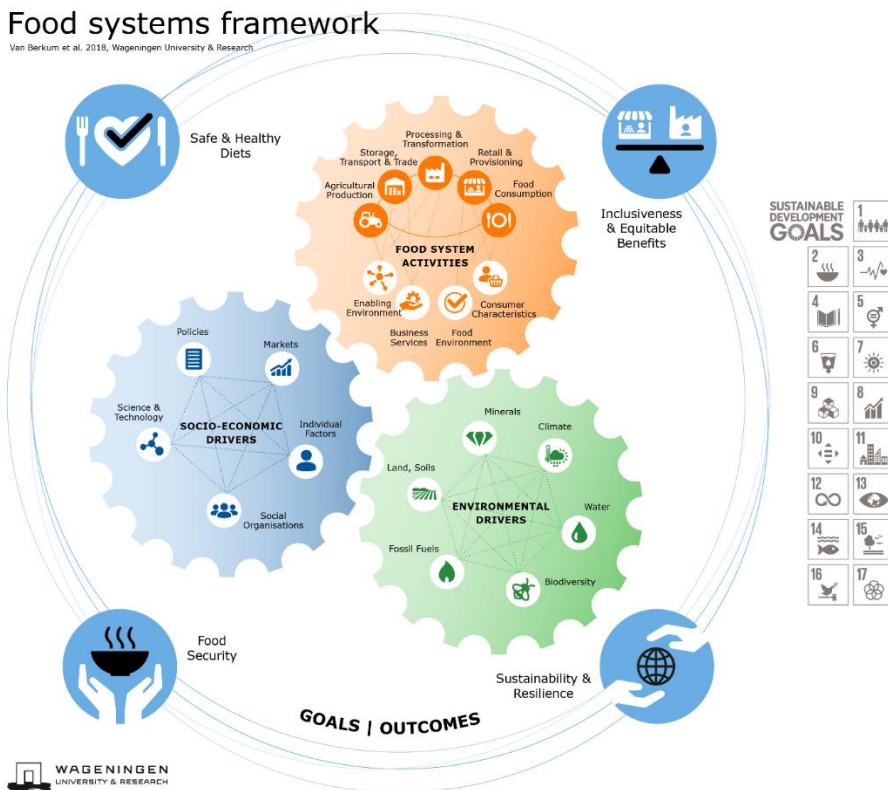


Figure 2: Visualization of the food system framework (Van Berkum et al., 2018)

Key to the idea of a food system, is the concept of system thinking. This drives the focus away from part of the system, such as merely food production, to the entire system. Such system thinking helps to objectively compare systems, including aspects that may not be visible on the foreground. For example, comparing systems in terms of production with a system lens would not only focus on this production but also on the consequences that a difference in production has on production elsewhere, assuming an equal number of persons has to be fed, or on differences in inputs used between the systems that result in differences in production, but may also have different environmental consequences.

Food systems are demarcated by system boundaries. Such boundaries do not necessarily follow geographic boundaries and one may question whether demarcating boundaries is necessary, especially when encompassing trade. Yet, when a system is not demarcated by boundaries, the entire world would be included in the system, which would lead to complex analyses. Still, a food system can be defined on multiple spatial scales and with different scopes. Food systems not only provide food for the current population, but need to be transformed to provide food also for future populations. This temporal aspect and the uncertainty with how

food demands will develop, is another complexing feature, but needs to be considered when searching for nature-positive transitions of food systems.

For example, a food system approach could focus on the consumption of Dutch consumers; including all food consumed and the preceding steps of processing, transportation and production, within and outside the Netherlands. In such an example, all activities not related to production for Dutch consumers would fall outside the system boundaries. Rather than focusing on all consumption, the food system approach may also focus on a single category of products, for example European dairy consumption; including all dairy products consumed and the preceding steps of processing, transportation and production, within and outside Europe. Alternatively, the food system approach could focus on production rather than consumption, such as coffee production in Ethiopia; and the subsequent steps of transportation, processing and consumption in all parts of the world. So, although system boundaries may be different, they are clearly defined in all of the examples above.

Nature is already implicitly present in the food system approach in the notion of environmental drivers and outcomes, and in the goal of sustainability, where food systems are both key driver of and affected by climate change and biodiversity loss. Food systems account for one third of the global greenhouse gas emissions (Crippa et al., 2021) and affect biodiversity through agricultural expansion, freshwater withdrawals and pollution (IPBES, 2019). Climate change and biodiversity loss lead to a staggering cascade of potential effects and risks to our wellbeing, health, safety and security (IPBES, 2019; IPCC, 2022). Part of these impacts will be effectuated through agricultural productivity losses.

Socio-economic and environmental drivers may seem to contrast with the idea of system boundaries. Indeed drivers may be interpreted as external to the system, yet this is not in conflict with a bounded system. For example, climate change may influence food systems by causing weather extremes, thereby influencing the food system activities. At the same time, climate change is influenced by greenhouse gas emissions from food system activities. As the food system framework in Figure 2 shows, there are three interacting sub-systems: food system activities, the socio-economic system and the environmental system.

4.4 Nature at the heart of decision-making

In the context of a nature-positive system, the focus shifts from human-centric design to one that integrates entire ecosystems into the core of the design philosophy (CSB, 2022; SBTN, 2021; WEF, 2020). This shift seeks to place nature, in all its complexity, at the forefront, rather than isolating humans as the primary consideration. The perspective presented by Obura et al. (2023) adds depth to this discourse. On the one hand, prioritizing the central role of nature and establishing a minimum level of 'biodiversity' necessary for a stable future, hinges on the condition of species and ecosystems, emphasizing the need to safeguard the ecological threshold. Conversely, the imperative of ensuring equitable access to the benefits of nature, thereby enabling all humans to escape poverty, hunger, and experience wellbeing through nature's contributions across generations, places humans at the core of the 'food system'. This dual perspective underscores the existence of synergies and trade-offs between policy priorities that seek to enhance human wellbeing, such as eradicating poverty and hunger, and those aiming to conserve and restore natural ecosystems.

We thus define "Nature at the heart of the decision-making" as incorporating nature as a central consideration in decision-making processes, particularly in pursuing food security and related values. Hence, putting nature at the heart of decision making does not mean that increasing biodiversity is more important than other values, such as improving food security or livelihoods, but emphasises the aspiration to align human interests with nature rather than seeking a compromise, ultimately aiming to improve the context of all life, including human life (Locke et al., n.d.). Putting nature at the heart of decision-making means accounting for environmental and ecological considerations in all policy and planning processes; local, national, or global. It involves recognizing the intrinsic value of nature and understanding that the health of the environment is intimately connected to human wellbeing.

Nature at the heart of decision-making is already applied in various contexts, taking nature in consideration in design or in assessing potential impacts of actions. Some examples are mentioned below:

Considering natural processes in design

- **Water and soil guiding:** soil and water systems have a critical role in how landscapes are designed (Rooij et al., 2023).
- **Agroecology:** "... the application of ecological concepts and principles to the design and management of sustainable agroecosystems" (Gliessman et al., 1998). Also other agricultural concepts, such as regenerative agriculture, conservation agriculture and permaculture share the objective of restoring nature, especially in the soil (Manshanden et al., 2023).

Considering impacts on nature

- **Ecosystem Health:** Nature-positive food systems recognise that healthy ecosystems are essential for food production. They prioritise protecting and restoring ecosystems, including forests, wetlands, rivers, and oceans, which contribute to soil fertility, water purification, pollination, and pest control (United Nations Food Systems Summit, 2021).
- **Biodiversity Conservation:** These systems emphasise the importance of preserving and enhancing biodiversity. Biodiversity in agriculture can provide resilience against pests and diseases, enhance nutrient cycling, and improve overall ecosystem stability (Cappelli et al., 2022).
- **Reduced Environmental Impact:** Decision-making in nature-positive food systems considers the environmental impact of food production. This includes reducing greenhouse gas emissions, minimising water usage, and avoiding harmful chemicals and pesticides (Mommer et al., 2022).
- **Circular Economy:** These systems encourage a circular economy approach, where waste is minimised, and resources are reused and recycled within the food system. This reduces pressure on natural resources and minimises pollution (Antonis et al. 2020).
- **Responsible Sourcing and Supply Chains:** Nature-positive food systems focus on responsible raw materials and ingredients sourcing. Supply chains are transparent and traceable to ensure that products are produced in an environmentally and socially responsible manner (Mommer et al., 2022).

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- **Consumer Education:** Educating consumers about the environmental and social impacts of their food choices is another aspect of these systems. Empowering consumers to make informed choices can drive demand for sustainable and nature-positive products (Mommer et al., 2022).
 - **Research and Innovation:** Continuous research and innovation are essential for finding new, more sustainable food production methods. This includes developing technologies and practices that reduce the ecological footprint of agriculture (De Boer & Van Ittersum, 2018).

A nature-positive food system emphasises the interconnectedness of food production and consumption and the natural environment. By putting nature at the core of decision-making, it seeks to ensure that our food systems contribute to, rather than detract from, the health and wellbeing of ecosystems, which are essential for food security and overall planetary health.

4.5 Collective understanding and action

The last building block emphasizes the interconnectedness of a nature-positive mindset among stakeholders, promoting collective responsibility, dialogue, and action addressing power dynamics and plurality in knowledge, values and cultures. These are relevant because nature-positive food systems are not a state to be achieved, but a continuous process in which collective understanding and action are central. The concept of nature-positive signals a paradigm shift in the valuation of nature (Mommer et al., 2022). However, it is still a first signal.

Nature-positive food systems and collective understanding and action go hand in hand, as addressing the complex challenges in our food systems requires a collaborative effort across various stakeholders. Collective action is essential for creating a nature-positive food system because the challenges and complexities associated with our current food system extend beyond the capabilities of any one individual, organization, or government. This is due to the global scope of the food system, its interconnectedness (spatial and value chains), and the influence of market forces, resource management, policy and regulation. Additionally, moving to a nature-positive food system will require behavioural change and innovation to create scaling. The latter can only be achieved through long term sustainability, making achieving a nature-positive food system a long-term endeavour and a transformative change. Collective action ensures continuity and commitment beyond the short-term interests of individual actors. Nonetheless, individual actions can also lead to nature-positive outcomes along the system. The concept of leverage points provides interesting perspectives between collective understanding and actions and the value of individual interventions. Bridging the normative elements of systems (paradigms and beliefs) and the normative positions of individual actors within an overall system seems key and preconditional for fundamental transformation of connected systems (Leventon, 2021).

Drawing on the systems literature, we also see that “Agents of change and a mix of interventions create enabling conditions that mobilise actor networks and trigger tipping points that accelerate transformative change. Importantly, there are many pathways to trigger such change, and these interact across people and places. Therefore, different mixes of interventions need to be activated and adjusted over time to ensure that the transition to nature-positive futures remains sustainable and ethical” (Mommer et al., 2022). This quote highlights that different actions need to interact to create cascading effects for change. Such interaction can only happen when there is collective understanding and action.

The need for collective action and understanding is embedded in the large diversity of stakeholders with a vested interest in the food system. Collective action underlines the need for diverse perspectives and expertise to be brought to the table. This makes it inherent to the definition of nature-positive food systems, namely the inclusion of diverse perspectives and knowledges. This includes farmers, governments, the private sector, consumers, environmental organisations, civil society, and local communities. Each group has a unique role to play, and collective understanding is essential to align objectives and strategies. Working with the diverse perspectives and knowledge also implies critically reviewing the power dynamics and stakeholders' motivations, which form decision-making and actions resulting in nature-positive food systems. Collective awareness among policymakers, scientists, and stakeholders is crucial for developing effective and sustainable agricultural and environmental policies that support nature-positive food systems (UNEP et al., 2023).

The private sector, including food producers, retailers, and agribusinesses, can significantly impact the food system. Industry players must collaborate to adopt sustainable practices, reduce environmental impacts, and prioritise biodiversity conservation (Hanh Nguyen, 2018). At the same time, consumers also play a role in nature-positive food systems. Understanding the environmental and social implications of their choices can drive demand for sustainable, nature-positive products. Consumer demand has the potential to influence industry practices (Mommer et al., 2022). Governments play a pivotal role in shaping food system policies and regulations.

An essential question arises regarding whether nature-positive practices also lead to concurrent increases in income. Income growth has a noteworthy impact on poverty reduction, potentially diminishing inequality,

provided such growth is distributed equitably (Manero et al., 2020). Inequality, often tied to resource variations such as farm size, assets, and capital, implies that only specific households can attain a sustainable living income (Waarts & Kiewisch, 2021). Therefore, research must understand the intricate dynamics among income, biodiversity/nature protection and inequality.

Local communities and indigenous peoples have valuable knowledge about sustainable land management and traditional farming practices. Collaborative efforts that involve local communities and respect their rights and knowledge are essential for nature-positive food systems (Dawson et al., 2021). NGOs and advocacy groups often work to raise awareness and drive change in food systems. Collective action among these organisations can amplify their impact and helps to advocate for more sustainable practices. International collaboration and agreements can be critical in addressing global challenges related to nature-positive food systems, such as combating deforestation or conserving biodiversity (Mommer et al., 2022; von Braun et al., 2023).

Finally, collaboration, shared knowledge, and coordinated efforts are essential to address the complex environmental, social, and economic challenges in our food systems and prioritise nature's wellbeing in decision-making processes.

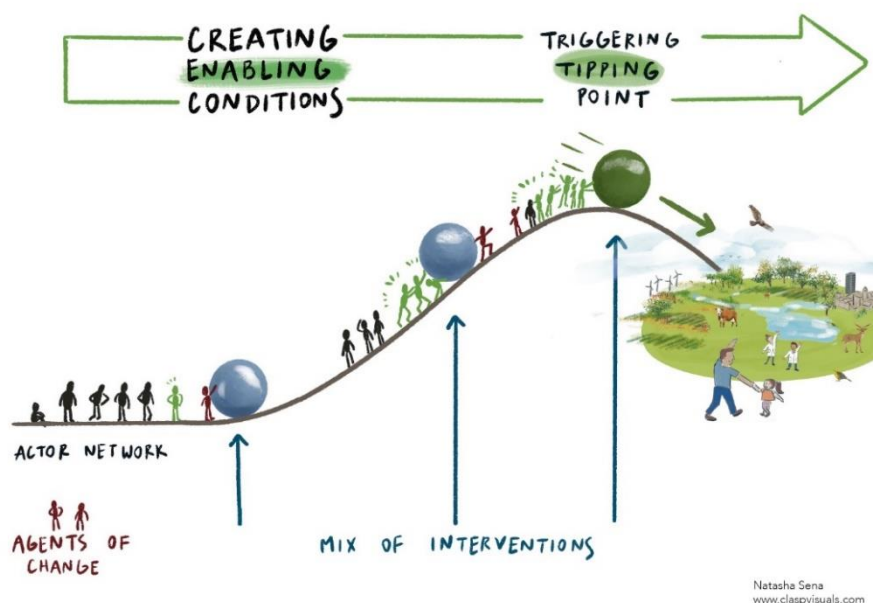


Figure 3 Copied from Mommer et al. (2022) 'Nature-positive futures. Food systems as catalyser for change.

5 What next?

The working definition and related discussions as presented here are the start of a process of understanding and discovering what nature-positive food systems could entail.

To further increase understanding and potential operationalisation, the concept is explored in case-studies in Kenya and India by learning from local stakeholders how they understand a nature-positive food system and what this could mean for them. In addition, to be able to put the concept of nature-positive food systems into practice, a set of indicators is selected and developed.

Increased understanding of 'nature-positive' in the context of food systems is a valuable step also to better embed food system change in societal transformation at large. Food system change cannot be seen, nor transformed, without its context and connectivity to other relevant societal challenges. Think of mining of valuable minerals, urban expansion, and shifting agricultural production for non-food purposes like biobased industries and energy. All of these changes and activities also have a potential effect on nature or could benefit from bringing nature to the heart of decision-making. Nature-positive food systems are part of a nature-positive world.

How this comes together and how this nature-positive world could look like is something we have to explore together. This exploration can benefit from examples from within the food system, where food production and nature are often already closely connected or the initial steps towards a nature-positive system are being made. Inspiration and experimentation will be key, together with reflexive working, debates and critical reflections. As mentioned, nature-positive food systems are not a state to work to, it is a process and a way of thinking and acting.

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Working Document



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