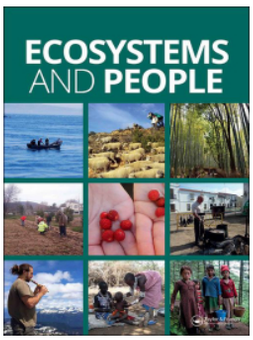

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Exploring desirable nature futures for Nationaal Park Hollandse Duinen

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ABSTRACT

Achieving global sustainability goals requires most people and societies to fundamentally revisit their relationship with nature. New approaches are called for to guide change processes towards sustainable futures that embrace the plurality of people's desired relationships with nature. This paper presents a novel approach to exploring desirable futures for nature and people that was developed through an application in Nationaal Park Hollandse Duinen in the Netherlands. This new national park is developed bottom-up by a diverse group of actors reshaping their interactions with each other and with nature. Our approach, co-designed with key stakeholders of the national park, engages with a new pluralistic framework for human-nature relationships presented by the IPBES task force on scenarios and models to catalyze the development of nature-centered scenarios. We integrated this Nature Futures Framework with the Three Horizons Framework in a participatory workshop process designed to bring people's diverse relationships with nature to the fore, and jointly envision desirable futures and the pathways to get there. We present a methodology to analyze and compare the visions and assess their potential contribution to the SDGs. We summarize the results of the application in Nationaal Park Hollandse Duinen and reflect on lessons learned. The approach successfully engaged participants in joint exploration of desirable futures for the national park based on their plural perspectives on human-nature relationships. We see much potential for its applications to support change processes in various social-ecological contexts toward more sustainable futures for nature and people.

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Introduction

Humanity has become a dominant force of change up to the planetary scale (Crutzen 2002; Steffen et al. 2015). A dreadful outcome is the wrecking of the Biosphere, despite decades of global conservation efforts. Recent global environmental assessments indicate that wildlife populations have dropped 68% on average since 1970 (WWF 2020) and one million species are at risk of extinction in the coming decades (IPBES 2019a). The future looks even more grim when considering that humanity is way off track in limiting global warming to 1.5°C (UNFCCC 2021). These global assessments univocally stress the need for deep, transformative changes in human societies and economies if internationally agreed-upon sustainability goals are to be achieved (Díaz et al. 2019; Secretariat of the Convention on Biological Diversity 2020). Indeed, supported by the present state of knowledge, human agency in the Anthropocene should be able to 'bend the curve' and create sustainable futures for people and nature (Steffen et al. 2011; Bai et al. 2016; Leclère et al. 2020).

The internationally agreed-upon target space for a sustainable development trajectory is presented by the United Nations' 2030 Agenda through its 17 interlinked Sustainable Development Goals (SDGs) and 169 associated targets – that is, *the future we want* (UN General Assembly 2012, 2015). Yet, while the Agenda 2030 is forward-looking and aspirational, there is no universal understanding of what a sustainable world for nature and people actually looks like, let alone how to get there. In fact, as people in different places and contexts around the world experience, depend on, and relate to nature in many different ways, opening-up for pluralistic perspectives on *the futures we want* is imperative. What is clear, however, is that most people and societies need to fundamentally revisit their relationships with nature and each other. New ideas, visions and

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narratives of people-nature relationships are urgently needed to enact transformative change towards just and sustainable futures (Bai et al. 2016; Bennett et al. 2021; Wyborn et al. 2021).

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is actively supporting the development of new narratives of desirable nature futures around the world. Building on the findings of the IPBES Thematic Assessment on Scenarios and Models (IPBES 2016), the IPBES Task Force on Scenarios and Models is mandated to catalyze the development of new nature-centered multi-scale scenarios that are based on positive visions for human relationships with nature (IPBES 2019b). An important outcome so far is the development of the Nature Futures Framework (NFF) as a foundation for developing scenarios of positive futures for nature and people. The NFF places diverse relationships between people and nature at its core. It provides a heuristic tool for the collaborative creation of visions and narratives while it simultaneously offers structure for consistency in the development of nature scenarios across multiple scales and diverse contexts (Pereira et al. 2020). Place-based applications of the NFF may i) provide insights into commonalities and divergences across desired visions of nature around the world and their translation into goals and targets, ii) identify scalable policies and actions that enable pathways towards these desired futures, and iii) develop more diverse sets of indicators that reflect these visions and pathways, and the diversity of value perspectives which they represent, to assess progress along these pathways (Pereira et al. 2020). Currently, there is an articulated need to extend the use of the NFF in real-world case studies to operationalize it globally and to drive an inductive process to develop and refine a family of new nature-centered scenarios (Rosa et al. 2017; IPBES 2019b; Pereira et al. 2020).

At the same time, promising initiatives that seek to transform the way humans interact with nature are already happening 'on the ground'. A notable example where new narratives are being explored is the bottom-up development process of Nationaal Park Hollandse Duinen (NPHD) in the Netherlands. The ambition of this new national park is to be a showcase of how people and nature can co-exist (NPHD 2017, 2020a). With a surface area of ~450 km^2, the national park covers the entire coastline of the province of Zuid Holland, including sea, beaches, dunes, forests, agriculture, urban infrastructure and over a million inhabitants (Veenstra 2020). The geo-morphological foundation was laid 5000 years ago and the interacting forces of nature and humans have shaped this landscape ever since, resulting in exceptional socioeconomic, cultural and ecological values (Van Heeringen and Van der Velde 2017; Neefjes 2018). Current pressures however, including various forms of pollution, urbanization, climate change and sea level rise, are interacting and mounting. A group of local and regional actors recognized that, in the Anthropocene, maintaining the unique landscape qualities and values requires an integrated and collaborative effort that actively engages with the social-ecological complexity and dynamism of the landscape. They initiated a national park, aiming to 'reinforce the quality and resilience of both natural and cultural heritage in the landscape of the park by empowering people and organizations to create synergy between natural processes and human activities' (NPHD 2017). Thus, rather than through strict protection, this national park seeks to safeguard and even enhance biodiversity values through an inclusive approach rooted in social-ecological systems thinking (Palomo et al. 2014; Cumming et al. 2015; Cumming and Allen 2017). Yet, to realize its aim and mission, NPHD faces a daunting change process involving numerous actors, interests and desires.

The SDGs, the NFF, and NPHD can be seen as three distinct developments stemming from the same philosophy to reconfigure people-nature interactions towards the mutual benefit and sustenance of all, that is, towards attaining *the futures we want*. As such, a pertinent question is how these developments may be synergistically combined to purposefully inform and reinforce each other towards that common aim, also speaking to a broader challenge of useful integration of approaches in sustainability research (Lang et al. 2012). In this paper, we present an innovative approach to explore desirable nature futures, consisting of a participatory workshop process and analyses of the outputs. We developed the approach through an application in the NPHD. The workshop process strategically links the NFF to the Three Horizons Framework (Sharpe et al. 2016) to capture diverse perspectives on relationships between people and nature and develop the capacity of stakeholders of NPHD to envision desirable futures and explore transformative changes to get there. The analysis of the content of the workshop outputs consists of a thematic analysis and an SDG Target analysis to better understand the emerging visions and their potential contribution to sustainable development. The overarching aim of this study is twofold: test the NFF at the regional scale and inform the development trajectory of NPHD. The latter includes the potential to develop insights for achieving the SDGs.

We first give a detailed recipe of the workshop process including an introduction of the core frameworks used. We then present the steps of the analysis and report the results of the approach. In the discussion we reflect on the outcomes and discuss how the outcomes may feed into both the broader development process of the national park as well as the inductive scenario development process catalyzed by IPBES.

Materials and methods

Background

Nationaal Park Hollandse Duinen

NPHD was created in 2016, when drinking water company Dunea brought together 45 parties in the area to participate in the 'Most Beautiful Nature Area of the Netherlands' election (NPHD 2017). This participation – and the election as one of the three most beautiful nature areas by the Dutch public – initiated the development process of one of the first Dutch 'new style' national parks: large areas where high biodiversity, cultural-heritage and socio-economic values co-exist and even reinforce each other (Nationaal Parken Bureau 2018; NPHD 2020a). The ecosystems of NPHD are heavily influenced by humans, if not entirely shaped by them (Neefjes 2018), and yet no less than 6974 species were counted by a citizen science project in the natural areas of the park (https://hollandseduinen.waarneming.nl/5000.php). An example of how nature and people work together is the protection and management of a dune area by Dunea for provisioning of ecosystem services, focused on the natural filtration and storage of fresh water to provide 1.3 million people with tap water. The human-inclusive approach to conservation developed in NPHD builds on a long tradition of integrated landscape approaches in Europe, such as the superseded 'National Landscapes' (Janssen 2009a, 2009b; Janssen and Knippenberg 2012), and shares common grounds with UNESCO Biosphere Reserves (Winkler 2019), IUCN category V 'protected landscape or seascape' (Borrini-Feyerabend et al. 2013), and urban national parks (Roe et al. 2018), such as the London National Park City and Stockholm Royal National City Park. Convened by NPHD, local actors can work together to enhance biodiversity values by strengthening ecological connectivity in the landscape; resolving scale mismatches; enhancing landscape multifunctionality; alleviate existing trade-offs between nature and human well-being; and bolster the co-benefits of integrated strategies. This may be achieved by aligning fragmented management and planning practices; mobilizing investments in green infrastructure and nature-based adaptation; promoting polycentric governance; forging unconventional alliances across sectors; and facilitating experimentation to challenge conventional practices (e.g. through 'living labs'). Twelve concrete projects are presented in the implementation program 2021–2025 (NPHD 2020b)

The Nature Futures Framework

The NFF presents a heuristic tool that provides a starting point for creating diverse nature-centered scenarios. The framework engages people's values of nature and their relationship to nature for the creation of narratives that can be translated into collective action (Pereira et al. 2020). It distinguishes three broad value perspectives of nature (Figure 1):

- *Nature for Nature*, in which nature has value in and of itself. Nature should maintain its ability to function autonomously, and the preservation of nature's diversity and functions is of primary importance;
- *Nature for Society*, in which nature is primarily valued for the benefits for humans;
- *Nature as Culture*, in which humans are perceived as an integral part of nature, where societies, cultures, traditions and faiths are intricately intertwined with nature, and relational values, such as those reflecting cultural identities and ways of life, are dominant.

The NFF draws on other classifications of people-nature relationships. For example, Mace (2014) describes four main phases in the modern framing of nature conservation: *Nature for itself, Nature despite people, Nature for people, People and nature*; Chan et al. (2016) present three key value types underlying nature conservation as *instrumental, intrinsic and relational*, which are also central to IPBES' guide on multiple values (IPBES 2015). The NFF casts these ideas into three value perspectives that are easy to communicate to a wide audience and positions them in the vertices of a triangular space (Figure 1(a)). In that way the value perspectives draw attention for being different, without judgment of rightness or wrongness, but emphasizing that when taken to the extreme, tradeoffs among these value perspectives are inevitable. At the same time, the interior space opens-up for the discovery of diversity, relativity and plurality. Indeed, most people will identify with a mix of the three value perspectives.

The development of the NNF is driven by IPBES' task force on Scenarios and Models through an iterative process involving strong stakeholder engagement (Pereira et al. 2020). The underlying mandate is to catalyze the development and application of new nature-centered scenarios and models by the broader research community to, ultimately, better inform upcoming assessment reports (IPBES 2019b). The NFF is envisaged to be used flexibly and in different ways, from structuring participatory visioning processes, to quantitative modeling assessments, and ex-post assessments of existing scenarios (IPBES 2021). We focus on unpacking the NFF as a heuristic device for participatory visioning processes. A key promise of this framework is to help people identify and articulate their own desired relationship with nature (as value expressions), understand the diversity and plurality of people's value perspectives of nature, and identify and negotiate shared values as fertile grounds for collective actions towards positive futures in which multiple nature values are enhanced (Pereira et al. 2020). In many

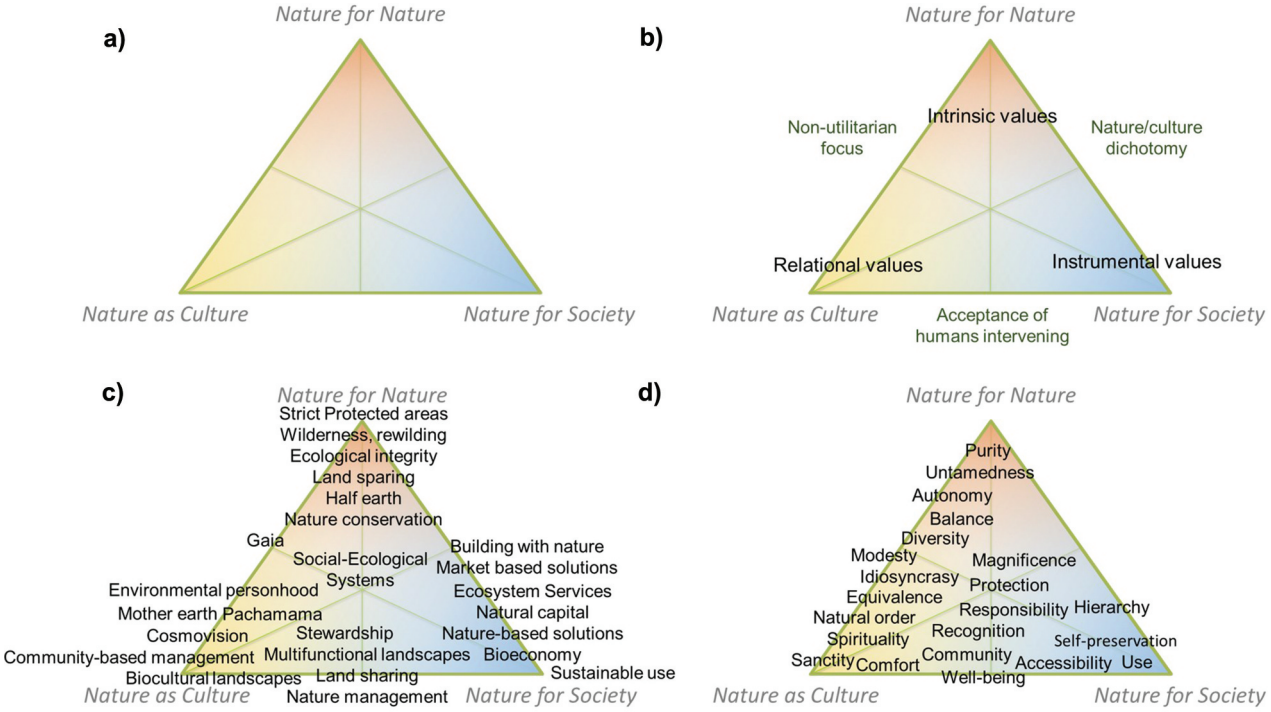


Figure 1. The basic structure of the NFF (a) as during the time of the workshop, as well as three annotated versions (b-d) as presented to the participants to provide additional explanation of the framework to help them understand how it may be interpreted and used. The NFF presents a triangular space (a) with vertices representing three main value perspectives on people nature relationships: Nature for Nature (NfN), Nature for Society (NfS) and Nature as Culture (NaC). It accommodates three key value types identified by the IPBES guidance on multiple values of nature: relational values, instrumental values and intrinsic values (b). These three values do not map unequivocally to the three perspectives, allowing for their coexistence. For example, besides intrinsic value of nature (NfN), the reciprocal relationship of people and nature may have intrinsic value as well (NaC). But on an abstract level these value types help interpret the altitudes and therewith fundamental differences between the vertices. Furthermore, we briefly showed (c) how examples of popular concepts discussed in contemporary conservation may be mapped on the NFF, and (d) how the NFF may be populated with a broader set of nature values identified by De Argumentenfabriek (2013). Note that the interpretation, presentation and use of the NFF in this paper is independent from IPBES.

cases it will be difficult for people to agree on tough decisions about how they engage with nature in the present. It may be easier to jointly deliberate and agree on desired relationships with nature in the future, as a basis for making decisions in the present. This is where the NFF is expected to be useful.

The Three Horizons Framework

The Three Horizons framework is a tool for collaboratively exploring the future. It is a graphical approach where stakeholders are invited to discuss future visions and pathways to achieve them (Curry and Hodgson 2008; Sharpe et al. 2016). It is most applicable in cases of high uncertainty and high agency, in which participants can be creative agents, capable of influencing which future emerges around them. The three horizons present a metaphor to help people consider near, medium, and long term futures. Beyond just a linear view, the three horizons represent three different ways of relating to the future in the present, thereby welcoming people with very different views on the future (e.g. managerial, entrepreneurial, or visionary mindsets). The underlying theory of change looks at how existing dominant patterns and paradigms of the 'first horizon' (the world as it is now) could shift to fundamentally new patterns of the 'third horizon' (the desired future) – through a period of innovation, contestation and transition in the 'second horizon', thereby scaffolding discussions about transformative change (Sharpe et al. 2016). The Three Horizons approach has been used in various contexts, including pathways for achieving the SDGs (Aguiar et al. 2020) and the Life Framework of Values that is also used within IPBES (Harmáčková et al. 2021).

The Sustainable Development Goals

The SDGs of the Agenda 2030 for Sustainable Development are a collection of 17 goals, presenting 'the blueprint to achieve a better and more sustainable future for all'. They were adopted by all UN Member States in 2015 and should be achieved by 2030. The SDGs are presented as integrated and indivisible, to prevent the occurrence of tradeoffs that hinder progress across the full set. The SDGs are operationalized through 169 associated targets (see sdgs.un.org/goals).

The nature futures of NPHD workshop process

We designed a participatory futures process in NPHD for stakeholders to explore positive futures for nature,

based on diverse desirable relationships with nature. The workshop was collaboratively designed and prepared by a transdisciplinary research team of researchers from diverse backgrounds, including geography, political science, ecology, sustainability science, and the director of the national park. We applied this process during a full day workshop in the dune landscape of the NPHD on 17 June 2019. Our process strategically integrates the NFF (Pereira et al. 2020), to *open-up* people's thinking about desired people-nature relations, with the Three Horizons Framework (Sharpe et al. 2016) to *focus* people's thinking about desired people-nature relations into three distinct time horizons, and how these time horizons might influence each other. The process was inspired by the workshop process of the Seeds of the Good Anthropocene project as described by Pereira et al. (2017).

Participant selection and preparation

A group of 23 key stake- and knowledge holders of the NPHD participated. They were selected and invited by the NPHD director and represented a diversity of professional backgrounds (Appendix A). During the workshop participants were divided into three groups of approximately 7 people. We mostly let groups self-organize but asked some participants to switch in order to maximize diversity within groups, to stimulate discussion and, ultimately, create rich, diverse visions of the future. In the invitation to the workshop, the aims and background of the project were explained, and participants were given a brief overview of the workshop phases (see Appendix B). We tried to avoid giving too much information to prevent biasing the participants' views and expectations.

Facilitation

An organizing researcher facilitated the process in each group, supported by a note taker. Additionally, one experienced facilitator oversaw all groups to jump in when necessary and to ensure they made similar progress. For the interactive group work, we prepared A1-sized sheets with depictions of the basic structures of the NFF and the Three Horizons Framework. Participants captured their input by placing sticky notes on these diagrams. The facilitators encouraged discussions but did not push for consensus as to allow for plurality (Turnhout et al. 2020). The goal was to let a rich picture emerge that helps stakeholders understand and respect the diversity of perspectives held by the different stakeholders and which can be further unpacked. Participants did not include their names so that the output became a group product. Throughout the process, participants were encouraged to cluster sticky notes thematically to facilitate joint sense-making. The process facilitators were supported by a graphic facilitator who created illustrations capturing the outputs of the group work throughout the workshop process for all participants to see. The Chatham House Rule was applied to promote a safe environment for creativity and inspiration. Under the Chatham House rule participants are free to share the information they receive, but are not allowed to reveal the identity of who said it, nor that of any other participant (Heath-Brown 2015). The lunch break was combined with a walk through the dune landscape to help participants connect with nature and each other.

Workshop process

The process consisted of six distinct phases.

Phase 1: introductions and setting the scene. The workshop started with an icebreaker exercise that was designed to inspire. In the workshop invitation, participants were asked to bring a picture or other type of object capturing or representing a strong personal relationship with nature. During the introductions, participants were asked to introduce themselves based on what they brought. The goal was to nurture a positive and nature-oriented mindset and already get a sense of the diversity of relationships held by the participants. Also, avoiding introductions based on which organization people represent may help build a safe environment for creativity and out-of-the box thinking. After the introductions the participants split into three parallel sub-groups.

Phase 2: annotating and unpacking the nature futures framework. Each of the participants was asked to position their picture or object on the triangular space of the NNF and explain that position to their group members. Populating and discussing the triangular space aimed to open-up a plurality of value perspectives and create a rich value foundation for the visioning. The facilitators asked the following questions: *Why is nature in NPHD important for you? Where in the triangle do you belong, which value perspective do you identify yourself with?* Thereafter, participants were asked to place additional perspectives using sticky notes, either representing themselves or the organization they represent. We asked: *Why is nature important for the people you represent? Which groups of people may identify themselves with which parts of the triangle?* Subsequently, the subgroups reflected on which areas of the triangle were populated and which were still open, to check which perspectives might be missing, to discuss multiple values for nature. We asked: *Is the entire triangle populated? What are shared and connecting values? Where are the gaps? Are there perspectives missing?*

Phase 3: third horizon. The third phase focused on the third horizon, that is, a desirable future (a system we want to transform to). The goal was to imagine elements of positive futures for people and nature in NPHD (Figure 2(a)). The facilitators asked the participants: *What does a desirable future of NPHD look like, if we project our (shared) nature values onto the future?* To ground the envisioned futures in the present world, we asked: *What are pockets of the future in the present, or 'seeds' that have the potential to sprout and grow a desirable future.* After several rounds of adding elements, we used a prompt to help participants synthesize and cast their diverse imaginations into sets of keywords in the form of newspaper headlines. We asked: *Imagine and formulate a future newspaper headline about Nationaal Park Hollandse Duinen. What does it say?* The headlines provided useful input for the graphic facilitator.

Phase 4: first horizon. The fourth phase focused on an assessment of the current system, that is, the first horizon. What are things people cherish and want to maintain into the future, what needs to grow, and what needs to be phased out (Figure 2(b)). Questions asked to the groups were: *What in the current area of NPHD contributes to, impedes, and needs to develop to create desirable futures for NPHD?* Different colors of sticky notes were used to differentiate desirable features from undesirable features. New and promising policies and plans that have come into effect but are too new to have had any effect are mapped onto the middle of the first horizon, as a lead-up to the second horizon. Additionally, we encouraged participants to think of more seeds in the present, and agree on three seeds that are considered particularly promising for growing the third horizon, which were captured by the graphic facilitator.

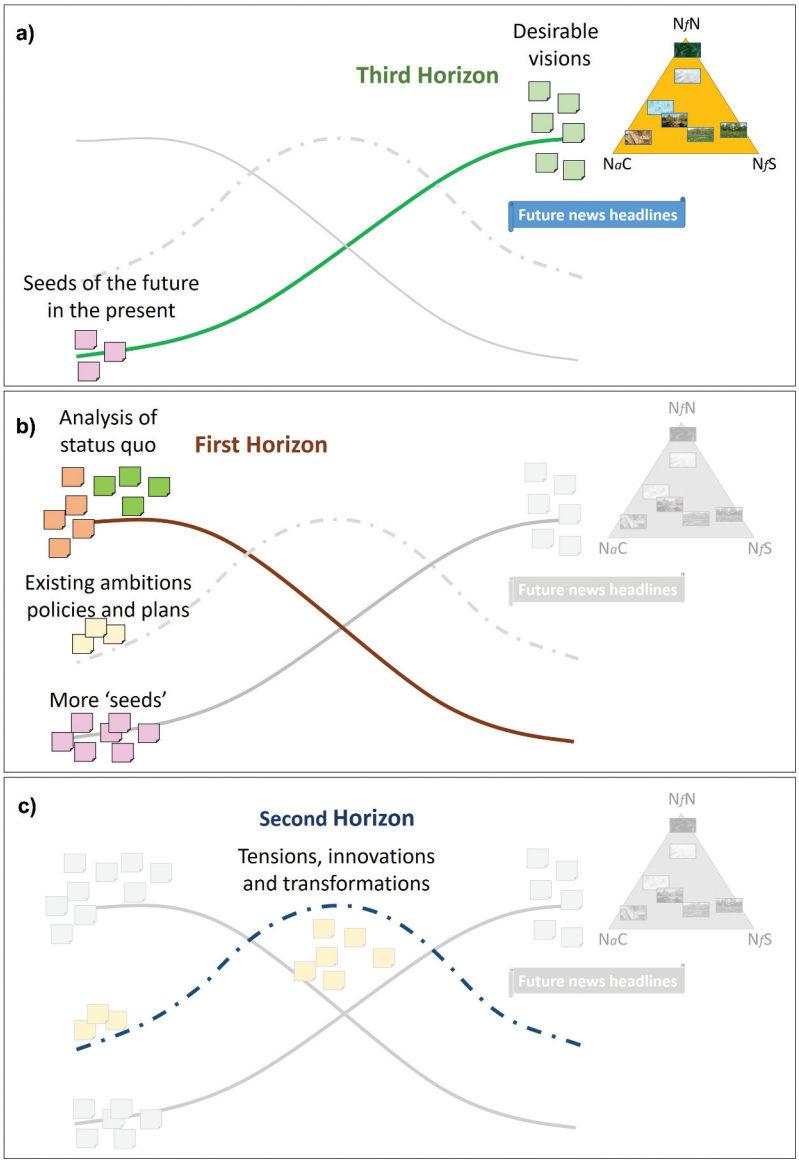


Figure 2. A depiction of the three phases of the workshop focused on the three horizons. a) Phase 3 focused on the Third horizon. b) Phase 4 focused on the First Horizon. c) Phase 5 focused on the Second horizon. On the x-axis is time, without units, and on the y-axis is 'dominant patterns', without units.

Phase 5: second horizon. The fifth phase focused on the transitional space and thinking about enabling actions, that is, the second horizon (Figure 2(c)). Questions asked to the groups were: *What needs to happen to transition from the present towards the desired futures? Which innovations are going to be game changers in the near future and play a role in the transitions? Where will the main tensions and contestations arise? Can we identify synergies between nature values, innovations and seeds?* The emerging discussion then naturally converged into a few key talking points. We asked the groups to come up with a group name representing these defining issues, as well as three key words.

Phase 6: Group Presentations and Plenary reflections. During the final phase the groups presented their main outcomes to each other, using their sheets and the artwork of the graphic facilitator. This was followed by a plenary reflection and discussion for joint sense making and identifying possible follow-up steps using a semi-free format. The questions we used to guide the discussion were: *What did the participants learn? What are lessons for NPHD? What will the participants take back to their organizations? What are follow-up steps?* The discussion was moderated by the director of the national park.

Analysis

The analyses described here focus on the co-produced group outputs for the third horizon, which sketch a coarse vision of a desirable future of the national park. We present a thematic analysis and an SDG Target analysis of these visions.

Thematic analysis

Developing a thematic structure to present the envisioned futures for NPHD in the third horizon helps with ex-post sense-making of the content produced within sub-groups as well as comparison across sub-groups. Such structured comparison facilitates identification of commonalities as well as differences and divergences, which may point to consensus and disagreement across the stakeholders about the future of NPHD. Additionally, it facilitates cross-case comparison with other bottom-up scenario processes using a similar structure and the uptake of the content into the inductive scenario development process of new global nature scenarios for IPBES based on case studies from across the world (Pereira et al. 2020).

After the workshop we entered transcripts of the sticky notes from the annotated participatory diagrams into a spreadsheet database. Then, for each of the groups, we organized the entries into thematic categories. To do so, we first checked for clusters of sticky notes created by the participants themselves during the workshop process. Notes from the subgroup discussions guided interpretation of post-it transcripts and emergent clusters. Additionally, we looked at thematic categories that emerged from a pilot application of the NFF in Brazil (Rana et al. 2020) as well as a narrative building workshop by the IPBES Task Force on Scenarios and Models (PBL 2020) and adopted relevant categories to complement or merge with the previously identified categories. This was to start to develop some level of consistency between various case studies that use the NFF. It is envisaged that with each iteration, a final group of categories that are relevant across different contexts and cases will emerge.

SDG target analysis

The SDGs provide humanity with a target space for sustainable development. Thus, arguably, the SDG targets represent the internationally agreed third Horizon of the world. As such, they may be compared with the third horizon for NPHD to assess how the envisioned futures of NPHD may help achieve the international vision for sustainable development as portrayed by SDGs, and vice versa.

Content analysis. We inspected each of the 169 SDG Targets. Two researchers assessed which of the targets are relevant for NPHD, first without reference to the workshop outputs. This presented a potential SDG space against which the results of the outputs of the workshop process could be compared. Next, following Jiménez-Aceituno et al. (2020), we used content analysis to identify the SDGs and related targets addressed by the sticky notes that shaped the third horizons generated by the workshop process. The sticky notes of the third horizon provided the sampling units, the expressions on the sticky notes provided the data collection units, and the SDG targets were the units of analysis. For each of the sticky notes we checked whether they met each one of the 169 SDG targets in an iterative process of coding and re-examining. Additionally, for each of the sticky notes, we selected one Goal that was most relevant (see Appendix C for an example and additional details on the method).

Descriptive analysis. We used descriptive statistics to explore which SDGs, and how many of the SDG targets were addressed by the sticky notes that shaped the third horizon for NPHD. These targets may be used to discuss the potential of NPHD to contribute to the Agenda 2030 if the visions would give direction to the development process. Subsequently, we identified which of the SDG targets that, *a-priori*, were considered by the researchers to correspond with the mission of NPHD did not appear in the broad visions for NPHD produced during the workshop process. These targets may be discussed as

unrecognized potential of NPHD to contribute to the Agenda 2030.

Results

The nature futures of NPHD workshop process

Uncovering the plurality of value perspectives on human-nature relationships

Stakeholders expressed diverse relationships with nature during step 1 and 2 of the workshop process. In all groups the triangular spaces of the NFF were abundantly populated by photos, objects and descriptions expressing people's relationships with nature. These items, 81 in total across all groups, were mapped all over the triangular framework spaces. Most of the items that were placed in the vertices of the triangle were not positioned in the very extremes. Not every participant immediately understood the *Nature as Culture* value perspective, and how it differed from *Nature for Society*. However, confusions were resolved quickly after discussing a few different examples. Eventually, relatively few expressions were attributed to the *Nature for Nature* perspective. Although spread out, the density of expressions was highest in the direction of Nature for Society. Not all contributions could be translated into text, but examples from the written expressions were: 'Natural dynamics', 'Cycle of life' and 'Intrinsic value' for the *Nature for Nature* perspective; 'Food production', 'Relaxation' and 'Recreation' for the *Nature for Society* perspective, and 'Identity', 'Part of nature' and 'Cultural landscape heritage' for the *Nature as Culture* perspective. Examples from the center space were: 'Provides a memory', 'Provides a mirror', 'Puts human existence into perspective' and 'Wonderment'.

Group visioning process

Rooted in the elicitation and discussion of values associated with nature, phase 3, 4 and 5 produced rich discussion about desirable futures for NPHD and the transitions needed to get there. Table 1 summarizes the main features of the three groups in which these discussions are reflected. We present the inputs for the third horizon in Table 2, and for the first horizon in Appendix D Table A1. The illustrations created by the graphic facilitator are presented in Appendix E.

While all the groups discussed each of the three time horizons, the groups differed in which horizon was explored the most. 'How Green is Red?' and 'Our park Hollandse Duinen' focused mostly on discussing the future of NPHD in the third horizon, while 'The Bridge Builders' left the third horizon more open but spent relatively more time unpacking the first Horizon to identify what needs to remain and what needs to change. The second horizon was least explored. The second horizon was also used strategically to park major trade-offs or taboo's that need to be addressed at some point but could not be solved during the workshop discussion. Examples are intensive agriculture, what is fair distribution and allocation of scarce space, and whether or not the national park should engage with behavioral change.

Plenary discussion and synthesis

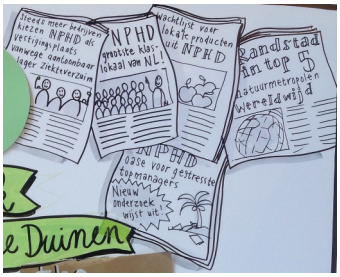
The plenary discussion during the final step of the process highlighted several cross-cutting factors. Multiple participants mentioned that the large scale of NPHD with multiple functions offers opportunities to collaborate on shared goals, but more effort needs to go into identifying and taking away fundamental barriers. The participants articulated the need to identify a shared set of key values and principles to self-organize their collective efforts, like 'a swarm of starlings', or the 'DNA of NPHD', without compromising on the richness and diversity of nature values that can be found in the national park. A pertinent follow-up question that was brought up is how to monitor progress and success. At the end of the workshop we asked people what they would like for a follow-up workshop. Some participants expressed the desire to have more time to continue unfinished discussions or to talk and work more towards concrete actions. For example, someone said: 'now we need to get more concrete; now we need maps and start drawing'.

Thematic analysis

We identified 9 thematic categories to present the output generated during the exploration of the third horizon (Table 2). These categories emerged through comparing and integrating clusters made by participants with the thematic categories presented by other applications of the NFF (PBL 2020; Rana et al. 2020).

The structuring shows that the produced outputs for the third horizon cover various fundamental features of societies and social-ecological systems, serving as ingredients for an integrative narrative of a desirable vision of the future for NPHD. The structuring also reveals plurality within the groups, as the emerging narratives embed a mix of people-nature relationships. Some apparent trade-offs occur within the groups. For example, in 'Green is Red', the landscape supports businesses and food production but also natural dynamics. Various consistencies across the groups can be found, such as the focus on health, the contribution to the local economy and the presence of agriculture. No striking divergences occur across the groups, although it must be noted here that such comparison is limited by the amount of content, especially for the 'The bridge builders' who focused

Table 1. Names, sticky notes on the three horizons diagram, keywords and headlines of the three subgroups.

Group name	*How Green is Red? (Said The Colorblind)* (referring to the colors of natural and built surface on spatial maps)	*The Bridge Builders*	*Our Park Hollandse Duinen*
Nr of sticky notes	*H3: 32* *H2: 14* *H1: 20* *Seeds: 19*	*H3: 9* *H2: 10* *H1: 34* *Seeds: 14*	*H3: 31* *H2: 16* *H1: 34* *Seeds: 27*
Key words	• *Integrated systems thinking* • *From € to value(s)* • *Perspective*	• *Connectedness* • *Future-proof* • *Diversity*	• *Oasis* • *Pride* • *Nature metropolis*
Third horizon newspaper headlines	 *'10.000th species observed in NPHD'* *'NPHD doubles in size!'* *'Agriculture NPHD 100% pesticide free'* *'One millionth volunteer active for NPHD'* *'Queen's speech: Queen Amalia praises NPHD for broad value creation'*	 *'A visit to NPHD makes you years younger!'* *'NPHD is a cradle for new ideas'*	 *'Waiting list for local produce from NPHD'* *'NPHD biggest class room of the Netherlands!'* *'NPHD an oasis for stressed CEO's new research shows'* *'The conurbation of Western Holland in global top-5 nature-metropolises'* *'More and more businesses settle in NPHD due to demonstrably lower absenteeism'*

more on unpacking the first horizon (Appendix D Table A1).

SDG Target analysis

Assigning one most relevant SDG to each of the sticky notes of the third horizon shows that, across all groups, three goals stand out: Goal 11 (Sustainable cities and communities; 21% of the sampling units), Goal 15 (Life on land; 18%) and Goal 8 (Decent work and economic growth; 15%). All but three SDGs were represented: Goal 1 (No Poverty), Goal 5 (Gender Equality), and Goal 10 (Reducing Inequality).

Coding the 72 sticky notes for the SDG targets resulted in 236 scores. We found that 56 of the 196 SDG targets were represented at least once (Figure 3). There are 7 targets that we observed in our sample at least 10 times: Target 8.4 (Improve resource efficiency and endeavour to decouple economic growth from environmental degradation); Target 11.4 (Protect and safeguard the world's cultural and natural heritage); Target 11.7 (Safe and inclusive green and public spaces); Target 11.a (Positive economic, social and environmental links between urban, peri-urban and rural areas); Target 15.1 (Conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services); Target 15.5 (Reduce degradation of natural habitats, halt the loss of biodiversity, protect and prevent the extinction of threatened species); Target 15.9 (Integrate ecosystems and biodiversity values into national and local planning, development strategies, and accounts).

The distribution of all the scored targets across our sample confirms the pattern at the SDG level that Goal 11, 15 and 8 stand out, and that Goal 1, 5 and 10 are not represented (Figure 4).

We identified only a few SDG targets that were considered relevant for NPHD during the a-priori assessment but which were not explicitly brought up by the participants during the workshop (Figure 3). These are targets: 1.5; 2.1; 3.3; 3.D; 4.a; 5.5; 6.a; 8.5; 10.3; 10.7; 12.6; 14.1; 15.7; 16.b.

Discussion

Working on sustainable development of the biosphere, whether it is towards desired futures of local environments or achieving international goals, requires action-oriented approaches that are pluralistic and integrated (Bai et al. 2016; Jacobs et al. 2020; Caniglia et al. 2021). We present a novel approach to exploring desirable nature futures and what it takes to get there, that we applied in Nationaal Park Hollandse Duinen. Our aim was to test the NFF at the regional scale and inform the development trajectory of NPHD. Here, we reflect on what we learned by applying the approach and present pointers to future research.

Table 2. Output on the third horizon for the three groups organized around themes. We merged some duplicants and clarified or shortened some of the descriptions for a concise presentation in this table.

Group / Themes	1 – How Green is Red?	2 – The Bridge builders	3 – Our Park Hollandse Duinen
Spatial planning; Landscape, urban, infrastructure design.	Cities are embedded in nature. High-rise buildings in cities with a lot of nature in and surrounding the city. Private and communal gardens contribute to nature and are part of NPHD. Ample opportunities for biking, running and strolling. Resilience and flexibility is built into the system.	Highly diverse landscape.	High landscape qualities. People can experience NPHD as their garden, and find the ultimate nature experience, including wild camping. Less segregation of nature/ landscape and the built environment. Only buildings that are sustainable and that fit into the landscape. Better accessibility of the area. Many entrances and opportunities for living and working.
Governance, Policy, Regulations.	Fragmentation of management/policies in the landscape is reduced. Sufficient financial resources are made available for management. Tourism is regulated and curbed.		All municipalities in NPHD work together. Tourism and recreation is regulated. NPHD is politically independent of economic interests. Political interests are aligned with the long-term vision of NPHD.
Agriculture and production from land.	NPHD is a life support system for its residents. All food is produced locally or regionally. Free of pesticides. Forests provide wood for buildings. Houses and buildings have greenhouses contributing to efficient decentralized food production.	Organic agriculture, including bulb cultivation.	High demand for local produce.
Economy, trade and transport.	Circular economy. Nature is valued properly. Negative externalities are internalized. The contribution of NPHD to the local economy is well recognized. Farmers receive a fair price that allows for inclusive agriculture.		NPHD is important for the regional economy and provides a source of income. The recreation sector invests in the area.
Technology and Nature Based Solutions.		Cradle of new ideas and innovation.	Nature is a source for biomimicry. Nature provides opportunities for research. Soundless and clean cars and airplanes. Nature based solutions.
Energy.	The area of the NP is carbon neutral.		The area is a source of renewable energy. These energy sources (wind, solar) are designed to fit in with the landscape.
Biodiversity and nature management.	High biodiversity. Ecological connectivity. Natural dynamics. Both 'old' and 'novel' ecosystems are valued in their own right. Apex predators provide top down control of ecological dynamics. Sand dune ridges are restored. The landscape is managed to provide opportunity for businesses.	Nature is connected.	Abundant nature. A lot of flowering flora. A lot of fauna.
Livability, health, environment and well-being.	Clean air. Healthy living environment. NPHD offers quietness and silent areas for resting. Climate proof	Healthy living environment. Clean land and water. Keeps people young.	Quietness. Tranquility. Low disease and stress among residents and employees.
Social structure, community participation, behavior, norms, education, awareness.	Voluntary work is widely practiced.	People are connected with nature. People know their environment.	People feel connected with the landscape. Children play and learn in nature. Awareness of the diversity and plurality of people-nature interactions.
Culture and heritage.	Natural heritage (sand ridges) and cultural history (including references to the roman empire) are recognizable in the landscape.	A place where new stories are told. Layered landscape, connecting history with the future.	The landscape represents people's identity.

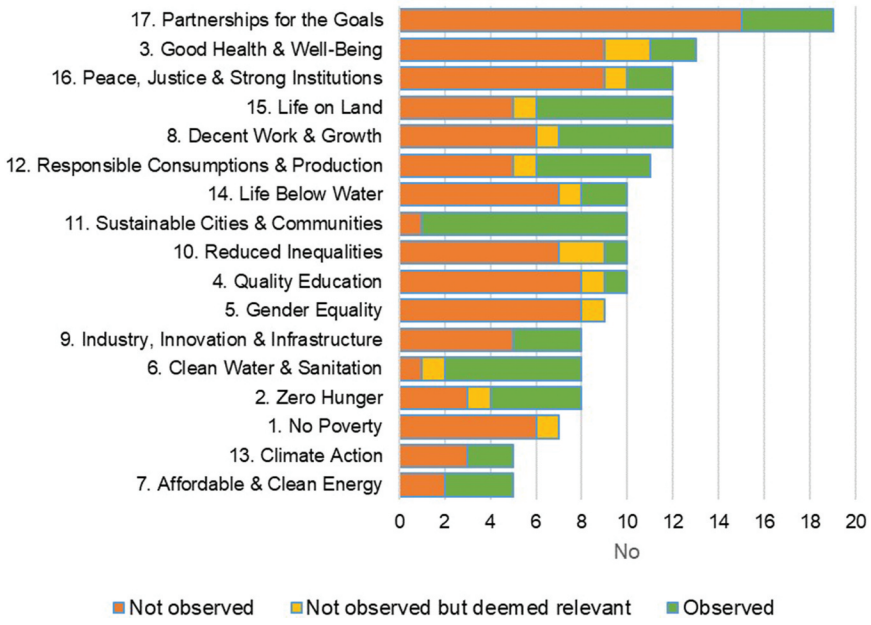


Figure 3. Number of targets under a specific SDG, and the distribution of targets appearing in our sample (Observed), the number of targets that do not appear in our sample (Not observed), and the targets that do not occur but were identified as potentially relevant for NPHD during an a-priori assessment (Not observed but deemed relevant). For example, SDG 17 has 19 targets. 4 of these targets appear in our sample, while 15 targets are not represented.

A values-based approach

As people's decisions and actions are underpinned by their values, the role of values in sustainability transformation is increasingly discussed (Bieling et al. 2020), whereby plural valuation is recognized as key for inclusive and fair decision making (Muradian and Pascual 2018; Jacobs et al. 2020; Hensler et al. 2021). Despite recent calls to integrate values in social-ecological scenarios (e.g. Oteros-Rozas et al. 2015), approaches that show how people's values, and their combinations, may drive the unfolding of the future remain scarce (Harmáčková et al. 2021). The NFF proved an easy to use tool for eliciting and discussing diverse and plural appreciations of nature as a basis for a place-based visioning process. We therefore see our approach a useful addition to the diversity of available scenario approaches grappling with nature's values.

Certainly, it can be challenging to work with values, particularly in participatory settings, given their abstract and multifaceted nature. Rawluk et al. (2018) defined value-based scenarios as tangible imaginings of how abstract values might be expressed in planning and management, and developed a participatory approach to explore core values and tensions, based on Schwartz' (2012) theory of basic values and the 2 × 2 matrix for producing contrasting scenarios. Common with our approach is that participants are enabled to reflect on their own values and how they differ from others, and may come to expression in the future, but their final scenarios focused on a few key values rather than engaging with a plurality of values.

We acknowledge that more conventional participatory scenario approaches often do engage with values, but position them less centrally. For example, as part of sustainable development planning in the Bahamas, Wyatt et al. (2021) used participatory mapping to surface what people value in the current system, as well as their hopes and desires for the future. But this information was merged with information on environmental stressors, key habitats and important activities to create four contrasting regional development scenarios that were used to assess impacts on nature and its contribution to people.

An approach most similar to ours, especially in terms of engaging with nature's values to discuss pathways is presented by Harmáčková et al. (2021) who developed a values-based scenario approach integrating the Life Framework of Values (O'Connor and Kenter 2019) with the 3 Horizons Framework. Their approach, developed through a series of engagements in protected areas in Czechia, dug deeper into actions (as future pathway elements) to connect participants' values to future impacts. Hence, the third horizon was approached more as a future image that emerges from these impacts rather than a desirable vision *per se*.

Another difference with the study by Harmáčková et al. (2021) is the values taxonomy used to provide entry points for eliciting and discussing values and value plurality. The Life Framework of Values differentiates four 'Life frames' of *living from, in, with* and *as the world*. Arguably, the NFF captures the *living in* and *living as* frames under the *Nature as Culture* perspective. The four framings by Mace (2014) provide yet

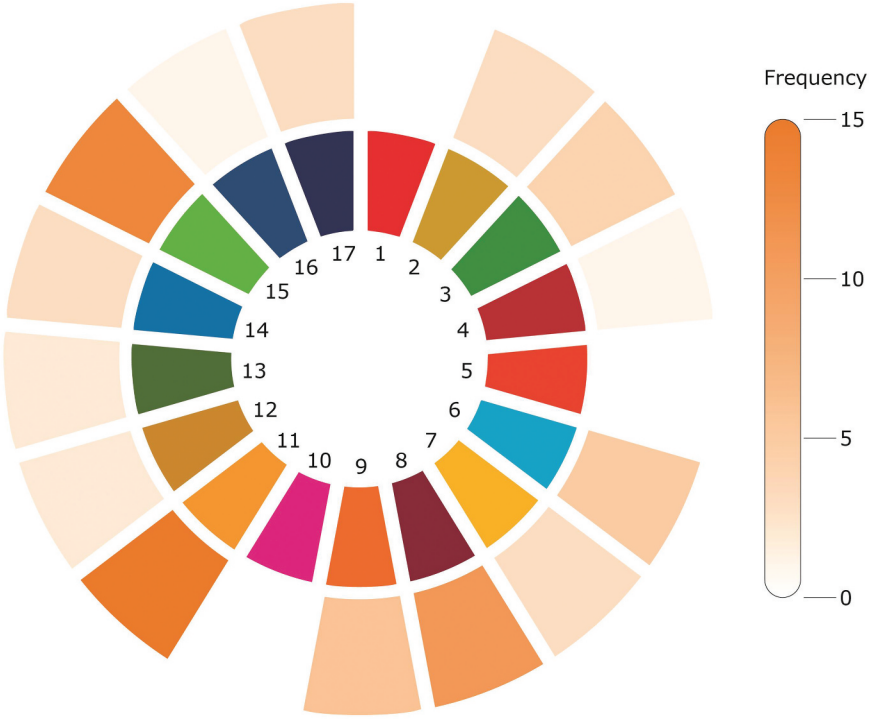


Figure 4. Representation of the SDGs based on the frequency of observed targets appearing in our sample. Goal 11 (Sustainable cities and communities), Goal 15 (Life on land) and Goal 8 (Decent work and economic growth) are most represented. Goal 1 (No poverty), Goal 5 (Gender Equality), and Goal 10 (Reducing inequality) are not represented.

another taxonomy that could be used, as for example by Cebrián-Piqueras et al. (2020) for sensemaking of local visions. Whether the use of these alternative taxonomies as part of our approach would lead to different outcomes remains to be investigated. Due to our emphasis on plurality, we did not perform an ex-post analysis of the specific value perspectives represented in the visions (*c.f.* Harmáčková et al. 2021), although a local elaboration of the specific value perspectives resulting from such analysis would make for an interesting comparison with alternative taxonomies. What we consider instrumental is that selected value perspectives are effective in helping people discover the multiple ways in which they appreciate nature. In general we see merit in the coexistence of a diversity of taxonomies (sensu Janssen et al. 2015). The NFF has as advantage that its development is currently catalyzed under IPBES in collaboration with the broader scientific community (IPBES 2021; Kim et al. 2021). It is also relatively easy to use as it presents only three value perspectives to constitute a minimal space for discovering value plurality (Figure 1).

As one of the first field tests of the NFF, the application in NPHD showed that all three value perspectives, including *Nature as Culture*, can resonate in a densely populated area in northwestern Europe. In fact, the use of the *Nature as Culture* value perspective was found to be particularly useful by the director of NPHD, who was involved in co-design of this study and is an author on this paper. Its consideration helped participants move beyond the dichotomy between intrinsic and instrumental values that dominates existing discussions in the area. Participants were successfully able to discuss the interior space of the NFF. Rather than a shift in values, the process helped to open-up to a broader appreciation of nature, based on which a broader set of policies can be formulated and new partnerships explored.

The nature futures of NPHD workshop process

Indeed, the NFF-based process in NPHD yielded rich discussions that serve as a source of inspiration for stakeholders. Tellingly, the three group names embody and hence point to important strategies for dealing with identified challenges, that is, a hard coupling between housing development and nature development (How Green is Red?), making connections, physical and relational, for new partnerships (The Bridge Builders), and strengthening local identity as a leverage point for collective action (Our Park Hollandse Duinen). The process helped participants discuss how not everything is possible, but a lot might be, especially when underpinned by a joint sense of what the overall direction should be. Collaboratively created visions serve as a boundary object for constructive conversations about what that direction should be (Van Rooij et al. 2021). Such visions can, and even should, be pluralistic (McPhearson et al. 2016); they do not have to be fully shared among actors in order to provide a target space for collaboration. Importantly, the

participants identified a critical need of a shared set of key values and principles, the 'DNA of NPHD', to structure a boundary process towards the desirable futures for NPHD (Figure 5), to fly as a 'flock of starlings'. To a large extent the pluralistic vision and shared principles are already formed by the national park partners, as presented in the official ambition document (NPHD 2017) and landscape strategy (Veenstra 2020), following extensive stakeholder engagement. Yet, in support of the first working program of NPHD 2021–2025 (NPHD 2020b), these can be further evolved, enriched and operationalized.

Indeed, the approach aligned well with the broader development process of NPHD. As such, the process did not initiate a structural break in the development trajectory of NPHD. Rather it supported the existing process, for which it was recognized as a useful tool by the director of NPHD. Starting the process with surfacing and reflecting on people's diverse relationships with nature, facilitated by the NFF, was something that resonated. It inspired a more reflexive approach (c.f. Schultz et al. 2018; Horcea-Milcu et al. 2019) in subsequent engagement processes; How are people entering the process; what values do they hold and bring in? So far that was a bit underexposed in the broader development process of NPHD.

Another aspect of the process that resonated was the exploration of the three time horizons. That thinking fitted-in well with a broader but somewhat ad-hoc iterative process of dreaming big and reflecting on the present by national park actors, and helped to emphasize long-term thinking during development of NPHD's landscape strategy (Veenstra 2020). More generally, what worked well was the clear structure and stepwise design of the process, through the six phases, that still allowed for flexibility in how it was applied. The success of visioning processes often depends on who participates. Indeed, not everyone feels comfortable with dreaming about a radically different future. Useful therefore is how the Three Horizons Framework promotes inclusivity as it provides flexibility to switch between time horizons depending on the emerging group dynamics. This was reflected by the dynamics of the three groups in this workshop: each completed the six phases of the process, but focused on different parts (Table 1). Furthermore, it was appreciated that the workshop process based on the NFF and the Three Horizons is rather different from traditional workshops. As such, it offered the actors involved in the co-design of the process a reflection on alternative tools and methods for informing change processes, and enlarged their toolbox of available workshop methods.

Contributing to the Agenda 2030

The SDG Target analysis shows how development of NPHD towards the envisioned futures would result in progress for almost all of the SDGs. In particular there appears to be a large potential for NPHD to contribute to Goals 8, 11, and 15. Our analysis also uncovered several SDG targets that are deemed relevant for NPHD but which were not brought up by the participants during the workshop. These targets may indicate unrecognized potential for NPHD to contribute to sustainable development. For example, one topic that was clearly underexposed is *equity* (targets 5.5, 16.b, 10.3, 10.7). There is also relatively little attention for the contribution of NPHD to *public health* (targets 3.3, 3.D), though it must be noted that the workshop process took place a few months before the COVID-19 pandemic hit. Recent increased attention to nature-health relationships is likely to have shifted this focus (Kleinschroth and Kowarik 2020).

It is important to point out the limitations of the SDG analysis as applied in this study. The sticky notes are not very suitable as sampling units as they contain limited and diverse information. In response, the researchers took an inclusive approach to coding the sticky notes. It is likely that more specific ideas for the future of NPHD have scored fewer targets than broad or ambiguously formulated ideas indirectly touching on various targets. It is therefore important to focus on the more generic patterns emerging from this analysis, such as the three goals that clearly stand out and the most frequently appearing targets. Indeed, the SDG Target analysis is not

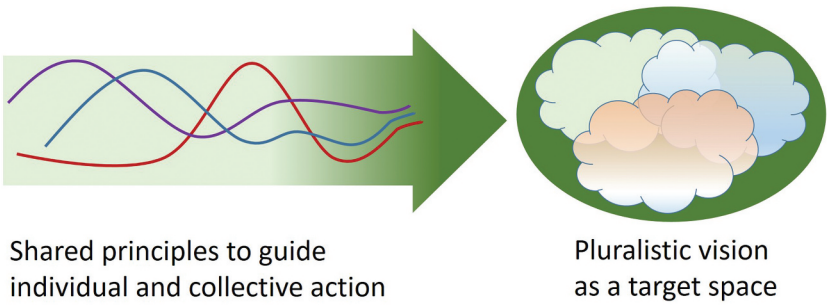


Figure 5. Conceptual figure depicting how a loosely defined collective vision can act as a boundary object for a boundary process guiding individual and collective actions based on a set of shared principles.

intended to provide hard evidence, rather as a starting point for critical reflections on which aspects of sustainability are to be considered and prioritized by NPHD. Even so, an additional step of Jiménez-Aceituno et al. (2020) that we have not done here, but which can still provide interesting insights, is an analysis of interactions between the SDGs through the elements of the visions. This may help understand how progress towards a specific target may be leveraged to attain various aspects of a desirable future for NPHD.

Heinrup and Schultz (2017) described UNESCO Biosphere Reserves in Sweden as arenas for implementing the Agenda 2030, distilling five key functions: they serve as platforms for collaboration; connect actors vertically and horizontally, maintain healthy ecosystems, promote learning and awareness raising, and integrate the SDGs. As a close relative of Biosphere Reserves, NPHD too can be an arena for implementation of the 2030 Agenda. Yet, to date, the SDGs have not played a significant role in the development process of NPHD, nor more generally in Dutch nature conservation and landscape governance. However there are actors in the region who are actively engaging with SDGs as part of their operations. As such, NPHD may strategically employ the SDGs as a tool to link with specific actors. Similarly, adopting the SDGs may help to better portray the international context of the national park. The insights gained through the SDG target analysis about which goals and targets are relevant are expected to be useful here.

Besides understanding how NPHD may contribute to achieving the SDGs, the visions for NPHD, and NFF-inspired development processes more generally, may also provide valuable insights into what aspects of sustainable development are currently missing from the SDG framework. We did not do an NFF analysis of the SDGs but close inspection of the SDG targets informed us that there is much focus on *Nature for People* and a bit on *Nature for Nature* but very little on *Nature as Culture* value perspectives. We note, for example, that landscapes are not represented in the SDGs, let alone biocultural landscapes (Chakroun and Droz 2020; Hanspach et al. 2020). Zheng et al. (2021) recently highlighted a general under-appreciation of culture in the Agenda 2030. We point to a critical interrogation of the SDGs using the NFF as important future research.

How the approach can be further developed

The 1-day workshop process, whilst a useful activity for the stakeholders and as a case study to explore how the NFF could be operationalized in a local level case study, also had its limitations. For a fully immersive futuring process, it is advisable to bring people together for a couple of days to fully engage them with the process, unpack potential inconsistencies and work through potential conflicts. This workshop process was developed from a longer Manoa mash-up method approach that was initially established as a 3–4 day workshop (Pereira et al. 2017; Raudsepp-Hearne et al. 2020). A potential next step could therefore be to consolidate the visions that emerged during the workshop in NPHD into more integrative and coherent narratives through a longer process whereby a full Manao mash-up method is employed. Steps for such extended narrative development could build from the newspaper headlines in this paper (Table 1) and use either the VERGE framework to ask participants to describe certain aspects of the future world, such as what is created/what is destroyed/what is consumed (Lum 2015) or take a more science-fiction prototyping approach whereby a narrative is developed around a core character in this future world (Merrie et al. 2017). The latter has informed the development process for illustrative narratives of future worlds using the NFF (PBL 2020). Another aspect could be to get more creative with the visions so that they are able to draw on people's emotional attachment to the national park (Pereira et al. 2019). Graphic facilitation helped participants to visualize their discussions, but more engaged artistic experiences such as through theater or photography could elicit other connections to nature value perspectives (Galafassi et al. 2018; Muhr 2020).

While our analyses focused on the visioning of the third horizon, an important part of the participatory process was the exploration of transformative change through all three horizons in steps 3–5. This is a first step in developing pathway scenarios that connect the visions and describe how to get to these more desirable futures (Hamann et al. 2020). The second horizon already offers building blocks for connecting the future visions with the present and outline some specific interventions, but these can be made more concrete and potential conflicts and trade-offs unpacked (Raudsepp-Hearne et al. 2020). An example here is how agriculture inside the national park is both a challenge and an opportunity for achieving desirable nature futures of NPHD. Creating multiple pathways emphasizes that there is no single trajectory and makes explicit different perspectives and trade-offs. It is also possible then to compare and contrast these local scenarios with elements in existing global scenarios, such as the Shared Socioeconomic Pathways, to delineate what alternatives to the dominant global narratives there may be (Aguiar et al. 2020). Similarly, enabled by the thematic analysis (Table 2), these local scenarios may be cross-fertilized with other local NFF-inspired scenarios (e.g. Lembi et al. 2020), and feed into the inductive

scenario development process of the IPBES task force on scenarios and models to better inform future assessments (Pereira et al. 2020).

We noticed that the participants found the second horizon fairly difficult to grasp. Although we asked the graphic facilitator to highlight the second horizon during the process (see Appendix E), relatively few sticky notes were generated (Table 1). Arguably, this horizon is the most challenging for participants to grapple with, as it connects the harsh, present day reality with a dreamed-up future. To give the second horizon more content, towards the articulation of pathway scenarios, phase five of our process could have focused more explicitly on actions, akin to Harmáčková et al. (2021). Additionally, we could have invited more local entrepreneurs and innovators to join the process. As this was the final step of an intense interactive process, fatigue may have played a role as well. This gives another argument for a multi-day workshop, provided that participants are able to make a larger time investment.

Responding to the remark of one of the participants that 'now we need maps and start drawing', a step to extend and concretize the visioning and pathway exploration approach would be to develop spatially explicit scenarios and create maps to visualize the possible futures. Such a step could be facilitated through participatory mapping approaches where stakeholders jointly spatialize their visions (Palacios-Agundez et al. 2015; Reilly et al. 2018). This could serve as a cross-check to determine whether the visions could be realized within the study region. The scenario maps would form the basis for further assessment and quantification of ecosystem services and implications for biodiversity. Easy-to-use, readily available ecosystem services models such as InVEST can be applied for such assessments (Ruckelshaus et al. 2015; Hamel et al. 2021), specifically to analyze implications regarding the *Nature for Society* perspective of the NFF. From the *Nature for Nature* and *Nature as Culture* perspectives the visions and desires of people, as surfaced during our process, challenge conventional modeling approaches, as these fail to represent the known diversity of people-nature interactions (Kok et al. 2016; Rosa et al. 2017).

National parks and other forms of protected areas are increasingly understood as complex adaptive systems, subject to nonlinearity, uncertainty, emergence and self-organization (Berkes 2004, 2007; Cumming and Allen 2017). From that perspective, the objectives of NPHD will likely evolve over time, and the process of developing the park will never be 'finished'. Navigating the development trajectory of NPHD towards desirable futures for nature and people can benefit from adaptive co-management approach that includes frequent visioning and pathways exploration as part of a continuous stakeholder engagement process (Olsson et al. 2004; Van Kerkhoff et al. 2019). As such, the outcomes generated by the workshop process in NPHD should not be seen as final products and could become stepping stones in a series of engagements. Yet, depending on the aims of the process, the scope may be narrowed down further to hold more focused discussions. For example, a follow-up workshop could focus on nature futures of the bulb agriculture within NPHD, to identify more integrated solutions to a known policy challenge. Whatever the context and the aims, it is important to clearly communicate before the workshop to participant stakeholders what will be done with the outcomes. And, in that same vein, to report back to the participants after the workshop what is done with the results.

Conclusion

This paper presents a novel approach to exploring nature futures that combines a participatory visioning process with analyses of the output. We applied the approach to support the development process of Nationaal Park Hollandse Duinen, and designed the approach to test the NFF, a new framework for nature-centered scenario development. We found that the NFF enabled collaborative discovery of diverse perspectives on nature, and, in conjunction with the Three Horizons framework, enabled nature-centered visioning and pathway exploration. The two analyses exposed the plurality captured in collaboratively created visions of nature futures of Nationaal Park Hollandse Duinen and provided insight into the potential contribution to the Agenda 2030. The approach aligned well with the development process of Nationaal Park Hollandse Duinen for which it strengthened long-term thinking and plural valuation of nature, which got carried forward in the official landscape strategy for the national park. While the approach as presented in this paper represents only a first step in the development of more integrated scenarios to inform policy and planning, we see large potential for its application in various contexts to scaffold discussions about *the futures we want* for nature and people, and how to achieve them.

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Disclosure statement

GL is director of the national park that was the case study area for this study. JJK, GDP, SKV, LMP are part of the IPBES task force that developed the framework that was tested in this study, however this study was not a task force activity. The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Data availability statement

The data that support the findings of this study are available from the corresponding author, JJK, upon reasonable request.

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