



Breaking out of conventions: How scenario planners can increase their reflexivity regarding societal imaginaries

Lucas Rutting^{*}, Joost Vervoort, Heleen Mees, Peter Driessen

Copernicus Institute of Sustainable Development, Vening Meinesz Building, Princetonlaan 8a, 3584 CB Utrecht, the Netherlands

ARTICLE INFO

Keywords:

Participatory scenario planning
Imaginaries
Sustainability governance
Plurality
Transformations
Global South

ABSTRACT

Futures imagined in scenario processes reflect both stakeholder perspectives and broader societal imaginaries: collectively-held, institutionally-stabilized visions of the future. The presence of imaginaries has mostly remained implicit in studies of scenario planning, especially in development contexts. We argue that scenario planning will benefit from reflexivity regarding imaginaries. Here, reflexivity refers to an awareness regarding different perspectives, assumptions, values, and—oft-hidden—politics at play. We developed a framework of relevant imaginaries and assessed how and to what extent these are expressed in scenario narratives, through analyzing seven scenario sets focused on agriculture, food security and climate change in the Global South. Our results show that neoliberal and sustainable development imaginaries are dominant in these scenarios. Imaginaries from the Global South are scarcely represented—arguably because of that, we observe few regional perspectives on potential challenges in these scenario sets. We conclude that the scenario sets offer effective critique on neoliberal mechanisms and global development dynamics, but do not provide significant room for transformational alternatives from the Global South. We argue that opening up explorative scenario planning to more pluralistic conceptions of the future can greatly enhance its reflexivity, and a representative mix of imaginaries allows for scenario planning that leads to more transformational policies.

1. Introduction

Over the last couple of decades, the use of scenario planning as an approach for guiding environmental governance processes has steadily increased (Wiebe et al., 2018). Participatory scenario planning, so it is often claimed, holds the potential to bring together stakeholders' perspectives and worldviews, and to interrogate and challenge values and assumptions through exploring different futures. It is said to enhance the representation of environmental concerns of different actor groups, and hence the inclusiveness and legitimacy of decision-making processes (Shaw et al., 2009; Butler et al., 2014; UNDP, 2014; Newig et al., 2018).

Scenario planning can help to acknowledge and navigate future uncertainty in decision making (Wiebe et al., 2018; Muiderman et al., 2020). It is often organized in a participatory manner, to increase the inclusiveness of the process, and because stakeholder participation is claimed to contribute to an increased effectiveness of governance (Stirling, 1999; Newig et al., 2018). In addition, participation is thought to increase the rigor of decision-making processes through integrating the knowledge and perspectives of different stakeholders (Stirling, 1999). In this paper, we argue that there is an under-researched aspect to the representation of diverse

^{*} Correspondence to: Copernicus Institute of Sustainable Development, Utrecht University CGIAR Initiative on Climate Resilience (ClimBeR), Princetonlaan 8a, 3584 CB Utrecht, the Netherlands.

E-mail address: l.rutting@cgiar.org (L. Rutting).

<https://doi.org/10.1016/j.futures.2024.103395>

Received 9 May 2023; Received in revised form 22 February 2024; Accepted 27 April 2024

Available online 4 May 2024

0016-3287/© 2024 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

views in scenario planning which relates to the deeper, sometimes taken-for-granted images of the future in society, or *imaginaries*. Imaginaries can be defined as collectively held and often institutionally stabilized and publicly performed visions of the future (Castoriadis, 1975; Taylor, 2002; Jasanoff & Kim, 2009; Milkoreit, 2017). Imaginaries can also be understood to create much of the possibility space for conceiving of the future in society. We believe that more explicit attention to imaginaries in scenario planning will help to increase reflexivity to fundamental but often implicit politics underlying futures imagined in participatory scenario planning processes. To this end, we use the term *political reflexivity*, which refers to an awareness of one's own perspective, assumptions, beliefs, values, and political motives, as well as those of other actors, and of the politics at play between different groups of stakeholders (Rutting et al., 2022). In this paper, we want to initiate a line of research that may instigate a form of reflexivity about the effects of the presence—or *absence*—of certain imaginaries in the futures imagined in participatory, explorative scenario planning processes. The notion of imaginaries has been applied to different topics, which has led to conceptualizations of socio-technical imaginaries (Jasanoff & Kim, 2009), climate imaginaries (Milkoreit, 2017) and more. While imaginaries and futures work connect, research into the presence of such imaginaries in scenarios is as of yet underdeveloped. We hypothesize that explicit, methodological attention to imaginaries will benefit scenario planning—it will enhance reflexivity regarding different imaginaries that exist in society and why they may or may not influence a scenario planning process. This will potentially open up the decision-making process to transformative alternatives. To this end, we explore how and to what extent diverse imaginaries are reflected in or expressed through scenarios. We will assess which imaginaries are over- and underrepresented in a set of participatory scenario processes aimed at guiding environmental governance. We focus on scenario processes in the Global South, where, at least in certain internationally oriented technocratic contexts, imaginaries that originally emerged in the Global North are often still dominant over imaginaries from those regions themselves (Escobar, 2015; Beling et al., 2018). In other words, the future—which can be considered as a public good (Bourgeois et al., 2022)—can be seen as “colonized” by these Global Northern imaginaries. This could have serious implications such as reproducing power dynamics rooted in colonialism. In addition, imaginaries rooted in the Global South often offer transformative alternatives to growth-based development imaginaries, i.e. the neoliberal growth imperative and conventional notions of sustainable development (Beling et al., 2018).

There is a rich literature highlighting the dominance of Western worldviews and derived modes of governance in the Global South (e.g., Galtung, 1990). Such Western worldviews are characterized by a present-centered and linear conception of time, analytic rather than holistic conceptions of epistemology and a dichotomous conception of man and nature (Galtung, 1990). Jim Dator stressed the importance of decolonizing the future as an integral part of futures studies—interrogating privileged futures and empower marginalized voices should be central to the field, he argued (Dator, 2005). He actively advocated for the Global South to reject the Western development model and to pursue their own versions of desirable futures, i.e. their own imaginaries. In addition, Elise Boulding called for decolonizing futures through broadening and deepening methods for imagining more inclusive and “responsible” futures. She argued that the North failed “to develop more inclusive imagery [...] and to learn from the countries of the South about [...] problem solving not based on high-tech lifestyles” (Boulding, 1991:529) and to recognize traditions of “futures-imagining” in the Global South (Boulding, 1991). Similarly, in the book “Rescuing All Our Futures” Ziauddin Sardar and a variety of scholars from different fields contend that while the future should be “the last frontier” in which people and societies from the Global South are still free to imagine the futures they desire, the global hegemony of Western science, rationalism and institutionalism has increasingly come to dominate futures studies too, and hence, colonized the future. From different perspectives, they argue how pluralism and multiculturalism can help steer futures studies in new, decolonizing directions (Sardar, 1999).

We contend that more awareness of the presence and influence of imaginaries stemming from different geographical and cultural traditions in scenario sets helps to increase scenario planners' reflexivity and can contribute to the aforementioned need to decolonize futures studies. Moreover, it can help to inform and guide decision-making, as this allows for the expression of new, transformative ideas as alternatives to currently dominant imaginaries. We analyze the presence of imaginaries in the scenario sets developed under the Scenarios Project of the CGIAR Research Programme on Climate Change, Agriculture and Food Security (CCAFS), an extensive global scenarios project consisting of seven sub-global/regional scenario sets aimed at guiding anticipatory governance processes around agriculture, food and climate in the Global South. We focus on analyzing the scenario sets themselves, as they have been used in a range of different policy formulation processes. As such, these scenario sets can be regarded boundary objects that have been applied in different decision-making contexts (Vervoort et al., 2014). It is important to analyze the scenario texts in themselves, since these texts have played a key framing role in many processes. We want to note that the lead and second author of this paper were affiliated with the CCAFS Scenarios Project—both were involved in the design and facilitation of scenario planning processes. This project is particularly interesting as we ourselves, as researchers and practitioners, over the course of this ten-year project gradually recognized the need for greater reflexivity regarding imaginaries. As such, it offers an example of an attempt at reflexive practice—through critically examining the CCAFS scenario sets, we aim to formulate recommendations for more reflexive scenario planning.

We proceed with an account of the theories relevant for our research, and introduce our analytical framework based on these theories. We continue with a more elaborate description of the case study and the data set, and explain the context in which this project was established. Then, we explain how we analyzed these data and present the results of our analysis. Finally, we discuss these results, draw conclusions and provide suggestions for further research.

2. Theoretical framework

The term *imaginary* has been conceptualized in various ways (see Castoriadis, 1975, Taylor, 2002, Jasanoff & Kim, 2009, Hajer & Pelzer, 2018). Among the earliest theorizations about collectively held images of the future is Fred Polak's work in the first decades after WWII. He contended that, in contrast to the eras of the Enlightenment, the Renaissance and the first industrial revolution, the post-war age lacked images of hopeful futures that can empower “paralyzed” societies to take action (Polak, 1973). Castoriadis'

conception of the imaginary is about what any given society collectively defines as “real”—an idea that relates to work from the fields of social theory, such as Habermas’ “intersubjectively shared lifeworld” (Habermas, 1996) and sociology of knowledge, such as Berger and Luckmann’s theory on the “social construction of reality” (Berger & Luckmann, 1966).

Building on earlier definitions, Jasanoff and Kim (2015) define imaginaries as ‘collectively held, institutionally stabilized, and publicly performed visions of futures.’ Milkoreit (2017) offers a critique on existing definitions of imaginaries as they tend to focus on desirable and attainable futures, and often do not explicitly take into account nature, i.e. biophysical systems such as the climate system. Milkoreit defines socio-climatic or socio-environmental imaginaries as “collectively held visions of the future that include the natural environment, possibly even as an agent rather than a mere object or context” (Milkoreit, 2017:3). She adds to this definition that imaginaries should pay attention to the complexity of social-ecological systems, and can depict both desirable and undesirable futures (Milkoreit, 2017). Building on Milkoreit’s definition, and to fit the objective of this study, we define imaginaries in our research context as *collectively held visions of the present and future, focused on development of humans and society, and the social-ecological systems in which they exist. They can include both desirable and undesirable depictions of the future.*

Understanding that futures imagined in scenario processes are a product of such widely-held imaginaries is important in order to be able to see the politics and framings at play during the creation of such futures.

An important tenet in this paper is that imaginaries “can co-exist within a society in tension or in a productive dialectic relationship” (Jasanoff & Kim, 2015:4) and that different societal stakeholders do not merely have different perspectives on a “shared reality,” but that, in an important sense, they actually live in different present worlds and reflect on different pasts, and that these multiple worlds therefore give rise to different shared futures as well (Vervoort et al., 2015). Particularly in the context of the Global South, there is the need for explicitly pluralistic futures, allowing narratives and imaginaries rooted in cultures from those regions to contest globally dominant narratives of development. As Escobar (2018) puts it, there is a need to leave the economically and politically dominant ‘One World-World’ that originated in the Global North and to cultivate a ‘pluriverse’ of interconnected worlds instead, each with a range of future possibilities (Escobar, 2018). This relates to a recent paper by Muiderman et al. (2020), which presents a typology of approaches to the future in foresight and anticipatory governance—in addition to approaches focusing on probable and plausible futures, there are approaches to the future that understand the need to engage with this fundamental pluralism as well as approaches that critically interrogate the performative effects of imaginaries. It could be argued that the majority of current environmental foresight focuses on probable or plausible futures. However, plausibility, Ramirez and Selin (2014) argue, is in fact a subjective and potentially limiting notion when it comes to scenario thinking. Through developing truly pluralistic futures, and through reflecting on a plurality of societal presents and pasts, more radically transformative ideas can be explored, opening up the scope for action (Vervoort et al., 2015; Muiderman et al., 2020). Moreover, building on Stirling (1999) and Gibson (2006), we argue that involving diverse and potentially affected stakeholders means that each can bring in important knowledge and their own concerns, framed by diverse imaginaries. Such diversity can lead to richer futures in scenario exercises, allowing for more rigorous assessment of transformation pathways. In addition, active and inclusive stakeholder participation opens up dialogue and deliberation between stakeholders, and allows for the consideration of important lay-local and context-specific expert knowledge, potentially leading to new insights and innovative results (Lejano & Ingram, 2009; Kochskämper et al., 2016; Newig et al., 2018). This provides essential insights for addressing complex sustainability problems (Gibson, 2006; Stirling, 2009; Edelenbos et al., 2011; Glucker et al., 2013). It also taps into the plurality of insights, perspectives and knowledge of diverse stakeholders and allows for social learning, through which a shared understanding of problems at hand can be reached, which in turn might lead to better diagnosis of such problems (Reed et al., 2010; Heikkilä & Gerlak, 2013; Jager et al., 2020).

3. Framework for analysis

For our analysis we developed a framework of ideal-typical imaginaries. We chose to define broad categories of imaginaries building on Escobar (2015), each representing a range of more specific imaginaries. Our typology builds out from the imaginary of ‘sustainable development’, because of our focus on scenario planning in an agricultural development context in which this imaginary is most prevalent. In addition, our typology consists of one other major, widespread imaginary—the neoliberal imaginary—as well as two other types, the degrowth imaginary and the category of regional imaginaries—this last category includes different imaginaries from the Global South that share important traits and challenge globally dominant ideas. We chose to develop this typology independently of the scenarios we analyzed as this allows for a more diverse scope of imaginaries. A typology derived from the scenarios would be restrictive in the sense that it would not show which major imaginaries are absent from the scenario sets.

The first imaginary we distinguish is the ‘sustainable development’ imaginary. This imaginary arose in the late 1980 s, when the term sustainable development was first introduced in the well-known report “Our Common Future”, also known as the “Brundtland Report” (World Commission on Environment and Development, 1987) and was further elaborated upon in Agenda 21, the product of the 1992 United Nations Conference on Environment and Development (UN General Assembly, 1992). It has been dominant in international development discourse since (e.g. Hout, 2010; Hák et al., 2018). A more recent manifestation of this imaginary is the UN’s 2030 Agenda for Sustainable Development, which introduced the Sustainable Development Goals (United Nations, 2015). We define the sustainable development imaginary to include both environmental, economic and social sustainability, and—while acknowledging there are “limits to growth”—to be still rooted in an imperative of economic growth.

The second imaginary we distinguish is the neoliberal imaginary. This imaginary has been a dominant one throughout the last half century. In this paper we define the ‘neoliberal’ imaginary as a meta-narrative based on dominant, neoliberal Anglo-American narratives, which continues to be a dominant force in global politics (Haddad, 2008; Bond & Dorsey, 2010). Central to the neoliberal imaginary are economic growth, economic liberalism, free-market capitalism and deregulation (Vincent, 2009; Bloom, 2017). The

neoliberal imaginary comprises other, more specific imaginaries, such as resource-based and extractivist imaginaries (Childs & Hearn, 2017; Barandiarán, 2019).

Third, we distinguish the ‘degrowth’ imaginary (Demaria et al., 2013; Escobar, 2015; Beling et al., 2018; Mastini et al., 2021). The idea of degrowth was first coined in 2001 in France and was “born as a proposal for radical change” (Demaria et al., 2013:192). It offers a critique of the current neo-liberal development hegemony and quickly evolved into a social movement (Demaria et al., 2013). The degrowth imaginary emphasizes the articulation of social and environmental justice demands and the rationale that through slowing down economic growth, it will be easier to tackle environmental problems, for example to cut carbon emissions (Demaria et al., 2013; Mastini et al., 2021).

Finally, we distinguish a fourth category: ‘regional’ imaginaries. This category includes all imaginaries that have emerged in different regions in the Global South and that are now being connected and seen as related. The most well-described regional imaginaries include ‘Buen Vivir’ and related imaginaries in Latin America, ‘Ubuntu’ and related imaginaries in Africa, and Ecological ‘Swaraj’ in the Indian subcontinent. They are very much regionally embedded, but also share a number of characteristics recognized by Global South and decolonial scholars, such as an egalitarian stance and focus on the collective, a holistic, non-dualistic perspective that does not distinguish humans from the earth and nature, and acknowledgement of plurality of perspectives and worldviews (Muwanga-Zake, 2010; Escobar, 2015; Beling et al., 2018; Poesche, 2019). The main characteristics of these four ideal-typical types of imaginaries are summarized in Table 1.

4. Methods

4.1. Case study

In this paper, we analyzed a large-scale case: the Scenarios Project of the Climate Change, Agriculture and Food Security research program (CCAFS) of the CGIAR, a global partnership of international organizations focused on research around agriculture and food security. From here on, we refer to it as “CCAFS Scenarios Project”. In seven sub-global regions—Central America, the Andes, West Africa, East Africa, South Asia, Southeast Asia and the Pacific—sets of exploratory, qualitative scenarios were developed by a range of stakeholders from the respective regions, representing governments, research, private sector, media and civil society (Chaudhury et al., 2013; Vervoort et al., 2014; Palazzo et al., 2017).

These seven scenario sets with a regional geographical focus were developed in a bottom-up fashion. Per region, four or five different scenarios were developed, each describing different regional futures, addressing political, social, economic, and environmental developments and events. Three scenario sets (West Africa, East Africa and the Pacific) were developed using the two-axes method (see Chaudhury et al., 2013), and four sets (Andes, Central America, South Asia and Southeast Asia) with the Optimized Linear Diversity Field Anomaly Relaxation (OLDFAR) tool (see Lord et al., 2016). The two-axes approach allows for more transparency in the scenario logics, while the OLDFAR method allows for a higher multidimensionality of drivers to be included. The scenarios have been used in a variety of national- and regional-level SES governance processes, primarily focused on policy formulation, and have led to a range of policy outcomes (Chaudhury et al., 2013; Herrero et al., 2014; Vervoort et al., 2014; Mason-D'Croz et al., 2016; Palazzo et al., 2017; Hebinck et al., 2018).

The CCAFS Scenarios Project ran from 2010 till 2021. Its aim was to contribute to policy change leading to climate adaptation and mitigation and increasing food and nutrition security through developing different, challenging, explorative future scenarios that were used to investigate feasible options for national policies. Thereby, it aimed to open up policy development processes to a range of stakeholders, including vulnerable and marginalized groups who normally do not have access to policy formulation processes. The

Table 1
Ideal-typical imaginaries.

| Imaginary | Neoliberal Imaginary | Sustainable development | Degrowth imaginary | Regional imaginaries |
|-------------|--|---|---|---|
| Description | Meta-narrative of capitalist progress – neoliberal, dominant Anglo-American narrativesAssertion in open markets will lead to economic growthgrowth will lead to development of governance and institutions | Tries to incorporate notions of sustainability and inclusion into the narrative of production, consumption and trade, maintaining economic growth as a central objectiveSustainable development as introduced in BrundtlandFocused on reducing poverty in developing countries instead of affluence in NorthSees economic growth as necessary to address environmental problems | Critique of growth: challenging the inherent ecological and social unsustainability of economic growth-focused political economyDownscaling of production and consumptionAbolishment of economic growth as an objective for societyDifferent social structureTransforming current institutions and rules“Atheism” in relation to the “dogma” of economic growth | Shared characteristicsPluralisticEgalitarianCollectivityHolistic, non-dualistic Buen Vivir or Sumak Kawsay (South America)Derived from life philosophies of indigenous societies in South America Centered around cultural diversity/pluri-culturalism, inseparability of all life's elements, opposition to the notion of perpetual growthRejects dichotomies such as nature-society dualismEcological Swaraj or Radical Ecological Democracy (India)Strongly democratic and egalitarianAbout empowering everyoneHolistic vision of human well-being: physical, material, socio-cultural, intellectual, spiritualCollectives and communities at the center of governance and economyUbuntu (Sub-Saharan Africa)Philosophy practiced by Bantu peoples across AfricaFocused on collectivity, inclusivity |

Table 2*Results: imaginaries in scenario sets.*

| <i>Imaginary</i> | Central America | Andes | West Africa | East Africa | South Asia | Southeast Asia | Pacific |
|--|--|---|--|---|---|---|--|
| Neoliberal imaginary | 1 out of 4 scenarios reflect aspects of the neoliberal imaginary | 2 out of 4 scenarios reflect aspects of the neoliberal imaginary | 4 out of 4 scenarios reflect aspects of the neoliberal imaginary | 4 out of 4 scenarios reflect aspects of the neoliberal imaginary | 3 out of 5 scenarios reflect aspects of the neoliberal imaginary | 4 out of 4 scenarios reflect aspects of the neoliberal imaginary | 2 out of 4 scenarios reflect aspects of the neoliberal imaginary |
| Neoliberal from sustainable development (SD) perspective | 3 out of 4 scenarios describe the effects of neoliberal mechanisms from perspective of SD imaginary | 2 out of 4 scenarios describe the effects of neoliberal mechanisms from perspective of SD imaginary | 3 out of 4 scenarios describe the effects of neoliberal mechanisms from perspective of SD imaginary | 4 out of 4 scenarios describe the effects of neoliberal mechanisms from perspective of SD imaginary | 3 out of 5 scenarios describe the effects of neoliberal mechanisms from perspective of SD imaginary | 2 out of 4 scenarios describe the effects of neoliberal mechanisms from perspective of SD imaginary | 2 out of 4 scenarios describe the effects of neoliberal mechanisms from perspective of SD imaginary |
| Sustainable development imaginary | 1 out of 4 scenarios reflect aspects of SD imaginary | 2 out of 4 scenarios reflect aspects of SD imaginary | 2 out of 4 scenarios strongly reflect aspects of SD imaginary | 3 out of 4 scenarios reflect aspects of SD imaginary | 3 out of 5 scenarios reflect aspects of SD imaginary | 4 out of 4 scenarios reflect aspects of SD imaginary | 3 out of 4 scenarios reflect aspects of SD imaginary |
| Degrowth imaginary | - | - | - | - | - | - | - |
| Regional imaginaries | 2 out of 4 scenarios reflect elements of regional imaginaries (4% of text coded as reflecting imaginaries) | - | 2 out of 4 scenarios reflect elements of regional imaginaries (8% of text coded as reflecting imaginaries) | - | - | - | 1 out of 4 scenarios reflects elements of regional imaginaries (11% of text coded as reflecting imaginaries) |
| Overall score | High | Medium | High | Medium | Medium | Medium | High |

project was led by researchers from across the CGIAR organization as well as a number of universities and national research organizations and funded by a host of development funders, including national governments and the European Union (Vervoort & Gupta, 2018).

In many of these policy formulation processes, the main partners were policy makers with a positivist and quantitative planning background. Their conception of the future mostly fit within the probability realm (Muiderman et al., 2020)—it was seen as something we can anticipate and prepare for in the present. As a result, these key partners (as well as many of CGIAR's researchers who shared a similar quantitative background) demanded that quantitative modelling played an important part next to the originally proposed qualitative, explorative scenarios, which by themselves were not considered sufficiently scientific because of their qualitative nature at the start of the project.

The CCAFS Scenarios Project aimed to open up this approach to the future by introducing a explorative scenarios approach based in a plausible futures mindset (Muiderman et al., 2020), acknowledging future uncertainties and regarding the future as an open and unpredictable space. The scenario processes that took place under the CCAFS Scenarios Project were designed to take into account the wider, contextual dynamics, beyond the realm of agronomy and agricultural economics—disciplinary perspectives that oftentimes frame decision-making and planning around agriculture and food systems. The resulting scenarios were used to test the robustness and feasibility of in-progress national-level government policies and plans in the face of future uncertainty (Vervoort & Gupta, 2018). The processes were designed to align with the needs of the policy makers as closely as possible. This design approach contributed to a high number of policy outcomes according to the CGIAR's success criteria, i.e., concretely changed policies and strategies (Jost et al., 2014).

4.1.1. Methods of data analysis

We developed the typology of the main imaginaries that can be distinguished, introduced in the previous section. Using this typology, we analyzed the seven scenario sets developed under the CCAFS Scenarios Project to identify which of these imaginaries are present in the scenario sets, to assess their diversity. To this end, the scenario texts were coded (Löfgren, 2013) using NVivo software. This was done in a primarily inductive way, but with the predetermined logic of the main imaginaries in mind. Coding was done by the lead author only, to avoid inconsistencies and ensure reliability, but discussed with the author team. In addition to nodes representing the four ideal-typical categories of imaginaries introduced in the previous section, we included a fifth node: depictions of neoliberal mechanisms from the perspective of the sustainable development imaginary. We did so because the scenarios oftentimes describe neoliberal mechanisms, while framing them negatively or critically—from a sustainable development perspective. These framings describe how neoliberal developments and mechanisms lead to environmental degradation and/or increased social and economic inequity. An example of this is the description of economic developments pushed by governments and private sector actors that cause environmental degradation, increased greenhouse gas emissions, or displacement of local populations (see for example Vervoort et al., 2013). We coded all passages in the scenario sets referring to GDP growth, deregulation, developments pushed by private sector actors, etcetera as expressions of the neoliberal imaginary. Similarly, all passages referring to green growth, environmental concerns, equitable growth, social concerns, etcetera, while simultaneously highlighting economic growth, were coded as expressions of the sustainable development imaginary. Subsequently, all passages challenging the economic growth “dogma” and emphasizing transformational developments beyond economic growth were coded as expressions of the degrowth imaginary. Finally, all passages emphasizing regional autonomy and a (re-)valuation of regional traditions were coded as articulations of regional imaginaries. On basis of the diversity of imaginaries we identified in a particular scenario set, we assigned a score: low, when one imaginary is dominant; medium, when two different imaginaries are articulated in the scenario set to a similar extent; and high, when three or more imaginaries are significantly articulated in the scenario set, with a particular focus on regional imaginaries.

5. Results

The results (see Table 2) show that each scenario set reflects multiple imaginaries. The neoliberal imaginary and sustainable development imaginary—including a critique on neoliberal mechanisms from a sustainable development perspective—are expressed in each scenario set. None of the scenario sets reflect elements of the degrowth imaginary, and three of the seven sets reflect elements of regional imaginaries. These three scenario sets therefore scored ‘high’ in terms of the diversity of imaginaries they reflect: these are the sets for Central America, West Africa and the Pacific. Here, we summarize the results and highlight several overall observations.

5.1. Diversity of imaginaries

Although the neoliberal imaginary was found in all scenario sets, it is important to note the following. Some of the instances of this imaginary were an uncritical adoption of this imaginary, while in other scenario sets the description of neoliberal mechanisms was used to critique neoliberalism and/or introduce problems to the scenarios—in these cases, critiques of the neoliberal imaginary were used, as it were, to create challenging future scenarios. As explained in the methods section, we used separate codes for these two different framings of the neoliberal imaginary.

The (positively framed) **neoliberal imaginary** was found in all scenario sets. It was found in just one out of four scenarios for Central America (example: “*a climate of trust is created and the region begins to be attractive for greater internal and external investment.*”). In the Andes set, it was expressed in two out of four scenarios (example: “*Initially, the agro-export sector energizes the economy.*”). In the West Africa scenario set, we found that all four scenarios reflect aspects of the neoliberal imaginary (example: “*Privatization efforts and infrastructure improvements have increased the quantity and quality of the water system*”). Furthermore, it was found in four out of four East Africa scenarios (example: “*The EAC in 2030 is a trade-oriented, open regional federation with eight member states (Burundi, Ethiopia,*

Kenya, Rwanda, Somalia, South Sudan, Tanzania and Uganda). A common market and currency, together with improved infrastructure and harmonized laws and policies, have led to steady economic growth"). In the South Asia scenario set, we identified aspects of the neoliberal imaginary in three out of five scenarios (example: "Precipice is a scenario in which fast economic growth up to the 2030s has led to decades of rising prosperity and increasing opportunities for many people in South Asia, including education, health care, communication technologies and other benefits."). It was expressed in all four Southeast Asia scenarios (example: "The Golden Mekong Union has a common currency, and a central bank where borders are open and labor could move freely.") and in two out of four Pacific scenarios (example: "By 2030 exports, imports and tourism have increased in the Pacific region. Many people have been able to take advantage of the economic development that has resulted").

We identified descriptions of the **negative effects of neoliberal mechanisms** from the perspective of the sustainable development imaginary in three out of four Central America scenarios (example: "water is abundantly available, but not accessible to all: it is privatized and large quantities are exported."). It was observed in two out of four Andes scenarios (example: "smallholder communities are pressured by private sector actors to sell off their land."). Additionally, we found that three out of the four West Africa scenarios describe the effects of neoliberal mechanisms from the perspective of the sustainable development imaginary (example: "Local resource mining has been aggressively pursued through widespread land use conversion (deforestation) for quick food and fuel"). Similar descriptions were identified in all four East Africa scenarios (example: "Education and welfare have stagnated, except where it is in the interests of the private sector to deliver services to their employees and customers. Gaps between rich and poor and between rural and urban dwellers have widened significantly."). In the South Asia set, we found it in three out of five scenarios (example: "However, in the 2030s, this economic growth, which is largely uncoordinated across national borders, has exhausted natural resources, at the same time the impact of climate change increases—leading to regional instability and plummeting economies in South Asia."). Neoliberal mechanisms described through a sustainable development lens were observed in two out of four Southeast Asia scenarios (example: "Southeast Asia is a very pro-business region, supporting large company interests, while environmental degradation worsens, and inequality persists."), and in two out of four Pacific scenarios (example: "Governments have not prioritised better governance of their natural resources, which has allowed extractive industries, such as fishing, and forestry and agriculture, to expand unsustainably").

Overall, the **sustainable development imaginary** appeared to be the dominant imaginary across all sets. Although it was expressed in only one out of four Central America scenarios, it was the dominant imaginary in that particular scenario (example: "Alternative and renewable technologies have been adopted in the energy, transport and industry sectors. Ecosystem services are valued and protected - there are adequate natural resources management systems and areas of high biodiversity are protected."). In the Andes scenario, we found it in two out of four scenarios (example: "The region has a low carbon economy, the product of having adopted a diversified and sustainable regional agricultural production system, as well as responsible consumption patterns that allow to improve living conditions in the region [...]"). Moreover, we found that two out of the four West Africa scenarios strongly reflect aspects of the sustainable development imaginary (example: "Large projects such as the 'Great Green Wall: Regreening the Sahel' picked up in the 2020s and contributed to plant cover and agriculture in rural areas"). In addition, it was identified in three out of the four East Africa scenarios (example: "Trans-boundary water resource management took a step forward with management agreements for the Lake Victoria basin being established in 2015 and for the Nile Basin being fully implemented by 2025."). Elements of the sustainable development imaginary were found in three out of the five South Asia scenarios (example: "Food security has increased considerably over the last decades. In terms of climate adaptation, the region benefits greatly from the high level of regional coordination."). It was identified four out of four Southeast Asia scenarios (example: "The Southeast Asian Union became a unique institutional entity [...] sharing a common vision on energy, water and natural resources development that leads to effective management, resulting in clean cities, water, safe food and large forest areas."), and in three out of four Pacific scenarios (example: "There is effective governance of natural resources at local, national and regional levels, and more fish and trees are being sustainably produced").

Elements of **regional imaginaries** were found in only three scenario sets. It was found in two out of four Central America scenarios (example: "the education system emphasizes indigenous and ancestral knowledge"), in two out of four West Africa scenarios (example: "Civil society organizations have focused on the development of social capital by taking into consideration traditional structures and values in dialogues to prevent and reduce community conflicts"), and in one out of four Pacific scenarios (example: "In some places root crops and other traditional foods have replaced rice as part of a renaissance of traditional ways of life"). We did not find any references to the **degrowth imaginary** in the scenario sets.

5.1.1. Overall observations

An overall observation was that references to regional imaginaries were scarce and superficial, whereas the neoliberal and sustainable development imaginaries were more interwoven with the scenario narratives. Additionally, we found that all scenario sets challenged conventional views to a degree—more autonomous regional futures (Pacific, West Africa, Central America), as well as more regionally integrated futures (East Africa, South Asia, Southeast Asia, Andes) were explored in the scenarios. The representation of different stakeholder groups—including their agency in the scenario narratives—was limited. In all sets, different stakeholders were mentioned, but only three sets (West Africa, East Africa, Central America) explicitly reference agency of stakeholders.

Another important observation is that there are differences in the way the different imaginaries come to the fore in the scenario sets. While the sustainable development and neoliberal imaginaries are dominant and an intrinsic part of the overarching frame of most of the scenario sets, narrative elements linked to regional imaginaries are oftentimes merely mentioned or described in a very succinct way, for example as an objective or vision specific stakeholders such as regional civil society organizations strive for.

6. Conclusions and discussion

Overall, we found that each scenario set reflects multiple imaginaries to some extent. However, imaginaries that originated in the Global North seem to be dominant over regional narratives—this is in line with our expectations, as these are globally dominant imaginaries, specifically in the realm of agricultural development. In three of the seven scenario sets, we found the articulation of elements of regional imaginaries, but this presence was not very prominent. This is striking, since the scenario sets were developed by stakeholders from the respective Global Southern regions. Moreover, we did not find any expressions of the degrowth imaginary or related ideas in the scenario sets—this can be partly explained by the fact that the CCAFS scenario sets were developed between 2010 and 2013, and degrowth is a relatively recent imaginary that is gaining momentum in recent years (Demaria et al., 2013; Escobar, 2015). In addition, we also observed very few instances of negative disruptive change in the scenario sets. A similar critique has been formulated for the IPCC's Socio-Economic Pathways (SSPs), in which even the 'worst case' scenarios assume growth.

Moreover, we should note that our typology of imaginaries has its limitations. For example, grouping together regional imaginaries does not fully acknowledge their uniqueness and fundamental differences. Also, we could have made different choices regarding the framing of these categories, such as framings focused on economies, social organization, technology, etcetera.

We should also address the fact that the scenario sets significantly differ in terms of extensiveness and level of detail. The scenarios for West Africa and East Africa were the first to be developed under the CCAFS scenarios program, in 2010–2011. These scenario sets are very extensive and pay detailed attention to economic, social, ecological, infrastructural and other aspects. Through experiences gained from applying the scenario sets in decision-making settings, it became clear that there was a trade-off between the length and level of detail of the scenario narratives and its adaptability to different, often national-level, decision-making contexts. This prompted the development of more concise scenario sets for the subsequent regions, allowing for easier adaptability to different decision-making contexts. However, our analysis shows that succinctness of a scenario set may be at the expense of its ability to express a diversity of imaginaries.

Here, we discuss several additional reasons for an under-representation of regional imaginaries in the scenario sets, and provide recommendations for tackling this under-representation.

6.1. A knowledge system dominated by Global North imaginaries

The scenario sets developed in this project were all developed in the context of a global agricultural development knowledge system that was dominated by Global North imaginaries. In the beginning of the project, the value of the scenario work was often called into question, before it expanded to include quantitative modelling methods and alignment with the IPCC Shared Socio-Economic Pathways (O'Neill et al., 2014). This was an existential concern for the CCAFS Scenarios Project—align with the existing knowledge systems or be seen as not credible and get defunded. The project team prioritized a strong fit to the needs of national policy makers in the focus countries especially, in order to achieve concrete policy outcomes. Muiderman (2022) indicates how global foresight systems and national policy systems support each other in maintaining the dominance of Global North foresight approaches.

This dominance of Global North perspectives and framings extended itself to the geographical scope of the scenario sets: the very fact that these were regional scenarios rather than, for instance, scenarios developed at national levels emerged from a Global North research perspective—the idea being that such regional scenarios could offer a bridge between global trends and national concerns; and that food systems often operate regionally (Ingram et al., 2010). The regions themselves were selected and defined based on criteria related to the countries' vulnerability to climate change, rather than—for instance—cultural connectivity. They were selected not just for the scenario project but for a wide range of CCAFS programme activities. As a consequence, countries as culturally and geographically different as Uganda and Ethiopia are both part of what the CCAFS Programme defined as the region of East Africa, and as such, the CCAFS East Africa scenario set encompasses both countries (Vervoort et al., 2013). And although many of the selected regions have their own overarching economic bodies, giving some manner of coherence, they do not necessarily represent a scope that connects to regional imaginaries.

Finally, even though stakeholder groups from diverse sectors were involved in the scenario creation processes, these stakeholder groups were still filtered through existing agricultural development networks. This increased the likelihood of participants in the scenario creation process preferring to explore their scenarios in modes of thinking and imagining derived from the dominant knowledge systems in the realm of agricultural development. Many of the participants had a similar background in terms of training—mostly agricultural biology or agronomy—which may have further contributed to the dominance of Global North imaginaries.

A lack of connection between the explorative scenario mode and regional imaginaries.

A second reason for the rather limited presence of regional imaginaries in the CCAFS scenarios is the goal of these processes to develop *explorative*, rather than *desirable* scenarios. Through scenario planning, systems thinking and navigating uncertainty were brought into policy formulation processes. The scenario sets were designed to 'stress test' policies—the main focus of such scenarios is exploring future contexts in terms of plausible conditions, particularly potential futures challenges. Through questioning the feasibility of a given policy in the context of these plausible futures, insights are gained to make the policy more 'robust' in the face of future uncertainty (Wiebe et al., 2018; Muiderman et al., 2020). Thus, these scenario sets do not necessarily show desirable developments—this was not included as an explicit design criterion. They are meant to be difficult to deal with, to raise questions about existing policies. Reflecting on the CCAFS scenario sets, we conclude that they offer many critiques of and challenges related to neoliberal mechanisms and development dynamics. In fact, it could be argued that what is considered *plausible* in these scenarios is framed by the dominant neoliberal and sustainable development imaginaries.

The entire mode of explorative scenario development/plausible futures is a Global North-based frame. Complex systems and the

need to ‘navigate deep uncertainty’ and so on come from specific, specialist and technocratic Global North research (Louis & Maertens, 2021). Scenarios that are only about future challenges and uncertain developments are a direct result of this line of thinking. By contrast, regional imaginaries such as Buen Vivir and Ubuntu are primarily about *desirable* futures, and as such do not necessarily fit within the dominant frame of exploring uncertainty, i.e., what challenges may lie ahead.

This brings up a very interesting avenue of work for scenario planning—how to create explorative scenarios that explicitly connect to regional or local imaginaries about what could go wrong, what are future risks and uncertainties, and so forth.

However, the presumed dichotomy between explorative and desirable scenarios is a false one, as desirable futures can be ‘plausible’ irrespective. Therefore, desirable regional imaginaries can—and *should*, one could argue—also play a role in explorative scenarios. After all, shifts in societal paradigms away from neoliberal or development modes, while potentially beneficial and desired, could create unexpected new challenges and opportunities in scenarios that could help to question existing policies and strategies, for instance by pushing them to be more creative or ambitious. Through not taking into consideration desirable futures and what questions they offer, scenario sets risk becoming rigid by overemphasizing challenges and threats.

6.1.1. A lack of explicit awareness and use of imaginaries

Independently from these other two factors, a third factor for the limited representation can be said to simply be a lack of explicit focus on imaginaries, i.e., a lack of reflexivity regarding imaginaries. It cannot be predicted what these scenario sets would have looked like exactly with that explicit focus; but with a common understanding of and explicit focus on important societal imaginaries and their alternatives among the participants, more diverse imaginaries would have been likely to have been included.

Building on Ramírez and Selin’s (2014) suggestion to move beyond probability and plausibility, we argue that through emphasizing and stimulating ideas and perspectives that challenge (globally) dominant imaginaries, such as regional imaginaries and the degrowth imaginary, reflexivity regarding imaginaries can be increased. In this way, explorative scenario sets for guiding sustainability governance can be greatly enhanced: it may invoke more creative ideas and make for more compelling scenarios.

7. Recommendations

Explicitly focusing on alternative imaginaries during the development of scenarios, we argue, may lead to more and truly diverse scenarios, and may increase both their substantive and social plurality. Therefore, we encourage scenario planners to be politically reflexive, i.e., self-aware and self-critical and open to multiple societal perspectives on present and possible futures, as well as cognizant of politics and power struggles inherent to participatory scenario planning. As a first step towards this reflexivity, we therefore recommend that scenario planners familiarize themselves with the concept of imaginaries through reading the key publications cited in the theoretical framework of this paper.

A way for scenario planning to more explicitly engage with alternative imaginaries is to include specific characters—for example change-makers or persons representing indigenous communities—and their ideas in the scenario storylines (Burnam-Fink, 2015; Spijkers et al., 2021). Adding characters—with different points of view—can introduce an element of stakeholder agency to scenarios and may help to make explicit different perspectives on elements of the scenario, thereby allowing for different possible framings of the system and problems. Through explicitly exploring which imaginaries underly different stakeholders’ perspectives in a participatory way—e.g., through a deliberative session aimed at unveiling the deeper values and underlying imaginaries. During the actual development of scenarios, these different imaginaries can be built into the ‘fabric’ of the scenarios.

In this regard, Sohail Inayatullah’s Causal Layered Analysis (CLA) (Inayatullah, 1998) is a particularly interesting approach to engaging with imaginaries in scenario planning. This approach aims to elucidate underlying layers and to be inclusive of different epistemic modes, or ways of knowing (Inayatullah, 1993) and to stimulate discussion about the deeper and marginal aspects in imagined futures, and therefore “allows for a range of transformative actions” (Inayatullah, 1998:815). CLA distinguishes four layers in futures thinking: 1) the *litany*, or quantitative trends, problems and events; 2) *social causes*; 3) *structure* and *discourse/worldviews* that underly these social causes; and 4) *metaphors/myths*, i.e. the deep stories, unconscious dimensions and hidden values underlying worldviews. The imaginaries reside in the two deeper layers specifically, and as such, CLA can help elucidate and make explicit from what imaginaries people engaging in participatory scenario processes operate. Through a critical and reflexive exercise, CLA can help “decolonize dominant visions of the future [...]” by “deconstructing particular futures, exploring alternative orderings of knowledge, and genealogies of the present and the future” (Inayatullah, 1998:826). Employing a CLA as a starting point for a scenario planning process, we argue, can help to get people involved in the right frame of mind—by reflecting on and make explicit these layers. To this end, a reflexive stance regarding the epistemic foundations of scenario planning and the dominant role of Western scientism is crucial.

Building on CLA, Milojević and Inayatullah (2015) developed the concept of *narrative foresight*, which concentrates on the stories about the future individuals, organizations, states and civilizations tell themselves, and thereby explores the worldviews and myths that underlie imagined futures. By making and explicit and transforming these stories and underlying metaphors and myths in such a way that they support desired futures, the richness of these narratives can be truly employed to challenge the “official frameworks of meaning” (Milojević & Inayatullah, 2015) brought forward by centers of power that often stem from the Global North. Narrative foresight is a form of reflexive foresight that seeks to question ways of knowing to open up space for imagining alternatives. It emphasizes the story and explicitly links it to planning in an iterative way. Narrative foresight can be utilized in scenario development in a way that explicitly engages with the oft-hidden and collectively held imaginaries that co-exist and compete with each other in society and in the practice of collectively imagining futures. CLA and narrative foresight have the potential to explicitly connect the development of explorative scenario to regional or local imaginaries. We think that through integrating CLA’s focus on deeper layers in futures thinking and genuinely engaging with the stories about the future that are ‘out there’ in a given context, explorative scenario

planning can be improved in terms of its reflexive potential regarding imaginaries. In practical terms, participatory sessions can be incorporated into scenario practices that focus on collectively investigating the deeper layers in the practice of imagining future scenarios, thereby critically interrogating the diversity of narratives expressed in the scenarios and exploring alternative imaginaries.

Taking into account these lessons, futures imagined in scenario processes can be more pluralistic and open up decision-making to alternative and potentially transformational ideas. We encourage future research focusing on how diversity of imaginaries in scenario sets can enhance the quality, for example how a fruitful and representative mix of imaginaries and ideas may lead to new, challenging, and truly pluralistic futures, how it can broaden the space of imagination, possibilities and critique, and how it may allow for scenario planning that leads to more ambitious, rigorous, legitimate and transformational policies and action.

CRediT authorship contribution statement

Heleen Mees: Conceptualization, Supervision. **Joost Vervoort:** Conceptualization, Supervision, Writing – original draft, Writing – review & editing. **Peter Driessen:** Conceptualization, Supervision. **Lucas Rutting:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors of this manuscript declare that no conflicts of interest exist.

References

- Barandiarán, J. (2019). Lithium and development imaginaries in Chile, Argentina and Bolivia. *World Development*, 113, 381–391.
- Beling, A. E., Vanhulst, J., Demaria, F., Rabi, V., & Carballo, A. E. (2018). Discursive synergies for a 'great transformation' towards sustainability: Pragmatic contributions to a necessary dialogue between human development, degrowth, and buen vivir. *Ecological Economics*, 144, 304–313.
- Berger, P. L., & Luckmann, T. (1966). *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. Doubleday & Company, New York.
- Bloom, P. (2017). Milton Park, UK. *The Ethics of Neoliberalism: The Business of Making Capitalism Moral*. Routledge.
- Bond, P., & Dorsey, M. K. (2010). Anatomies of environmental knowledge & resistance: Diverse climate justice movements and waning eco-neoliberalism. *Journal of Australian Political Economy*, 66, 286–316.
- Boulding, E. (1991). The challenge of imaging peace in wartime. *Futures*, 23(5), 528–533.
- Bourgeois, R., Karuri-Sebina, G., & Feukeu, K. E. (2022). The future as a public good: Decolonising the future through anticipatory participatory action research. *Foresight in press*. <https://doi.org/10.1108/FS-11-2021-0225>
- Burnam-Fink, M. (2015). Creating narrative scenarios: Science fiction prototyping at Emerge. *Futures*, 70, 48–55.
- Butler, J. R. A., W. Suadnya, K. Puspadi, Y. Sutaryono, R. M. Wise, T. D. Skewes, D. Kirono, E. L. Bohensky, T. Handayani, P. Habibi, M. Kisman, I. Suharto, Hanartani, S. Supartarningsih, A. Ripaldi, A. Fachry, Y. Yanuartati, G. Abbas, K. Duggan, and A. Ash. (2014). Framing the application of adaptation pathways for rural livelihoods and global change in eastern Indonesian islands. *Global Environmental Change*, 28, 368–382.
- Castoriadis, C. 1975. *The Imaginary Institution of Society*. Polity Press, Cambridge, UK.
- Chaudhury, M., Vervoort, J., Kristjansson, P., Ericksen, P., & Ainslie, A. (2013). Participatory scenarios as a tool to link science and policy on food security under climate change in East Africa. *Regional Environmental Change*, 13, 389–398.
- Childs, J., & Hearn, J. (2017). 'New' nations: resource-based development imaginaries in Ghana and Ecuador. *Third World Quarterly*, 38, 840–857.
- Dator, J. (2005). De-colonizing the future, 1975/ Reprinted in *Journal of Futures Studies*, 9(3), 93–104.
- Demaria, F., Schneider, F., Sekulova, F., & Martinez-alier, J. (2013). What is Degrowth? From an Activist Slogan to a Social Movement. *Environmental Values*, 22, 191–215.
- Edelenbos, J., Van Buuren, A., & Van Schie, N. (2011). Co-producing knowledge: joint knowledge production between experts, bureaucrats and stakeholders in Dutch water management projects. *Environmental Science and Policy*, 14, 675–684.
- Escobar, A. (2015). Degrowth, postdevelopment, and transitions: a preliminary conversation. *Sustainability Science*, 451–462.
- Escobar, A. (2018). *Designs for the Pluriverse*. Durham, NC, USA: Duke University Press.
- Galtung, J. 1990. *International Development in Human Perspective. In Conflict: Human Needs Theory*, edited by J. W. Burton. St. Martin's Press, New York, NY, USA.
- U.N. General Assembly 1992. *Rio Declaration on Environment and Development, Agenda 21*. United Nations Division for Sustainable Development, New York City, NY.
- Gibson, R. B. (2006). Sustainability assessment: Basic components of a practical approach. *Impact Assessment and Project Appraisal*, 24, 170–182.
- Glucker, A. N., Driessen, P. P. J., Kolhoff, A., & Runhaar, H. A. C. (2013). Public participation in environmental impact assessment: Why, who and how. *Environmental Impact Assessment Review*, 43, 104–111.
- Habermas, J. (1996). *Between Facts and Norms: Contributions to a Discourse Theory of Law and Democracy*. Cambridge, MA: The MIT Press.
- Haddad, L. (2008). IDS in focus. *Development Narratives: Recent Trends and Future Needs*.
- M.A. Hajer P. Pelzer in the transition towards renewable energy. *Energy Research & Social Science Energy Research & Social Science 2050 — An Energetic Odyssey: Understanding 'Techniques of Futuring'* 44 2018 222 231.
- Hák, T., S. Janou, B. Moldan, and A.L. Dahl. 2018. Closing the sustainability gap - 30 years after "Our Common Future", society lacks meaningful stories and relevant indicators to make the right decisions and build public support. *Ecological Indicators* 87:193–195.
- Hebinck, A., Vervoort, J. M., Hebinck, P., Rutting, L., & Galli, F. (2018). Imagining transformative futures: Participatory foresight for food systems change. *Ecology and Society*, 23(2), 16.
- Heikkilä, T., & Gerlak, A. K. (2013). Building a conceptual approach to collective learning: Lessons for public policy scholars. *The Policy Studies Journal*, 41, 484–512.
- Herrero, M., Thornton, P. K., Bernués, A., Baltenweck, I., Vervoort, J., van de Steeg, J., Makokha, S., van Wijk, M. T., Karanja, S., Rufino, M. C., & Staal, S. J. (2014). Exploring future changes in smallholder farming systems by linking socio-economic scenarios with regional and household models. *Global Environmental Change*, 24, 165–182.
- Hout, W. (2010). Governance and development: Changing EU policies. *Third World Quarterly*, 31, 1–12.
- Inayatullah, S. (1993). From who am I to when am I. *Futures*, 25(3), 235–253.
- Inayatullah, S. (1998). Causal Layered Analysis: Poststructuralism as a method. *Futures*, 30, 815–829.
- Ingram, J., Ericksen, P., & Liverman, D. (2010). *Food Security and Global Environmental Change*. Milton Park, UK: Routledge.
- Jager, N. W., Newig, J., Challies, E., & Kochskämper, E. (2020). Pathways to Implementation: Evidence on How Participation in Environmental Governance Impacts on Environmental Outcomes. *Journal of Public Administration Research and Theory*, 30, 383–399.
- Jasanoff, S., & Kim, S. H. (2009). Containing the atom: Sociotechnical imaginaries and nuclear power in the United States and South Korea. *Minerva*, 47, 119–146.
- Jasanoff, S., and S.H. Kim. 2015. *Dreamscapes of Modernity – Sociotechnical Imaginaries and the Fabrication of Power*. The University of Chicago Press, Chicago, IL, USA.

- Jost, C., Alvarez, S., Schuetz, T., 2014. CCAFS Theory of Change Facilitation Guide. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), Copenhagen, Denmark. <http://hdl.handle.net/10568/41674>.
- Kochskämper, E., Challies, E., Newig, J., & Jager, N. W. (2016). Participation for effective environmental governance? Evidence from Water Framework Directive implementation in Germany, Spain and the United Kingdom. *Journal of Environmental Management*, 181, 737–748.
- Lejano, R. P., & Ingram, H. (2009). Collaborative networks and new ways of knowing. *Environmental Science & Policy*, 12, 653–662.
- Löfgren, K. 2013,. Qualitative analysis of interview data: A step-by-step guide [Video file]. Retrieved from https://www.youtube.com/watch?v=DRL4PF2u9XA&t=2s&ab_channel=KentL%C3%B6fgren on 2 February 2021.
- Lord, S., Helfgott, A., & Vervoort, J. M. (2016). Choosing diverse sets of plausible scenarios in multidimensional exploratory futures techniques. *Futures*, 77, 11–27.
- Louis, M., & Maertens, L. (2021). *Why International Organizations Hate Politics: Depoliticizing The World*. Routledge.
- D. Mason-D'Croz J. Vervoort A. Palazzo S. Islam S. Lord A. Helfgott P. Havlik R. Peou M. Sassen M. Veeger A. van Soesbergen A.P. Arnell B. Stuch A. Arslan L. Lipper multi-Factor, multi-State, multi-Model scenarios: Exploring Food and Climate futures for Southeast Asia Environmental Modelling and Software 83 2016 255 270.
- Mastini, R., Kallis, G., & Hickel, J. (2021). A green new deal without growth. *Ecological Economics*, 179, Article 106832.
- Milkoreit, M. (2017). Imaginary politics: Climate change and making the future. *Elementa: Science of the Anthropocene*, 5, 1–18.
- Milojević, I., & Inayatullah, S. (2015). Narrative foresight. *Futures*, 73, 151–162.
- Muiderman, K., Gupta, A., Vervoort, J., & Biermann, F. (2020). Four approaches to anticipatory climate governance: Different conceptions of the future and implications for the present. *WIREs Climate Change*, 1–20. e673.
- Muiderman, K. B. (2022). Approaches to anticipatory governance in West Africa: How conceptions of the future have implications for climate action in the present. *Futures*, 141.
- Muwanga-Zake, J. W. F. (2010). Narrative research across cultures: Epistemological concerns in Africa. *Current Narratives*, 1, 68–83.
- Newig, J., Challies, E., Jager, N. W., & Kochskaemper, E. (2018). The environmental performance of participatory and collaborative governance: A framework of causal mechanisms. *Policy Studies Journal*, 46, 269–297.
- O'Neill, B. C., Kriegler, E., Riahi, K., Ebi, K. L., Hallegatte, S., Carter, T. R., Mathur, R., & van Vuuren, D. P. (2014). A new scenario framework for climate change research: the concept of shared socioeconomic pathways. *Climate Change*, 122, 387–400. <https://doi.org/10.1007/s10584-013-0905-2>
- Palazzo, A., Vervoort, J. M., Mason-D'Croz, D., Rutting, L., Havlik, P., Islam, S., Bayala, J., Valin, H., Kadi Kadi, H. A., Thornton, P., & Zougmore, R. (2017). Linking regional stakeholder scenarios and shared socioeconomic pathways: Quantified West African food and climate futures in a global context. *Global Environmental Change*, 45, 227–242.
- Poesche, J. (2019). Coloniality in sub-saharan africa and the americas. *Journal of Developing Societies*, 35, 367–390.
- Polak, F. 1973. The Image of the Future. Elsevier Scientific Publishing Company, Amsterdam, The Netherlands.
- Ramírez, R., & Selin, C. (2014). Plausibility and probability in scenario planning. *Foresight*, 16, 54–74.
- Reed, M. S., Evelyn, A. C., Cundill, G., Fazey, I., Glass, J., Laing, A., Newig, J., Parrish, B., Prell, C., Raymond, C., & Stringer, L. C. (2010). What is Social Learning. *Ecology and Society*.
- Rutting, L., Vervoort, J., Mees, H., & Driessen, P. (2022). Strengthening foresight for governance of social-ecological systems: An interdisciplinary perspective. *Futures*, 141. <https://doi.org/10.1016/j.futures.2022.102988>
- Sardar, Z. (Ed.) 1999. Rescuing All Our Futures: The Future of Futures Studies. Praeger, Westport, CT, USA.
- Shaw, A., Sheppard, S., Burch, S., Flanders, D., Wiek, A., Carmichael, J., Robinson, J., & Cohen, S. (2009). Making local futures tangible — Synthesizing, downscaling, and visualizing climate change scenarios for participatory capacity building. *Global Environmental Change*, 19, 447–463.
- Spijkers, J., Merrie, A., Wabnitz, C. C. C., Singh, G. G., Keys, P. W., & Morrison, T. H. (2021). Exploring the future of fishery conflict through narrative scenarios Exploring the future of fishery conflict through narrative scenarios (Article) *One Earth*, 4, 386–396.
- Stirling, A. (1999). The appraisal of sustainability: Some problems and possible responses. *The International Journal of Justice and Sustainability*, 4, 111–135.
- Stirling, A. 2009. Participation, Precaution and Reflexive Governance. Pages 193–225 in W. N. Adger and A. J. Jordan, editors. Governing Sustainability. Cambridge University Press.
- Taylor, C. (2002). Modern social imaginaries. *Public Culture*, 14, 91–124.
- UNDP. 2014. Foresight as a Strategic Long-term Planning Tool for Developing Countries. Singapore.
- United Nations 2015. The Global Goals for Sustainable Development. <https://www.globalgoals.org/>.
- Vervoort, J., & Gupta, A. (2018). Anticipating climate futures in a 1.5 °C era: The link between foresight and governance. *Current Opinion in Environmental Sustainability*, 31, 104–111. <https://doi.org/10.1016/j.cosust.2018.01.004>
- Vervoort, J. M., Bendor, R., Kelliher, A., Strik, O., & Helfgott, A. E. R. (2015). Scenarios and the art of worldmaking. *Futures*, 74, 62–70.
- Vervoort, J.M., A. Palazzo, D. Mason-D 'croz, P.J. Ericksen, P.K. Thornton, P. Kristjanson, W. Förch, M. Herrero, P. Havlik, C. Jost, and H. Rowlands 2013. The future of food security, environments and livelihoods in Eastern Africa: four socio-economic scenarios.
- Vervoort, J. M., Thornton, P. K., Kristjanson, P., Förch, W., Ericksen, P. J., Kok, K., Ingram, J. S. I., Herrero, M., Palazzo, A., Helfgott, A. E. S., Wilkinson, A., Havlik, P., Mason-D'Croz, D., & Jost, C. (2014). Challenges to scenario-guided adaptive action on food security under climate change. *Global Environmental Change*, 28, 383–394.
- Vincent, A. (2009). *Modern Political Ideologies*. Hoboken, NJ, USA: Wiley-Blackwell.
- Wiebe, K., Zurek, M., Lord, S., Brzezina, N., Gabrielyan, G., Libertini, J., Loch, A., Thapa-Parajuli, R., Vervoort, J., & Westhoek, H. (2018). Scenario development and foresight analysis: Exploring options to inform choices. *Annual Reviews of Environment and Resources*, 43, 545–570.
- World Commission on Environment and Development. 1987. Our Common Future. Oxford University Press, Oxford, UK.