











Research, part of a Special Feature on [Meaningful Transdisciplinary Collaborations for Sustainability: Local, Artistic, and Scientific Knowledge](#)

Envisioning desirable futures in small-scale fisheries: a transdisciplinary arts-based co-creation process

[Ignacio Gianelli](#)^{1,2,3} , [Micaela Trimble](#)^{3,4} , [Silvana Juri](#)^{3,5} , [Nazarena A. Beretta](#)⁶ , [Denisse Torena](#)^{7,8} , [Manuela Acosta](#)⁹, [Robert Acosta](#)⁹, [Mario Del Bó](#)¹⁰, [Jorge A. Fuster](#)^{11,12}, [Vanessa González](#)¹², [Diego Kurta](#)¹³, [Marcelo Kurta](#)¹³, [Tamara López](#)¹⁴, [María E. Marfetán](#)¹², [Pablo Montes de Oca](#)¹⁵, [Alberto Morales](#)¹⁴, [Victoria Pardo](#)¹⁶, [Juan Sandoval](#)¹¹, [Nancy Schuch](#)¹⁷, [Claudio Taroco](#)¹⁸, [Albert V. Norström](#)^{5,19} , [Laura M. Pereira](#)^{5,20}  and [Sebastián Villasante](#)^{1,2,21} 

ABSTRACT. Despite the critical importance of small-scale fisheries for food security and well-being and the role of fishers as stewards of aquatic ecosystems, their future is uncertain. Tackling narratives that portray small-scale fisheries as obsolete, disparate, and inefficient requires collectively imagining and articulating new, creative, and inspiring narratives that reflect their real contributions and enable transformative futures. Drawing on a transdisciplinary country-level case study, we analyze the process and outcomes of co-creating desirable, plural, and meaningful visions of the future for small-scale fisheries in Uruguay. Using an arts-based approach and leveraging the agency of emerging innovative initiatives throughout the country, different food system actors (fish workers, chefs, entrepreneurs) and knowledge systems (local, experience-based, and scientific) were engaged in a creative visioning process. The results of this arts-based co-creation process include (1) a series of desirable visions and narratives, synthesized into an artistic boundary object; and (2) the stepping stones to a transformative space for collective reflection, learning, and action. Although the artistic boundary object has proven instrumental among multiple and diverse participants, the transformative space encouraged academic and non-academic participants to plan collective actions and to feel more confident, motivated, and optimistic about the future of small-scale fisheries in Uruguay. With this paper we provide a tool, a platform, and a roadmap to counter the dominant bleak narrative, while also communicating the elements that constitute desirable futures for small-scale fisheries in Uruguay. On a broader scale, our contribution reinforces the emerging narrative of the key role that small-scale fisheries have, and will play, in local and global food systems.

Key Words: *artisanal fisheries; artistic boundary objects; futures; sustainability initiatives; sustainability transformations*

INTRODUCTION

Small-scale fisheries are globally exceptionally diverse (Short et al. 2021). But despite the richness of fishing practices, fish workers, and contexts, there are two pervasive narratives on what the future of small-scale fisheries holds (Smith and Basurto 2019). One narrative centers small-scale fisheries as obsolete, disparate, disorganized, and inefficient economic systems (St. Martin 2005, Johnson 2006, Overå 2011, Short et al. 2021) that are hardly compatible with modernity, progress, and globalization. This narrative, which often informs fisheries policies, is rooted in modernization and “development” discourse, and builds on a reductionist approach to delimiting the fisheries sector as dichotomous (large vs. small-scale) based on attributes such as vessel size and/or fishing gear. It ignores the inherent diversity, complexity, and dynamics of small-scale fisheries (Johnson 2006), which makes defining small-scale fisheries a controversial and difficult task (Smith and Basurto 2019, Funge-Smith et al. 2023). This narrative uses over-simplistic and techno-economic thinking that places large-scale enterprises or industrial fisheries ahead in the natural succession of fisheries development, thereby contributing to political and institutional marginalization of small-scale fisheries and perpetuating systemic inequities and

injustices (Cohen et al. 2019, Smith and Basurto 2019, Short et al. 2021, Schreiber et al. 2022, Tigchelaar et al. 2022). Although ubiquitous in the Global North (Smith and Basurto 2019), this narrative has spread to become the status quo in some Global South contexts (e.g., Johnson 2006, Overå 2011).

The other narrative, stemming from ongoing social justice and ecological sustainability discourses, place small-scale fisheries as a key, global, diverse, and sustainable contributor to livelihoods and food systems (Cohen et al. 2019). It centers small-scale fishing activities as sources of culture and small-scale fishers as stewards of aquatic ecosystems (FAO 2015, Béné et al. 2015, Bennett et al. 2018, Short et al. 2021, FAO, Duke University and WorldFish 2023). Recent concerted global research and documentation efforts showed that 60 million people are part- or full-time employed along the value chain of small-scale fisheries, making up ~90% of all fish workers (Viridin et al. 2023). Of these, 40% of fish workers are women (Harper et al. 2023), underscoring the importance of small-scale fisheries from a gender perspective. Moreover, up to 492 million people are partially dependent on the activity for food or livelihoods (Viridin et al. 2023), but from a food system perspective (from harvesting to consumption and their respective actors, outcomes, and interactions; Ericksen 2008,

¹EqualSea Lab-CRETUS, Department of Applied Economics, Universidade de Santiago de Compostela, Spain, ²Faculty of Business Administration and Management, Universidade de Santiago de Compostela, Spain, ³South American Institute for Resilience and Sustainability Studies (SARAS), Uruguay, ⁴Unidad de Ciencia y Desarrollo, Facultad de Ciencias, Universidad de la República, Uruguay, ⁵Stockholm Resilience Centre, Stockholm University, Sweden, ⁶Núcleo Interdisciplinario para Estudios de la Pesca del Uruguay (NIEPU), Universidad de la República, Uruguay, ⁷Licenciatura de Diseño de Comunicación Visual, Facultad de Arquitectura, Diseño y Urbanismo (FADU), Universidad de la República, Uruguay, ⁸Historia del Arte, Universidad de Granada, España, ⁹Escuela de Pesca Artesanal, Uruguay, ¹⁰Instituto Uruguayo Gastronómico UG Punta del Este, Uruguay, ¹¹Grupo Pescar, Uruguay, ¹²Pacto Oceánico del Este, Uruguay, ¹³Hermanos Kurta, Uruguay, ¹⁴Cooperativa Pesquera de Consumo Andresito, Uruguay, ¹⁵Restaurante Los Charrúas, Uruguay, ¹⁶Abono de Mar, Uruguay, ¹⁷Almejas Palmares, Uruguay, ¹⁸Jardín Primitivo, Uruguay, ¹⁹Global Resilience Partnership, Stockholm University, Sweden, ²⁰Global Change Institute, University of the Witwatersrand, Johannesburg, South Africa, ²¹Oportunus Research Professor, Universidade de Santiago de Compostela, Spain

Arthur et al. 2022, Tigchelaar et al. 2022), this figure is likely even larger. Within this narrative, small-scale fisheries are increasingly valued for providing social welfare (Westlund and Zelasney 2019), animal protein, and key micronutrients that contribute to food and nutrition security, food sovereignty, and human health (Béné et al. 2015, Mills et al. 2023). Because of this, small-scale fisheries are gaining traction in sustainable development and environmental agendas (Hamilton et al. 2021), encouraging fish workers to explore and navigate pathways to the future (e.g., Saunders et al. 2016, Nthane et al. 2020, Villasante et al. 2021, 2022).

Despite the growing importance of this second narrative, and that the understanding of the contributions of small-scale fisheries to livelihoods, human health, and nutrition is clearer than ever, the predominant narrative of the future is yet to be disrupted. One stepping stone to doing so is to co-create and mainstream visions of viable, possible, and desirable futures for small-scale fisheries. However, thinking beyond predominant ideas of progress and development is challenging. For instance, human cognitive restrictions limit possible scenarios, especially those beyond the status quo (Merrie et al. 2018, Pereira et al. 2019, Hoff 2020, Cork et al. 2023). Providing alternative pathways to the future requires exercising creativity to collectively imagine context-based desirable futures, and how to navigate inclusively toward them. Fish workers and related food system actors, together with civil society organizations and allied academics, must play a primary role in this task.

A key pathway to build inspirational and shared narratives of the future is co-production: an “iterative and collaborative process involving diverse types of expertise, knowledge and actors to produce context-specific knowledge and pathways to sustainable futures” (Norström et al. 2020:183). Co-creation, a specific and “hands-on” co-productive practice, is a powerful and engaging way to elicit the knowledge, values, and aspirations that must underpin desirable futures. Co-creating visions allow for identifying common (and contested) goals and critically assessing change strategies and their implications (both rationally and emotionally), which in turn help in enhancing collective agency (Gaziulusoy and Ryan 2017, Moore and Milkoreit 2020, Kossoff and Irwin 2021, Oomen et al. 2022). As images or stories, co-created visions are compasses to articulate and co-realize actions in the present toward shaping desired futures (Hyysalo et al. 2019, Kossoff and Irwin 2021, Loorbach 2022).

Co-created visions may also act as boundary objects. Star and Griesemer (1989) define a boundary object as something that exists in multiple social worlds, aiding communication between them. It possesses a distinct identity within each world, requiring both concreteness and abstraction, as well as fluidity and definition (see also <https://scalar.usc.edu/works/boundary-objects-guide/>). The embodiment of desirable visions into artistic, co-created artifacts produces powerful boundary objects (hereinafter “artistic boundary objects”) that fit the features and purposes described by Star and Griesemer (1989). Artistic boundary objects (e.g., illustrations, 3D objects, audiovisuals) connect diverse actors with various worldviews, needs, types of knowledge, and values into projective artistic pieces and narratives that can bridge the future to the present (Rathwell and Armitage 2016, Pereira et al. 2020). Thus, when compared to other

types of boundary objects (e.g., maps, online platforms, concepts), artistic boundary objects stand out for their robustness and usefulness (Zurba and Berkes 2014, Rathwell et al. 2015, Rathwell and Armitage 2016). For instance, Rathwell and Armitage (2016) demonstrated how artistic boundary objects served as shared reference points to connect different social worlds and as means to bridge intergenerational and local-global gaps. Moreover, based on a participatory art process with Indigenous peoples, Zurba and Berkes (2014) argued that artistic boundary objects are not merely “snapshots,” but cultural processes/products capable of fostering ongoing discussions and connecting disparate actors toward a common long-term goal. Thus, artistic boundary objects also hold the potential to become part of the communication, collaboration, and cooperation processes within participatory research (Singh 2011), forming and expressing the social identities of the people or groups that share a boundary object (Gal et al. 2004, Zurba and Berkes 2014).

With this as background, in this paper, we analyze and reflect on the process and outcomes of the co-creation of plural and desirable visions for small-scale fisheries in Uruguay. Embedded in an ongoing and country-level transdisciplinary case study that engages key actors of the food system, artists and researchers, we used an arts-based method (Collaging Futures) to envision preferable futures. The visioning process had two main goals. First, to provide a concrete output—an artistic boundary object—to serve as a compass for articulating collective actions. Second, to act as a key step in consolidating a space to spark sustainability transformations for small-scale fisheries in Uruguay. For the purposes of this study, we assessed the impacts of the co-creation process through two sequential reflection activities and by categorizing participants’ perceptions into a five-level incremental indicator system: confirmational, educational, instrumental, projective, and motivational impacts. We then reflect on and discuss the main implications of these results for the food system linked to small-scale fisheries in Uruguay, as well as the insights and limitations of conducting an arts-based transdisciplinary collaboration aiming for transformative change. Overall, the paper provides an illustrative example of how co-creating novel, desirable, and meaningful visions can challenge dominant narratives and serve as a starting point toward enabling sustainability transformations in small-scale fisheries.

BACKGROUND AND RATIONALE

The need for a new narrative in small-scale fisheries of Uruguay

The modernization discourse (Johnson 2006) has shaped the trajectory of the fishery sector in Uruguay, with the state playing both a leading and enabling role (see Astori and Buxedas 1986, Etchebehere and Geymonat 2018). Through providing economic incentives (e.g., fuel and exports subsidies, soft loans) for large-scale fleet expansion, an industrial fishing sector has rapidly been consolidated (Gianelli and Defeo 2017). In doing so, small-scale fisheries have been down-prioritized in governmental development plans and their socioeconomic relevance and socio-cultural values have been neglected. Nevertheless, few efforts to promote organizational capacities within small-scale fisheries have been fostered by local, national, and international actors although these did not yield positive long-term results (Bértola et al. 1996, Etchebehere and Geymonat 2018). Overall, social dimensions have rarely been considered in small-scale fisheries

management and governance (Trimble and Johnson 2013, Lagos et al. 2019). As a result, the small-scale fishing sector lacks recognition as a viable and prosperous activity, which feeds the narrative that it is subordinate to the export-focused industrial fishing model (Etchebehere and Geymonat 2018). This historical legacy is reflected in market and technological interdependencies between small-scale and industrial fleets, for example, by sequentially targeting some of the same species (Horta and Defeo 2012) and small-scale actors often being forced to operate within industrial value chains, often via vulnerable, informal channels (Etchebehere and Geymonat 2018). Also, the fishing sector has overall been diminishing in economic importance in Uruguay (Gianelli and Defeo 2017). In light of this, political marginalization of small-scale fishing has been exacerbated, and has perpetuated societal perception of small-scale fisheries as a fringe activity (Santos et al. 2021). Today, fish consumption in Uruguay is small (~7.7–9.23 kg/year per capita: FAO 1997, Bove and Cerruti 2008) and there are scarce incentives for investments in small-scale fishing (e.g., equipment, technology, and vessels). This cements the view of small-scale fisheries as unimportant. Taken together, these factors have hindered shared narratives about the salience and future viability of small-scale fisheries. This bleak narrative is reflected, for example, in the desire of many fishers that their children not follow in their path because they believe that fishing will not be a viable occupation in the future (Trimble and Johnson 2013, Zurba and Trimble 2014).

We argue that a stepping-stone toward consolidating a viable and just space for small-scale fisheries in Uruguay is, therefore, to create new visions capable of challenging dominant narratives. “Fishing Transformations” (*Pescando Transformaciones* in Spanish) is a country-level transdisciplinary project (<https://sarasinstitute.org/fishing-transformations/>) that aims to create a transformative space (Pereira et al. 2018a, 2020) to envision and enact transformative pathways for small-scale fisheries (Gianelli et al. 2022). A transformative space is a collaborative and “safe enough” environment that aims to enable change toward sustainability (Pereira et al. 2020). By bringing together diverse actors into dialogue and reflexive learning, solution-oriented pathways can be co-created and co-realized (Pereira et al. 2020). The “safe enough” characteristic refers to the balance between creating a level of openness and trust while convening these spaces, but also challenging participants to articulate their differences, often inducing some level of discomfort (Pereira et al. 2020). To this end, our project brings together diverse actors in the small-scale fisheries system, artists and researchers, and integrates knowledge systems and territories to promote collective learning, agency, creativity, and empowerment through diverse and plural approaches. Specifically, the project leverages the creativity and disruptive capacity of design and arts-based practices with scientists in the role of transformative space-makers (holding capacity, networks, time, and space to analyze sustainability).

The Fishing Transformations project originated in 2019 during the “Food and Sustainability” thematic cycle organized by the South American Institute for Resilience and Sustainability Studies (SARAS), in Uruguay (see Juri et al. 2022). Motivated by the question “What experiences, experiments, or initiatives are identified as promising or with transformative potential for

fisheries food systems?” a transdisciplinary group discussed and imagined sustainable strategies for fisheries in Uruguay laying the ground for the Fishing Transformations project. SARAS provided a valuable platform for initiating this transdisciplinary collaboration based on its foundational pillars that include integrating a broad range of innovative approaches, combining disciplinary domains, co-creating and co-producing knowledge and solutions based on plural and diverse visions, and fostering art-science interactions (Paasche and Österblom 2019, Scheffer and Mazzeo 2019, Calderón-Contreras et al. 2022).

The project started by identifying local experiences, experiments, or initiatives (hereinafter “sustainability initiatives” sensu Lam et al. 2020) that provide new ways of thinking, doing, and organizing in the small-scale fisheries food system that have transformative potential. The adoption of a food system perspective opened opportunities to engage diverse actors acting at/across different stages of the small-scale fisheries value chain (e.g., harvesting, processing, waste-management, etc.), enabling diversity of perspectives. Eleven sustainability initiatives across Uruguay were identified based on their agency and interest in shaping change toward sustainable futures (Table 1; see methodological details in Gianelli et al. 2022). These initiatives operate at a niche level, but display the potential to grow and benefit local communities and inspire change on broader scales based on innovative products, practices, and ideas. The participants (or leaders) of the sustainability initiatives were diverse, including small-scale fishers, fish processors and distributors, technical consultants of fishing organizations, chefs, cookery instructors, and environmental entrepreneurs. Moreover, the initiatives were dispersed across Uruguay and involved several ecosystems (rivers, coastal lagoons, estuaries, sea coasts, and sandy beaches) and associated context-specificities (e.g., type of vessels and fishing gear, level of market integration). The building block to engage initiatives in a transdisciplinary process was to hold meaningful individual conversations with their leaders to identify and understand their personal and collective experiences, motivations, and goals, as well as to explain the rationale and purpose of such a transdisciplinary process. To tackle the lack of clear pre-existing bonds between several of the initiatives, their innovative nature and a set of shared strategies and goals were portrayed as the “social glue” that connects them (Gianelli et al. 2021). For building trust and for the collaboration to gain credibility, as soon as they engaged, sustainability initiatives were immediately rewarded by enhanced public visibility and social recognition and reinforcement (see details in Gianelli et al. 2022 and a concrete example in Gianelli et al. 2021). Overall, the Fishing Transformations project is framed in an enabling perspective to transformations (Pereira et al. 2018b, Scoones et al. 2020), i.e., elevating innovative initiatives beyond the niche level and empowering them to take individual and collective small actions that collectively, over time, may challenge dominant narratives.

METHODS

An arts-based transdisciplinary process to co-create visions

Because transformations represent not only cognitive or technical challenges, but also creative ones (Gaziulusoy and Ryan 2017), leveraging the imaginative and disruptive capacity of art emerges as a promising way to spark and democratize creativity within

Table 1. Sustainability initiatives in small-scale fisheries involved in the Fishing Transformations project. Modified from Gianelli et al. (2022).

Initiatives	Initiative description	Visioning workshop (in-person)	Follow-up workshop (online)
Armonía	An enterprise that uses environmentally friendly fishing gear and maximizes process efficiency and seafood quality. The initiative supplies local and fresh fish to restaurants in Punta del Este.	Two fishers	One fisher
COOPESCONAND (Cooperativa Pesquera de Consumo Andresito)	Fishers' cooperative that, through the technologicalization of post-harvest processes and organizational strengthening, promotes the consumption of freshwater fish and enhances the value of inland small-scale fisheries in Uruguay.	One fisher and a vet	A vet
Escuelita de Pesca Artesanal	A family-based project that revalues small-scale fisheries by perpetuating Punta del Diablo's fishing heritage and providing added value to local seafood.	A fisher and his daughter (undergraduate student)	A fisher and his daughter (undergraduate student)
Grupo POPA (Por la Pesca Artesanal de Piriápolis)	A participatory action-research group that provided a space for knowledge exchange, looking for solutions to local problems among fishers, researchers, and other actors related to small-scale fisheries in Piriápolis.	A chef and a researcher	A chef and a researcher
Hermanos Kurta	A family-based enterprise that targets coastal fish species maximizing product quality, processing, and storage techniques. The initiative, based in Playa Verde, supplies local and fresh fish to restaurants in Montevideo.	Two fishers	One fisher
Jardín Primitivo	A family-based enterprise that transforms seafood waste from small-scale fisheries in Punta del Diablo into organic compost.	An entrepreneur	An entrepreneur
Pacto Oceánico del Este	A project that strengthens the links between fishers, chefs, and consumers, disseminates information about local fishing, and educates early childhood to promote changes in fish consumption patterns.	A chef and a fisher	A chef and a fisher
Abono de Mar	An enterprise that transforms seafood waste from small-scale fisheries in La Paloma into organic compost.	†	An entrepreneur
Almejas Palmares	A family-based enterprise in Palmares de La Coronilla that harvests, processes, distributes, and sells yellow clams to restaurants of multiple locations.	†	A fisherwoman
Aquí se Pesca, Aquí se Cocina	A gastronomic festival that revalues small-scale fisheries culture and promotes local seafood consumption.	†	†
Cocina de La Barra	Associative gastronomic enterprise led by fisherwomen that adds value to local seafood in Rocha Lagoon and maintains its cultural identity.	‡	‡

† Members of the initiative were not able to participate.

‡ Members of the initiative were invited but decided not to participate in either of the workshops.

transformative spaces. Arts-based creative practices also enhance understanding through making with our hands (Langley et al. 2018); they enable the integration of diverse types of knowledge (Tengö et al. 2014, Delgado and Rist 2016, Leavy 2020, Chambers et al. 2021), and allow participants to explore what needs to be created and dismantled (Hyysalo et al. 2019, Fry and Tlostanova 2020). Moreover, collective visions can lead to alignment in terms of values and goals, necessary for systems-level transformation (Bui et al. 2016, Öztekin and Gaziulusoy 2021).

To co-create a series of desirable future visions for small-scale fisheries in Uruguay, a novel arts-based visioning method (“Collaging Futures”) was implemented (Ortega-Pallanez et al. *unpublished manuscript*). The method is grounded on a non-linear and more plural consideration of temporality and the possibility to resonate with, and value, diverse cosmologies and worldviews. In particular, it seeks to leverage the plural pasts and histories that make different worlds (de la Cadena and Blaser 2018, Escobar 2020), but also to transcend and “filter” techno-centric visions that are often determined by values and ideas of progress that stem from the Global North (Moguel 2015, Cork et al. 2023). The method was designed to enable participants, especially those without a background in creative or artistic practices or experience with visioning, to collectively imagine locally meaningful futures as a co-creation process that bridges diverse pasts and futures (Vaughan 2005, Leavy 2020). Collage was chosen as a metaphor for the dynamic assemblage of perspectives, practices, and values derived from different “worlds”

(Brockelman 2001, Deleuze and Guattari 2005). The technique allows for the transcendence of textual and verbal means of communication, and the preservation of diversity and difference (Norris 2008). It also enables a process of collective meaning-making and shaping of a new narrative.

The visioning exercise took place in a 2-day workshop (17 and 18 May 2022) held at SARAS’ venue. Visioning workshop participants (n = 17) included members from seven sustainability initiatives (Table 1), researchers, and artists. The time horizon for visioning was set at about 30 years (~2050), far enough into the future for meaningful transformations to occur, while still close enough to be relatable to actions and interventions needed in the present. The visioning exercise was purposefully focused on positive and desired futures because inspirational visions can act as the backbone of transformative pathways (van der Helm 2009) by enabling a collectively agreed-upon compass on which to articulate and foster actions today. Thus, the exercise was not targeted to solve a predefined problem, but to identify and enable collective forms of agency (Chambers et al. 2021). Researchers selected this approach to co-create a specific output (an artistic boundary object), in the form of shared desirable futures, capable of engaging disparate actors and fostering the continuity of the transdisciplinary process (Rathwell and Armitage 2016). The workshop dynamic heavily relied on a previous process that paved the way for building trust and making participants comfortable and safe (Gianelli et al. 2021, 2022), a precondition for enabling a transformative space.

The visioning exercise consisted of four steps: (1) harvesting the past; (2) selecting and negotiating a collective library of images; (3) filtering the present; and (4) reassembling future worlds. Each step involved the use of canvases (designed worksheets) that helped each working group to collaborate and fulfill the premises of the exercise (Fig. 1). To maximize interactions, ensure diversity and participation, and also pluralize outcomes, participants were divided into two working groups of 7–8 people. A facilitator trained in Transition Design (Irwin 2018) tools guided both groups during the entire exercise, while each working group included a researcher who had been briefed on how to guide the exercise beforehand.

The process was facilitated as follows: The first step (Harvesting the past) sought to “go back” to the past to explicitly nurture and inspire futures rooted in specific territories and their traditional and ecological knowledge systems. Elements of the past were harvested in the form of images. These elements served the purpose of supporting and expanding the scope of thinking in terms of what elements could be used to craft a new vision

Fig. 1. Visioning exercise for co-creating desirable visions for the future of the food system around small-scale fisheries in Uruguay, using Collaging Futures arts-based method.



(ingredients for world building). Elements included, but were not restricted to, objects, institutions, traditions or practices, meanings/ideas, and societal or governance arrangements, either related or not to small-scale fisheries. In the second step (Selecting and negotiating a collective library) participants were asked to share the reasons for selecting each element and collectively to identify and negotiate (aiming for consent rather than consensus) a set of elements that could resonate or be a good-enough starting point for the whole group. This allowed for different perspectives, stories, and personal (affective) memories to be brought to the table. During the third step (Filtering the present) participants were asked to focus and identify elements of the present that they deemed (1) worth preserving or expanding; (2) best abandoned; and (3) possibly transformed or replaced by elements of the past or other novel ideas. The fourth and final step (Re-assembling future worlds) consisted of collectively assembling a future vision using the technique of collage. Participants were prompted to revise and explore the elements and ideas that emerged in the previous steps and attempt to freely and playfully combine, re-order, and edit all the elements to visually “compose” a future “world.”

After the collages were completed, each group worked on a narrative description and proposed a tentative name for their future vision. Finally, the two groups shared the resulting collages and narratives with the rest of the workshop participants. Notes were taken by the facilitator and a visual artist to capture existing convergences and synergies between the two visions. These were later integrated and used to craft a meta-vision to distill the key messages from the two collage-based visions, as well as the ideas that emerged during dialogues and plenary reflections throughout the visioning exercise. The narrative of the meta-vision was written by the first author and shared with workshop participants so that changes and adjustments could be made. The resulting image constitutes an additional layer of synthesis, integration, and visual interpretation of the content and essence of a shared vision for small-scale fisheries futures in Uruguay. As such, this meta-vision acts as an artistic boundary object, an art piece, that connects diverse knowledge systems, food system actors, and territories, being sufficiently robust to maintain a shared identity, yet flexible enough to resonate with and adapt to local realities (Rathwell and Armitage 2016).

Last, a participatory backcasting exercise (Dreborg 1996), part of the Transition Design toolkit (Irwin 2018, Juri et al. 2021), was conducted to identify a series of concrete and plausible multi-scale actions (i.e., individuals, family/household, neighborhood, city, region, and planet) in the short and long term to navigate toward desired futures (Wiek and Iwaniec 2014). Such actions may target system-level changes such as policies, regulations, socio-cultural practices, traditions, and values, as well as local-level changes such as actors’ partnerships, infrastructure, and modes of production or marketing. After allowing participants to brainstorm on actions based on these categories, facilitators prompted participants to select, combine, or propose a series of potential actions to embark on within the Fishing Transformations project, as a way of assuming commitments and responsibilities and having a concrete collective roadmap.

Evaluating impacts of the co-production process

Participants' reflections about the co-production impacts were gathered through two sequential reflection activities: during the visioning workshop itself and after four months through an online workshop (Table 1). Once the visioning exercise was completed, participants were asked to think introspectively about their previous ideas about the future of small-scale fisheries and reflect on the visioning workshop. In addition, retrospective reflections were collected through an online workshop held in October 2022, where participants ($n = 15$) were divided into break-out sessions to gather their perspectives on the impact of the co-created vision and the transformative space. The online workshop included the "vision co-creators" (i.e., those who participated in the visioning exercise) and other participants who, for practical and logistical reasons, were unable to attend the visioning workshop despite being active members of the project (Table 1). Accordingly, the follow-up workshop included two participant groups with different, yet overlapping, experiences of the co-production process. This situation provided an opportunity to test whether the meta-vision, as an artistic boundary object, was relatable to other actors that were not directly involved in its creation.

Participants' statements were deductively coded following Wall et al. (2017) into a five-level impact indicator gradient (i.e., confirmational, educational, instrumental, projective, and motivational) using Atlas.ti (Version 9.1.6). The "confirmational" impact indicator describes situations where information, perceptions, or positions previously held by participants were verified or reinforced either through co-producing the vision and/or participating in the transformative space. The "educational" indicator refers to participants perceiving themselves to be better informed or having acquired new knowledge about a general or particular issue. "Instrumental" impacts suggest the use of outputs and the incorporation of new skills or methodologies (and their planned use within and beyond the transformative space). The "projective" indicator points to participants having a better and more comprehensive understanding of possible futures. Last, "motivational" impacts imply participants being engaged and motivated in long-term collaborations. Following Malmborg et al. (2022), the analysis of the impacts of the co-production process was based on the number of participants that expressed either confirmational, educational, instrumental, projective, or motivational impacts. Impacts were differentiated by when participants reflect on them (either the visioning or follow-up workshops) and the specific reason underlying the impact (either the boundary object or transformative space). To illustrate participants' experiences, the analysis of the impact indicators is accompanied by direct quotes (translated from Spanish to English by the first author).

RESULTS

Visions and actions for small-scale fisheries futures

Two desirable visions for the future of small-scale fisheries in Uruguay were embodied in separate collages (Fig. 2). Working groups used different strategies to assemble the collages, and this creativity also allowed for freedom to discover and make disparate connections that could challenge the status quo. For instance, the collage entitled "The indivisible of the collective" has in its core an intimate connection between small-scale fishers, markets, and chefs; a bond represented with a handcrafted fishing net (Fig. 2A). The remaining elements were arranged peripherally, with

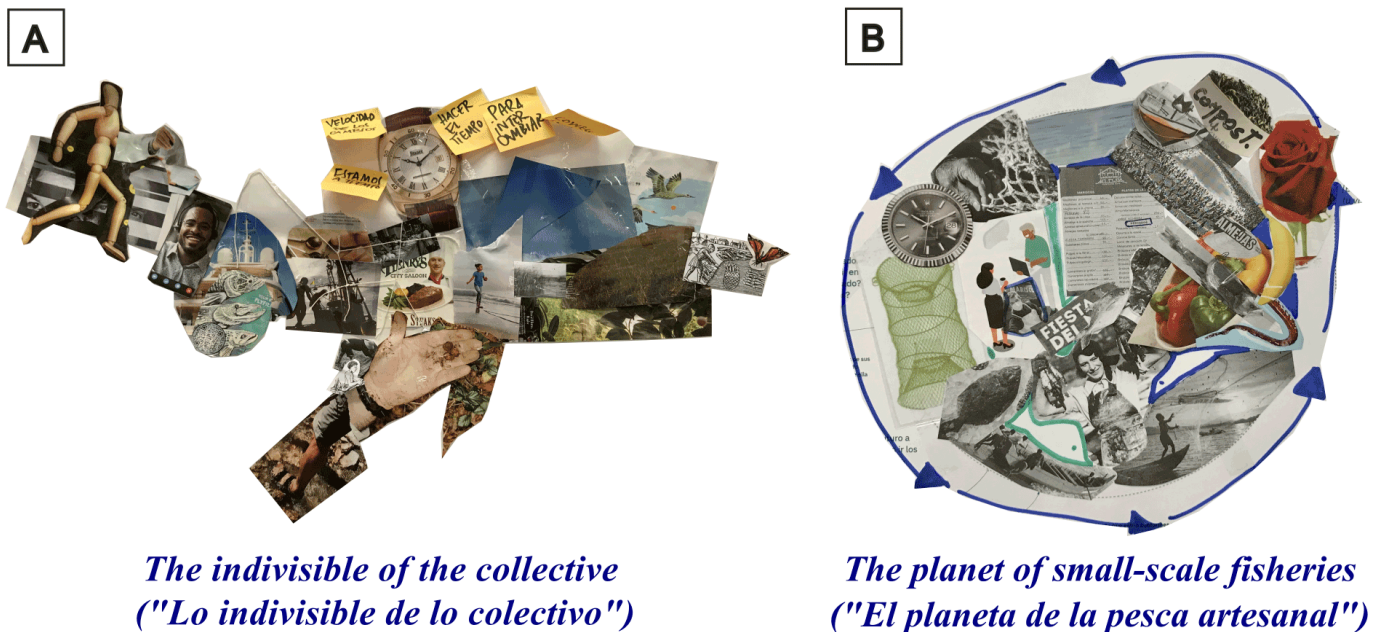
time occupying a central position. On the other hand, elements within the collage entitled "The planet of small-scale fisheries" are circumscribed into a circle made of arrows that highlight the systemic nature of small-scale fisheries and the ambition to implement a circularity approach into all stages of the food system (Fig. 2B).

Both collages share many elements, including time as a metaphor, the role of gastronomy, the importance of children, and the improvement of institutional frameworks (Fig. 2). Time, represented by a clock in both collages, had multiple context-specific meanings and metaphors, including the time that actors invest in participating in transformative spaces, and the time required to overcome the inertia and for transformative change to occur. Another key interpretation of time was the mismatch between bureaucratic (slow) times and fishers' (often immediate) needs. Collages moreover emphasized children being nurtured from relational experiences with nature, contributing to intergenerational equity, knowledge transmission, and, overall, to build futures where societies value nature in diverse ways (Fig. 2). Another common element was hand-made fishing nets as a metaphor for the value of artisanal practices that may contribute to moving away from, in participants' own words, a "throw-away society." Other elements appeared only in one collage, such as the need to incorporate new digital technologies and implement a more flexible and dynamic regulatory framework for small-scale fisheries (Fig. 2A), as well as diversifying fishing gear, acknowledging small-scale fishers as cultural icons, and transforming fish waste into organic compost (Fig. 2B).

The conceptual and metaphorical ideas explored through the collages were captured in a more literal (representational) language through illustration of a meta-vision centered on "Collective over individual work" (Fig. 3). This acts as an artistic boundary object that can be relatable not just to those involved in its creation, but also to others within and beyond the transformative space. The main messages included in the meta-vision were (in a clockwise direction in Fig. 3): "Support from and coordination with authorities," "Incorporating new technologies," "Species diversity," "Not losing the artisanal traditions," "Making women's role visible," "A more balanced diet," and "Environmental stewardship." The central "Collective over individual work" reflects multiple meanings, first, the process of building a coalition among the sustainability initiatives themselves, and second, the presence of novel incentives that foster associative and organizational capacities both within fishing communities, and across food system actors. For instance, new financial and marketing opportunities that foster small-scale fisheries associations or cooperatives (Lagos et al. 2019, Gianelli et al. 2022), and novel relations between chefs and small-scale actors (including fishers) based on the premise that local and sustainable products are critical ingredients for "good" cuisine and "delicious" food (Evans et al. 2015). Consequently, a culinary identity, one that includes local fishery resources, is being consolidated in Uruguay (Laborde 2022).

Although this link between chefs and small-scale fishers is visible in the meta-vision and represents an ongoing pathway to change, at the household level however, consumers face several barriers to fish consumption. These include lack of culinary skills, rejection of fish because of taste preferences, high price and low availability (especially in inland areas) (Machin et al. 2018). To

Fig. 2. (A) The indivisible of the collective: “By the year 2050, cooperation networks between local actors and short market chains characterize small-scale fisheries in Uruguay. Aquatic ecosystems (coasts, rivers, lagoons) are healthy, abundant, and diverse, surrounded by native vegetation and fauna: indispensable scenarios for the upbringing of future children. Healthy foods, local fishery resources, traditional practices, the use of natural materials, and the exchange of information are elements valued by fishers and consumers alike. People devote more time to home cooking, encouraging a more balanced diet in which fish plays a leading role. The safety and efficiency of small-scale fishing activity have been improved because of the incorporation of accessible technologies. The regulatory framework is adaptive and has opened new opportunities for small-scale fisheries such as fishing tourism”; (B) The planet of small-scale fisheries: “Uruguay, 2050. Small-scale fisheries are part of a healthy, diverse, and sustainable food system, where a circular economy logic is present in all stages and fish products. Thanks to the knowledge transmission from fishers (both men and women) to children and society, small-scale fisheries have gained visibility and thus, are now a significant component of the country’s culture and identity. Multiple festivals in different localities of Uruguay commemorate Small-scale Fisheries Day. Small-scale fishers have adopted selective fishing methods and gear, and have improved processing, favoring product quality and environmentally friendly practices. Gastronomes and small-scale fishers have consolidated a relationship of trust based on information exchange, the pursuit of product quality, and commitments on both sides. The institutional framework is efficient, not very bureaucratic, and in line with local needs. Small-scale fisheries are managed as social-ecological systems, in which local and traditional knowledge are complemented by technical and scientific knowledge for fishery resources management.”



tackle these barriers, the meta-vision includes pathways to potential cultural shifts due to the active involvement of children and schools and the potential of any cook, from amateurs to professionals, to become change makers. By increasing fish consumption and challenging current eating habits (Uruguayans annually consume 10 times more meat [90 kg/year per capita: INAC 2021] than fish), the meta-vision explicitly tips the scale in favor of “A more balanced diet” (Fig. 3).

The meta-vision is also populated by multiple and interconnected actors (e.g., fishers, gastronomes, decision makers, school teachers, children, and society) and non-human entities (e.g., aquatic environments and their biodiversity) showcasing how diverse the small-scale fisheries local food system is. Contrary to this reality though, small-scale fisheries in Uruguay are operationally defined by a unidimensional and reductionist quantitative metric (vessels with less than 10 Gross Register Tonnage) that lump together both ends of a wide range of small-scale fishing contexts: from subsistence to almost “semi-industrial” fishing (Etchebehere and Geymonat 2018). In between

these extremes, fishing occurs in diverse aquatic environments (e.g., coasts, estuaries, rivers, lagoons, sandy, rocky shores/reefs) using diverse gear (e.g., gillnets, traps, pots, longlines, hookah systems) and practices: some are indeed from a small vessel, while others are barefoot shell fishing or hookah diving. Such diversity translates into ~50 species of freshwater, brackish, and marine finfish and shellfish being landed by small-scale fisheries (“Species diversity” in Fig. 3; Gianelli et al. 2018), most of which are undervalued and unknown to consumers.

For a boundary object to be meaningful in such a diverse context, its meanings must be subject to constant negotiation, reconstruction, and resignification. For example, after a first draft, a fisher requested to expand the portfolio of “Species diversity” within the meta-vision to include the one she targets. Also, the meta-vision includes potentially conflicting perspectives of workshop participants, such as those advocating for maintaining the artisanal traditions and those who called for novel technologies (“Not losing the artisanal traditions” and “Incorporating new technologies” in Fig. 3). Even though these somehow contrasting positions were reconciled

Fig. 3. Collective over individual work: “Uruguay, 2050. Small-scale fisheries are conceived as protagonists, diverse, equitable, connected, circular, and part of a viable food system, where the collective prevails over individual work. Each societal actor in the system is responsible for sustaining the collaboration networks that connect and make visible fishermen and fisherwomen, chefs, authorities, citizens, and consumers. Gastronomy has facilitated a paradigm shift in the kitchens and diets of Uruguayan citizens. This mindset shift was also possible because of efforts at school and household levels aimed at changing eating habits, mainly in children and early childhood. The consumption of animal protein is more balanced, which translates into improved children’s and adults’ nutrition alike, and the sustainability of lands, rivers, and coasts. The ecological sustainability of small-scale fisheries is favored by citizen environmental awareness and stewardship, the use of selective fishing gear, and the valorization of diverse species, which reduce fishing pressure on traditional fishing resources. New technologies have been incorporated for navigating, capturing, processing, and fish marketing, although characteristic elements of artisanal fishing have been safeguarded, such as the significant labor force, the manual work of men and women, and the small-scale nature of the fishing operations. The viability of small-scale fishing has been possible by the support of government authorities, who, through the different dependencies, maintain effective coordination that allows the system to function efficiently and adaptively.” Illustration by Denisse Torena (@asihacedenis).



through dialogue during the visioning workshop, they were both portrayed in the meta-vision to ensure pluralism in future visions, and for the boundary object to be relevant for the diverse project participants.

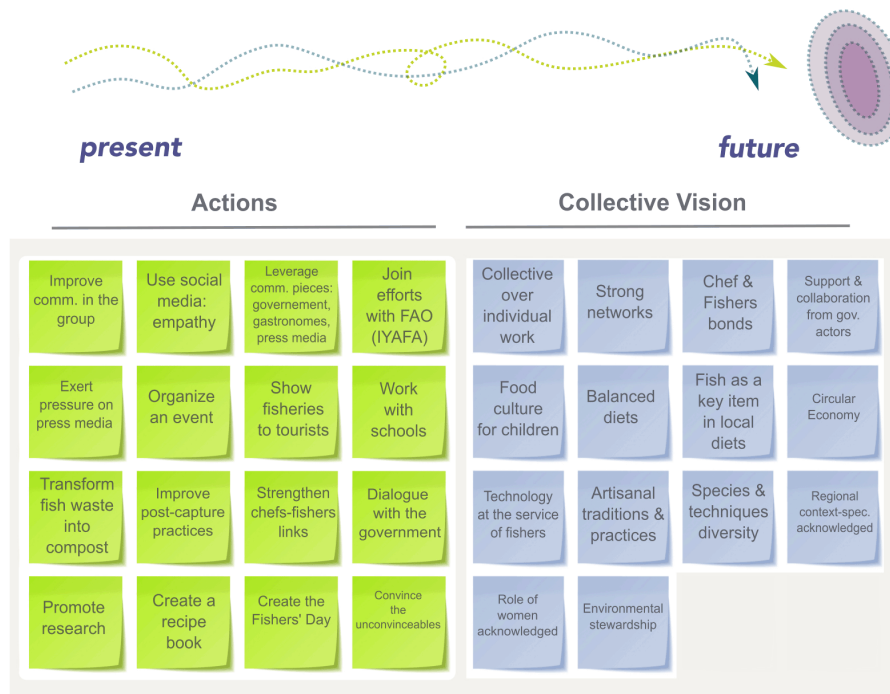
Besides the instrumental use of the boundary object within the transformative space, the meta-vision also speaks to, and seeks to engage with, a broader audience. However, visions need to be tangible for people to engage with them (Wiek and Iwaniec 2014). This could, for example, include linking the meta-vision to local and global recommendations for healthy and sustainable diets, e.g., to include fish once per week and reduce meat consumption (MSP 2019, Willet et al. 2019). These recommendations are well aligned with several elements of the co-created visions, including the active involvement of children to promote cultural and dietary shifts and the transformative potential of gastronomy (Fig. 3).

A set of prioritized actions to navigate toward desired futures was identified at the visioning workshop. These ranged from tangible immediate actions (e.g., sharing contact information between

workshop participants to facilitate dialogue after the workshop) to more transformative, yet complex, actions such as revaluing small-scale fisheries culture in Uruguay (Fig. 4). Other proposed actions aimed to improve specific practices such as handling and processing of fish, transforming fish waste into compost, and strengthening the bonds between chefs and fishers. Last, a subset of actions was intended to move beyond the “safe-enough” nature of the transformative space and “convince the unconvincibles” by exerting pressure on social media and in the press, and establishing dialogue channels with governmental actors. A bundle of actions was collectively prioritized as the next steps to take. These included adopting a communication platform for future collective activities, using existing communication pieces to reach national and local governmental organizations, educational institutions, and the press, and planning a public event to showcase the work carried out within the transformative space.

Following the visioning workshop, some promising signs of long-term engagement emerged. First, a shared platform for day-to-

Fig. 4. Proposed actions identified through the participatory backcasting exercise to navigate toward desired futures. The figure was adapted from the synthesis report “Cambios transformadores en la pesca artesanal: visiones y acciones para un futuro deseable” (https://saras-institute.org/wp-content/uploads/2022/07/Reporte-Encuentro_Pescando-Transformaciones-2.pdf) and translated to English. Proposed actions are represented in green post-it notes whereas elements that constitute desirable visions are represented in blue notes.

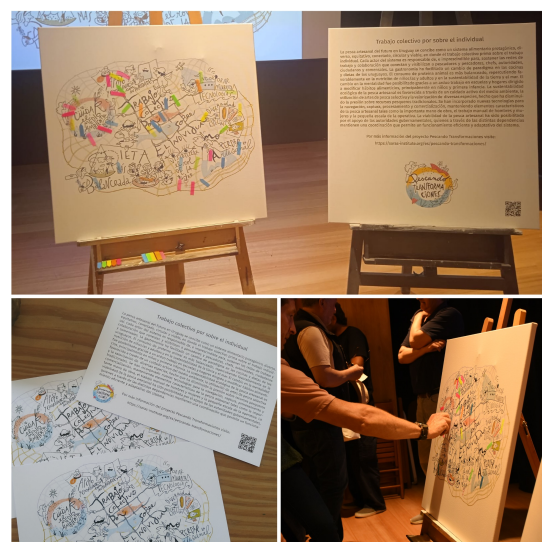


day communication and for activities coordination was collectively agreed and established (i.e., a WhatsApp group). At the time of writing (January 2024), this platform represents an active key communication channel where news is shared, as well as support and advice are sought. Second, a short film that integrates the personal experience of each sustainability initiative and the process of co-creating visions was produced (<https://youtu.be/ZtEX1GbEG-Q?si=qxk3snUi5Z9Fw4Rk>) and launched at public events that targeted key stakeholders and governmental actors (<https://youtu.be/mBYYj6QpVeg>). The artistic boundary object—the meta-vision—was used both in the short-film and public events (e.g., film screening, talks, conferences) to connect food system actors by setting a common ground and bridging knowledge systems across space and time. Moreover, the meta-vision (in the form of a printed painting and individual postcards) also proved beneficial to engage the general public in these events by allowing the audience to interact (e.g., empathize, weigh elements of the vision) with its constitutive elements and narrative, thus allowing to gain new feedback, spark curiosity, or prompt new conversations (Fig. 5).

The impacts of the co-creation process

The impact assessment of the co-creation process showed that project participants benefited from the experience and made use of novel information for confirmational, educational, instrumental, projective, and motivational purposes (Fig. 6). Immediately after the visioning exercise, participants expressed they were highly motivated and positively surprised and inspired

Fig. 5. The instrumental role of the meta-vision in continuing the transformative space and engaging broader audiences. Photos were taken during the launching events of the short-film “Pescando Transformaciones” (13 and 30 November 2022, Uruguay).



by the novel arts-based visioning method, as stated by a participant: “I am very happy and grateful for the way in which by playing we can achieve something for the sake of all fishing communities. Playing! That’s a beautiful thing to share ... I’m going to try to implement the method myself in schools ... I am very interested in the method.” Participants noted that they enjoyed the exercise while being able to discuss important matters, and they also highly valued the opportunity to get to know other initiatives and make new links with other actors in the food system. For instance, another participant expressed:

Knowing about fishing in other places, such as the COOPESCONAND initiative... It is not something that we all have very much in mind: inland fishing ... To see how they work, to know how they work. Notice that it is one of the oddest initiatives for us or the one that is farthest from us, and yet they are the ones that are the most advanced in artisanal fishing in terms of fish handling, permits, and organizational capacities.

During the online follow-up workshop, participants also identified positive impacts along the entire gradient, with confirmatory, instrumental, and motivational impacts being particularly frequent (Fig. 6). For instance, the co-created vision elicited confirmational and instrumental purposes, as explained by a participant:

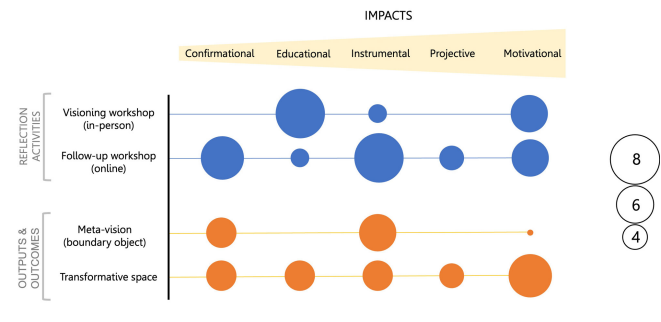
I agree with what she [the artist] raised in those images [the meta-vision]. I think she was able to capture what the workshop was like, the different opinions and points of view that were expressed. I think it is useful, because seeing that captured, in a drawing and in a synthesis [the meta-vision], allows you to plan from there, the actions. Starting from a concrete basis that you are looking at.

Another participant explained that the embodiment of desirable visions strengthened his own agency through means of confirmation, as stated in the following quote: “This [the meta-vision] gave me confidence and made me more certain that what we are doing, we are doing it very well.”

Several participants mentioned impacts related to initiating the transformative space, with motivational impacts being particularly frequent. For instance, one participant stated: “I believe that this space we have generated, including all the initiatives, is a shelter that small-scale fisheries need.” Moreover, motivational impacts are linked with instrumental ones, as acknowledged by another participant: “It keeps me very motivated because ... it is a way to reach many more people and to visualize everything we are doing [in reference to the transformative space], each one from their own place.” Furthermore, the transformative space allowed participants to better understand possible futures (i.e., projective impacts): “Personally, it changed my perception of the future of small-scale fisheries. Because it is good to see so many people interested in the future of small-scale fisheries.”

Last, the potential usefulness of the meta-vision as a boundary object was evident when considering the perceptions of those who were not directly involved in co-creating the meta-vision. As stated by one of the online workshop participants: “Even though I wasn’t there [in the visioning workshop], I feel like I was there anyway ... I adhere to that [the meta-vision] and it is as if I had been there.” Moreover, the meta-vision is flexible enough to adapt

Fig. 6. Impacts from the co-production process according to the reflection activities (visioning workshop vs. follow-up workshop) and outputs/outcomes (meta-vision vs. the transformative space). The indicator-impact gradient was adapted from Wall et al. (2017). The size of the circles indicates the number of participants that expressed a specific type of impact.



to specific contexts (e.g., villages, fishing communities) despite not being necessarily represented or considered during the visioning exercise: “I feel the illustration [the meta-vision] captures the essence of La Paloma [her own town], what it is like to live here. But not only of La Paloma but also of Valizas [a nearby town], as it is very linked to the local culture.”

DISCUSSION

Our paper summarizes a process of collectively initiating a transformative space, prompted by envisioning desired futures and empowering emerging innovative sustainability initiatives of small-scale fisheries in Uruguay. Through a novel arts-based method, different knowledge systems, scientific, local, experience-based, and practical, were engaged in a creative exercise. Thus, our results serve as inspiration and a starting point for plural discourses and narrative coalitions (Wittmayer et al. 2019, Riedy 2020) about sustainable and thriving small-scale fisheries in Uruguay. Moreover, the co-creation process encouraged academic and non-academic participants to plan collective actions and to feel more confident, motivated, and optimistic. Altogether, our results showed that the process was successful in providing a meaningful boundary object for multiple and diverse actors of the small-scale fisheries food system, laying the foundations of a transformative space for collective reflection and learning, and reframing problems and solutions creatively.

Co-created visions and their usefulness as a boundary object

The co-creation process enabled multiple voices and perspectives to co-exist in a single artistic boundary object while stemming from different angles and knowledge systems (Star and Griesemer 1989, Brockelman 2001). Thus, the meta-vision constitutes a key and concrete tool for many to counter dominant bleak narratives about small-scale fisheries. Moreover, as a vision of desirable futures, it is system-oriented, coherent, tangible, relevant, nuanced, plausible, motivational, and shared, characteristics that were suggested as critical for stimulating changes toward sustainability transformations (van der Helm 2009, Wiek and Iwaniec 2014). It has proven to be confirmational and instrumental among multiple and diverse participants, resonating with them even if they did not agree with all elements (i.e., consent

rather than consensus). Moreover, the fact that other project members who did not participate in the visioning exercise acknowledged confirmational, instrumental, and motivational impacts denotes both the usefulness of the co-created artistic boundary object and its engagement potential for the ongoing process.

The resulting meta-vision helps to create a new discourse, while also communicating core values, generating a strong sense of group belonging, and enrolling new actors (Wittmayer et al. 2019). Therefore, the potential impact of this artistic boundary object not only enables the continuation of this coalition for action (i.e., the transformative space), but also the generation of new relations that can eventually generate more political power to challenge the dominant discourses that resist deep transformations. Consequently, the co-created boundary object should not be seen as static, but adaptable as new actors get involved or participants' priorities change over time (Rathwell et al. 2015). Taken together, our results support the notion that boundary objects, especially those resulting from collaboratively arts-based practices, are instrumental not only as a translation device between worlds, but as a dynamic resource that helps to shape and communicate social identities within and across groups (Gal et al. 2004, Rathwell and Armitage 2016).

The promise of arts-based methods for democratic, creative and meaningful collaborations

The collage visioning exercise allowed participants to practice their own creativities (Sanders and Stappers 2008), offered an alternative language (or medium) through which to express and foster trust, and provided a way to tap into their experience-based knowledge and memories. The collage process enabled participants to get to know each other; reflect, articulate, and communicate their thoughts, feelings, values, and imaginations; negotiate differences and find new connections among ideas or elements (Norris 2008). Fish workers, as well as other small-scale producers, often find it difficult to envision ideal futures disconnected from existing problems and current circumstances (Saunders et al. 2016). However, the visioning method allowed diverse participants to transcend a creative paralysis based on the challenge of envisioning the future (Mazé 2019), while reconsidering contextual elements from their pasts and territories to craft meaningful future visions. Importantly, this specific arts-based method helped to move beyond technologically determined futures (e.g., Merrie et al. 2018, Lübker et al. 2023), a frequent bias in Western contexts (Cork et al. 2023). Thus, collage is gaining traction as part of the future-thinking toolkit to stimulate creativity and flesh out meaningful, down-to-earth narratives in diverse contexts (e.g., Sellberg et al. 2020), including when establishing transdisciplinary collaborations with Indigenous peoples and local communities (Falardeau et al. 2019).

Collage, like similar creative methods, allows often silenced voices to take precedence (Mangnus et al. 2019, Rathwell and Armitage 2016). For example, during the visioning workshop, different participants shared, interpreted, and described their collages in their own terms. Moreover, participants enjoyed the activity and felt the playful nature of the method was a plus. Importantly, both the visioning workshop as a whole and the arts-based method helped participants to feel closer and generate a sort of shared identity and co-ownership of the co-created visions (i.e., "being part of a project that may design the future": van der Helm 2009:102) and the transformative space itself (Galafassi et al. 2018, Pereira et al. 2020).

The design of the visioning exercise (and the overall visioning workshop where it was embedded), as well as the facilitation of the activities and the synthesis of the outputs (with strong inputs from the designers and artists involved), played a central role in democratizing creativity, nurturing the transformative space and a new narrative of change (Wittmayer et al. 2019, Juri et al. 2022). Imaginative visions are part of a longer process continuing to mobilize social and political action (Davies 2014), so the enhancement of agency is only one part (Moore and Milkoreit 2020). The arts-based approach here applied to small-scale fisheries, but applicable elsewhere to any social-ecological system, can also foster an emotional predisposition for enabling and navigating sustainability transformations (Heras and Tàbara 2014, Galafassi et al. 2018), which demand new ways of knowing, doing, and also being (Fazey et al. 2020, Escobar 2020).

Finally, our combination of an arts-based method and a food system approach harnessed the creativity of multiple and diverse actors within the small-scale fisheries food system. The arts-based method provided a common ground and language to spark a highly engaging transdisciplinary collaboration that fed the narrative that small-scale fisheries are highly valuable and will persist in their contribution to food systems (Short et al. 2021, Blue Food Assessment 2021). Moreover, it exemplified the elements that constitute desirable futures for small-scale fisheries and the diversity and interconnectedness of actors that may shape, and benefit from, such futures.

Caveats of co-created visions

The Collaging Futures method used plural pasts to nurture desirable futures, a methodological constraint that may have biased the resulting visions in being neither entirely disruptive nor visionary for the temporal horizon settled (Wiek and Iwaniec 2014). For instance, the collages and the meta-vision do not include explicit post-capitalism elements that hint at an organizational system fundamentally different, but instead, portray an enhanced version of the current one. To introduce innovative, disruptive, or radical elements, ocean futuring approaches have combined storyboards, science fiction prototyping, arts-based and structured futuring methods (e.g., Merrie et al. 2018, Lübker et al. 2023, Pereira et al. 2023). However, we argue that using elements of the past to inform the future was instrumental for the vision to be meaningful and relatable to most participants, and to leverage existent local and ecological knowledge and values. Otherwise, the primary function of the meta-vision as an artistic boundary object (i.e., connecting social worlds) would be compromised and only relatable to those with a more disruptive mindset.

For a system-level transformation to occur, embracing institutional power and political dimensions is critical. However, this process has so far focused on creative and arts-based methods to reframe participants' perception of agency and empower marginalized actors, two goals prone to fail when powerful actors such as government officials are included from the onset (Chambers et al. 2021). The intent of this paper is therefore not to explore the social performativity of the imagined visions, although this can be an important aspect to consider within the broader socio-political sphere (Oomen et al. 2022), but rather to examine how the process of co-creating visions within a transformative space led to specific actions and connections

within the convened group, as described above. A follow-up process could be to situate the imagined future within the social processes and practices that allow imagined futures to become socially performative, which would incorporate other powerful and political actors. Indeed, such a process may harness the potential conflicts and tensions arising from broadening the transformative space (e.g., marked power asymmetries between participants, co-occurrence of contested agendas) and thus avoiding echo chambers, i.e., spaces where opinions or beliefs are not questioned, and embracing the political process and power dynamics that inherently underpin any transformation (Blythe et al. 2018, Chambers et al. 2022).

CONCLUSION

In this paper we provide an empirical country-level case study that depicts and discusses the challenges and opportunities of deliberately, creatively, and collectively building the stepping stones for a sustainability transformation in small-scale fisheries. Leveraging the agency of a coalition of sustainability initiatives led by food system actors, a co-production process was facilitated by researchers and enabled by artists and designers whose artistic approaches and design methods were instrumental in sparking collective creativity and building a shared identity. Thus, multiple and diverse participants became active agents of change who co-created meaningful context-based visions of desirable futures. The co-creation of a meta-vision through arts-based methods proved instrumental to engage disparate actors over time (independently if they participated in the visioning exercise or not), and enabled a transformative space aimed at shaping new and inspiring narratives about small-scale fisheries food systems in Uruguay. The usefulness of the meta-vision for instrumental, projective, and motivational purposes shows its potential as a key artistic boundary object within and beyond the transformative space initiated.

The results of the visioning exercise represent a milestone within a broader ongoing effort aimed at enabling sustainability transformations of small-scale fisheries in Uruguay. Yet, several key challenges remain as the process unfolds. For instance, moving beyond echo chambers and leveraging tensions arising from broadening the transformative space will be crucial to embrace the politics that underpin any transformation portrayed as desirable. Contending the normative and subjective dimensions of visions of desirable futures will ultimately determine the plausibility of envisioned futures and the transformative potential of transdisciplinary spaces for collaboration and experimentation.

In times when the question “Are we witnessing the last generation of small-scale fishers?” resonates in many places, this paper offers an illustrative and compelling example of how co-producing plural and optimistic futures may contribute to disrupt bleak narratives of small-scale fisheries futures. In addition, by engaging multiple actors in a space and creating a roadmap toward transformative futures, the nascent narrative generates momentum and the commitment needed to highlight the multi-dimensional contributions and the key role that small-scale fisheries have, and will, play in local and global food systems.

Acknowledgments:

This work formed part of IG's Ph.D. at Campus Do Mar (Doctoral Program “Marine Science, Technology and Management”) in the Universidade de Santiago de Compostela. IG acknowledges the financial support provided by CRETUS (Centre for Cross-disciplinary Research in Environmental Technologies). IG and SV acknowledge the support of the EQUALSEA (Transformative adaptation towards ocean equity) project, under the European Horizon 2020 Program, ERC Consolidator Grant Agreement no 101002784 funded by the European Research Council. IG, SJ, MT, and SV acknowledge the financial support provided by Future Earth Pathways Initiative. Special thanks to Antonio Garcia-Allut, Jorge Marcone, Sofia Rosa, Marisol Ortega-Pallanez, Blanca Miedes, Julio Juri, Victor Burgos, Matias Porley, Manuel Rey, and SARAS staff for valuable input and assistance during the project. We thank two anonymous reviewers and the Subject Editor for their thoughtful and constructive comments and suggestions.

Data Availability:

Ethical approval for this research study was granted by the Bioethics Committee of the Universidade de Santiago de Compostela (Code: USC 23/2022).

LITERATURE CITED

- Arthur, R. I., D. J. Skerritt, A. Schuhbauer, N. Ebrahim, R. M. Friend, and U. R. Sumaila. 2022. Small-scale fisheries and local food systems: transformations, threats and opportunities. *Fish and Fisheries* 23(1):109-124. <https://doi.org/10.1111/faf.12602>
- Astori, D., and M. Buxedas. 1986. La pesca en el Uruguay: balance y perspectivas. CIEDUR, Montevideo, Uruguay.
- Béné, C., M. Barange, R. Subasinghe, P. Pinstrup-Andersen, G. Merino, G. I. Hemre, and M. Williams. 2015. Feeding 9 billion by 2050 - putting fish back on the menu. *Food Security* 7:261-274. <https://doi.org/10.1007/s12571-015-0427-z>
- Bennett, N. J., T. S. Whitty, E. Finkbeiner, J. Pittman, H. Bassett, S. Gelcich, and E. H. Allison. 2018. Environmental stewardship: a conceptual review and analytical framework. *Environmental Management* 61:597-614. <https://doi.org/10.1007/s00267-017-0993-2>
- Bértola L., L. Bermudez, and M. Camou. 1996. Pesca: Sinsabores y Esperanzas: Síntesis de las Acciones del CCU en el Área de la Pesca Artesanal en los últimos 25 años. Ediciones del Centro Cooperativista Uruguayo, Montevideo, Uruguay.
- Blue Food Assessment. 2021. Building blue food futures for people and the planet. The Report of the Blue Food Assessment, Stockholm Resilience Centre, the Center for Ocean Solutions and Center on Food Security and the Environment at Stanford University and EAT.
- Blythe, J., J. Silver, L. Evans, D. Armitage, N. J. Bennett, M.-L. Moore, T. H. Morrison, and K. Brown. 2018. The dark side of transformation: latent risks in contemporary sustainability discourse. *Antipode* 50:1206-1223. <https://doi.org/10.1111/anti.12405>

- Bove, M. I., and F. Cerruti. 2008. Los alimentos y las bebidas en los hogares: ¿un factor de protección o de riesgo para la salud y el bienestar de los uruguayos? Encuesta nacional de gastos e ingresos de los hogares 2005-2006. Instituto Nacional de Estadística, Montevideo, Uruguay.
- Brockelman, T. P. 2001. *The frame and the mirror: on collage and the postmodern*. Northwestern University Press, Evanston, Illinois, USA.
- Bui, S., A. Cardona, C. Lamine, and M. Cerf. 2016. Sustainability transitions: insights on processes of niche-regime interaction and regime reconfiguration in agri-food systems. *Journal of Rural Studies* 48:92-103. <https://doi.org/10.1016/j.jrurstud.2016.10.003>
- Calderón-Contreras, R., P. Balvanera, M. Trimble, A. Langle-Flores, E. Jobbágy, M. Maass Moreno, J. Marcone, N. Mazzeo, M. M. Muñoz Anaya, I. A. Ortíz-Rodríguez, M. Perevotchikova, S. Avila-Foucat, M. Bonillo-Moheno, L. B. Clark, M. Equihua, B. Ayala-Orozco, I. Bueno, L. Hensler, J. C. Leyva Aguilera, M. M. Ramos, J. Merçon, M. A. Mesa-Jurado, H. Österblom, R. Pacheco-Vega, B. Pérez Alcántara, O. Pérez-Maqueo, L. Porter-Bolland, S. Quijas, L. E. Quiroz Rosas, E. Rios Patron, J. C. Rocha-Gordo, I. A. Rojo Negrete, L. P. Romero-Duque, J. A. Rosell, M. Scheffer, L.-B. Vázquez, M. Villada Canela, and M. Velázquez. 2022. A regional PECS node built from place-based social-ecological sustainability research in Latin America and the Caribbean. *Ecosystems and People* 18:1-14. <https://doi.org/10.1080/26395916.2021.2000501>
- Chambers, J. M., C. Wyborn, N. L. Klenk, M. Ryan, A. Serban, N. J. Bennett, R. Brennan, L. Charli-Joseph, M. E. Fernández-Giménez, K. A. Galvin, B. E. Goldstein, T. Haller, R. Hill, C. Munera, J. L. Nel, H. Österblom, R. S. Reid, M. Riechers, M. Spierenburg, M. Tengö, E. M. Bennett, A. Brandeis, P. Chatterton, J. J. Cockburn, C. Cvitanovic, P. Dumrongrojwathana, A. Paz Durán, J.-D. Gerber, J. M. H. Green, R. Gruby, A. M. Guerrero, A. -I. Horcea-Milcu, J. Montana, P. Steyaert, J. G. Zaehring, A. T. Bednarek, K. Curran, S. J. Fada, J. Hutton, B. Leimona, T. Pickering, and R. Rondeau. 2022. Co-productive agility and four collaborative pathways to sustainability transformations. *Global Environmental Change* 72:102422. <https://doi.org/10.1016/j.gloenvcha.2021.102422>
- Chambers, J. M., C. Wyborn, M. E. Ryan, R. S. Reid, M. Riechers, A. Serban, N. J. Bennett, C. Cvitanovic, M. E. Fernández-Giménez, K. A. Galvin, B. E. Goldstein, N. L. Klenk, M. Tengö, R. Brennan, J. J. Cockburn, R. Hill, C. Munera, J. L. Nel, H. Österblom, A. T. Bednarek, E. M. Bennett, A. Brandeis, L. Charli-Joseph, P. Chatterton, K. Curran, P. Dumrongrojwathana, A. Paz Durán, S. J. Fada, J. -D. Gerber, J. M. H. Green, A. M. Guerrero, T. Haller, A.-I. Horcea-Milcu, B. Leimona, J. Montana, R. Rondeau, M. Spierenburg, P. Steyaert, J. G. Zaehring, R. Gruby, J. Hutton, and T. Pickering. 2021. Six modes of co-production for sustainability. *Nature Sustainability* 4:983-996. <https://doi.org/10.1038/s41893-021-00755-x>
- Cohen, P. J., E. H. Allison, N. L. Andrew, J. Cinner, L. S. Evans, M. Fabinyi, L. R. Garces, S. J. Hall, C. C. Hicks, T. P. Hughes, S. Jentoft, D. J. Mills, R. Masu, E. K. Mbaru, and B. D. Ratner. 2019. Securing a just space for small-scale fisheries in the blue economy. *Frontiers in Marine Science* 6:171. <https://doi.org/10.3389/fmars.2019.00171>
- Cork, S., C. Alexandra, J. G. Alvarez-Romero, E. M. Bennett, M. Berbés-Blázquez, E. Bohensky, B. Bok, R. Costanza, S. Hashimoto, R. Hill, S. Inayatullah, K. Kok, J. J. Kuiper, M. Moglia, L. Pereira, G. Peterson, R. Weeks, and C. Wyborn. 2023. Exploring alternative futures in the Anthropocene. *Annual Review of Environment and Resources* 48:25-54. <https://doi.org/10.1146/annurev-environ-112321-095011>
- Davies, A. R. 2014. Co-creating sustainable eating futures: technology, ICT and citizen-consumer ambivalence. *Futures* 62:181-193. <https://doi.org/10.1016/j.futures.2014.04.006>
- de la Cadena, M., and M. Blaser. 2018. *A world of many worlds*. Duke University Press, Durham, North Carolina, USA. <https://doi.org/10.1515/9781478004318>
- Deleuze, G., and F. Guattari. 2005. *A thousand plateaus: capitalism and schizophrenia*. University of Minnesota Press, Minneapolis, Minnesota, USA.
- Delgado, F. B., and S. Rist. 2016. Ciencias, diálogo de saberes y transdisciplinariedad: aportes teórico metodológicos para la sustentabilidad alimentaria y del desarrollo. UMSS Universidad Mayor de San Simón, FCAPyF Facultad de Ciencias Agrícolas Pecuarias y Forestales, AGRUCO Agroecología Universidad de Cochabamba; Plural Editores, Cochabamba: La Paz, Bolivia.
- Dreborg, K. H. 1996. Essence of backcasting. *Futures* 28:813-828. [https://doi.org/10.1016/S0016-3287\(96\)00044-4](https://doi.org/10.1016/S0016-3287(96)00044-4)
- Ericksen, P. J. 2008. Conceptualizing food systems for global environmental change research. *Global Environmental Change* 18(1):234-245. <https://doi.org/10.1016/j.gloenvcha.2007.09.002>
- Escobar, A. 2020. *Pluriversal politics*. Duke University Press, Durham, North Carolina, USA.
- Etchebehere, C., and J. Geymonat. 2018. La pesca artesanal y su inserción en el desarrollo del complejo pesquero. Pages 183-200 in C. Etchebehere, O. Galli, J. Geymonat, M. Mendy, S. Morales, and W. Norbis, editors. *Análisis del complejo pesquero uruguayo: una experiencia de investigación y extensión con los trabajadores del mar*. Colección Cassina. Extensión Libros Editora, CSEAM, Montevideo, Uruguay.
- Evans, J., R. Flore, J. Astrup Pedersen, and M. Bom Frøst. 2015. Place-based taste: geography as a starting point for deliciousness. *Flavour* 4(1):7. <https://doi.org/10.1186/2044-7248-4-7>
- Falardeau, M., C. Raudsepp-Hearne, and E. M. Bennett. 2019. A novel approach for co-producing positive scenarios that explore agency: case study from the Canadian Arctic. *Sustainability Science* 14:205-220. <https://doi.org/10.1007/s11625-018-0620-z>
- Fazey, I., N. Schöpke, G. Caniglia, A. Hodgson, I. Kendrick, C. Lyon, G. Page, J. Patterson, C. Riedy, T. Strasser, S. Verveen, D. Adams, B. Goldstein, M. Klaes, G. Leicester, A. Linyard, A. McCurdy, P. Ryan, B. Sharpe, G. Silvestri, A. Y. Abdurrahim, D. Abson, O. S. Adetunji, P. Aldunce, C. Alvarez-Pereira, J. M. Amparo, H. Amundsen, L. Anderson, L. Andersson, M. Asquith, K. Augenstein, J. Barrie, D. Bent, J. Bentz, A. Bergsten, C. Berzonsky, O. Bina, K. Blackstock, J. Boehnert, H. Bradbury, C. Brand, J. Böhme (born Sangmeister), M. M. Bøjer, E. Carmen, L. Charli-Joseph, S. Choudhury, S. Chunchoti-ananta, J. Cockburn, J. Colvin, I. L. C. Connon, R. Cornforth, R. S. Cox, N. Cradock-Henry, L. Cramer, A. Cremaschi, H. Dannevig, C.

- T. Day, C. de Lima Hutchison, A. de Vrieze, V. Desai, J. Dolley, D. Duckett, R. A. Durrant, M. Egermann, E. Elsner (Adams), C. Fremantle, J. Fullwood-Thomas, D. Galafassi, J. Gobby, A. Golland, S. K. González-Padrón, I. Gram-Hanssen, J. Grandin, S. Grenni, J. Lauren Gunnell, F. Gusmao, M. Hamann, B. Harding, G. Harper, M. Hesselgren, D. Hestad, C. A. Heykoop, J. Holmén, K. Holstead, C. Hoolohan, A.-I. Horcea-Milcu, L. G. Horlings, S. M. Howden, R. A. Howell, S. I. Huque, M. L. Inturias Canedo, C. Y. Iro, C. D. Ives, B. John, R. Joshi, S. Juarez-Bourke, D. W. Juma, B. C. Karlson, L. Kliem, A. Kläy, P. Kuenkel, I. Kunze, D. P. M. Lam, D. J. Lang, A. Larkin, A. Light, C. Luederitz, T. Luthe, C. Maguire, A.-M. Mahecha-Groot, J. Malcolm, F. Marshall, Y. Maru, C. McLachlan, P. Mmbando, S. Mohapatra, M.-L. Moore, A. Moriggi, M. Morley-Fletcher, S. Moser, K. M. Mueller, M. Mukute, S. Mühlemeier, L. O. Naess, M. Nieto-Romero, P. Novo, K. O'Brien, D. A. O'Connell, K. O'Donnell, P. Olsson, K. R. Pearson, L. Pereira, P. Petridis, D. Peukert, N. Phear, S. R. Pisters, M. Polsky, D. Pound, R. Preiser, Md. S. Rahman, M. S. Reed, P. Revell, I. Rodriguez, B. C. Rogers, J. Rohr, M. Nordbø Rosenberg, H. Ross, S. Russell, M. Ryan, P. Saha, K. Schleicher, F. Schneider, M. Scoville-Simonds, B. Searle, S. P. Sebhatu, E. Sesana, H. Silverman, C. Singh, E. Sterling, S.-J. Stewart, J. D. Tàbara, D. Taylor, P. Thornton, T. M. Tribaldos, P. Tschakert, N. Uribe-Calvo, S. Waddell, S. Waddock, L. van der Merwe, B. van Mierlo, P. van Zwanenberg, S. J. Velarde, C.-L. Washbourne, K. Waylen, A. Weiser, I. Wight, S. Williams, M. Woods, R. Wolstenholme, N. Wright, S. Wunder, A. Wyllie, and H. R. Young. 2020. Transforming knowledge systems for life on Earth: visions of future systems and how to get there. *Energy Research & Social Science* 70:101724. <https://doi.org/10.1016/j.erss.2020.101724>
- Food and Agriculture Organization (FAO). 1997. FAOSTAT statistical database. FAO, Rome, Italy. <https://www.fao.org/faostat/en/#home>
- Food and Agriculture Organization (FAO). 2015. Voluntary guidelines for securing sustainable small-scale fisheries in the context of food security and poverty eradication. FAO, Rome, Italy. <http://www.fao.org/3/i4356en/i4356en.pdf>
- Food and Agriculture Organization (FAO), Duke University, and WorldFish. 2023. Illuminating hidden harvests - the contributions of small-scale fisheries to sustainable development. FAO, Rome, Italy; Duke University Press, Durham, North Carolina, USA; WorldFish, Penang, Malaysia.
- Fry, T., and M. Tlostanova. 2020. A new political imagination: making the case. Routledge, London, UK. <https://doi.org/10.4324/9781003038221>
- Funge-Smith, S., X. Basurto, N. L. Gutierrez, and H. Snyder. 2023. The challenge of defining small-scale fisheries: determining scale of operation by identifying general fisheries characteristics. Pages 17-28 in FAO, Duke University, and WorldFish. Illuminating hidden harvests: the contributions of small-scale fisheries to sustainable development. FAO, Rome, Italy; Duke University Press, Durham, North Carolina, USA; WorldFish, Penang, Malaysia.
- Gal, U., Y. Yoo, and R. J. Boland. 2004. The dynamics of boundary objects, social infrastructures and social identities. *Sprouts: Working Papers on Information Systems* 4(4):193-206.
- Galafassi, D., S. Kagan, M. Milkoreit, M. Heras, C. Bilodeau, S. J. Bourke, A. Merrie, L. Guerrero, G. Pétursdóttir, and J. D. Tàbara. 2018. 'Raising the temperature': the arts on a warming planet. *Current Opinion in Environmental Sustainability* 31:71-79. <https://doi.org/10.1016/j.cosust.2017.12.010>
- Gaziulusoy, A. İ., and C. Ryan. 2017. Roles of design in sustainability transitions projects: a case study of Visions and Pathways 2040 project from Australia. *Journal of Cleaner Production* 162:1297-1307. <https://doi.org/10.1016/j.jclepro.2017.06.122>
- Gianelli, I., and O. Defeo. 2017. Uruguayan fisheries under an increasingly globalized scenario: long-term landings and bioeconomic trends. *Fisheries Research* 190:53-60. <https://doi.org/10.1016/j.fishres.2017.02.002>
- Gianelli, I., S. Horta, G. Martínez, A. de la Rosa, and O. Defeo. 2018. Operationalizing an ecosystem approach to small-scale fisheries in developing countries: the case of Uruguay. *Marine Policy* 95:180-188. <https://doi.org/10.1016/j.marpol.2018.03.020>
- Gianelli, I., M. Trimble, S. Rosa, N. Beretta, A. C. Dias, and S. Villasante. 2021. Catálogo Transformador de la Pesca Artesanal. Ciclo: "Saberes sobre la mesa. Hacia sistemas y prácticas alimentarias sostenibles". Instituto Sudamericano para Estudios sobre Resiliencia y Sostenibilidad (SARAS), Maldonado, Uruguay.
- Gianelli, I., M. Trimble, S. Rosa, N. Beretta, A. C. Dias, and S. Villasante. 2022. Entretejiendo el futuro: semillas de cambio en la pesca artesanal de Uruguay. *Tekoporá. Revista Latinoamericana de Humanidades Ambientales y Estudios Territoriales* 4:121-149.
- Hamilton, J., X. Basurto, H. Smith, and J. Viridin. 2021. How does the World Bank shape global environmental governance agendas for coasts? 50 years of small-scale fisheries aid reveals paradigm shifts over time. *Global Environmental Change* 68:102246. <https://doi.org/10.1016/j.gloenvcha.2021.102246>
- Harper, S., D. Kleiber, S. Appiah, M. Atkins, K. Bradford, A. Choudhury, P. J. Cohen, S. de la Puente, M. de la Torre Castro, A. Duffy-Tumasz, K. Fakoya, A. Fent, S. Fröcklin, N. Gopal, C. Gough, M. Gustavsson, H. M. Hapke, L. Hellebrandt, A. J. Ferrer, J. L. Johnson, K. Kusakabe, S. Lawless, G. Macho, S. Mangubhai, C. Manyungwa-Pasani, C. McDougall, E. Ojea, A. Oloko, C. Pedroza, T. Randrianjafimanana, R. Rasoloniriana, L. Robson, C. Romeo, D. Salgueiro-Otero, H. Snyder, and K. Soejima. 2023. Towards gender inclusivity and equality in small-scale fisheries. Pages 127-144 in FAO, Duke University, and WorldFish. Illuminating hidden harvests: the contributions of small-scale fisheries to sustainable development. FAO, Rome, Italy; Duke University Press, Durham, North Carolina, USA; WorldFish, Penang, Malaysia.
- Heras, M., and J. D. Tàbara. 2014. Let's play transformations! Performative methods for sustainability. *Sustainability Science* 9:379-398. <https://doi.org/10.1007/s11625-014-0245-9>
- Hoff, E. V. 2020. Imagination. Pages 617-623 in S. Pritzker and M. Runco, editors. *Encyclopedia of creativity*. Third edition. Academic, Oxford, UK. <https://doi.org/10.1016/B978-0-12-809324-5.21897-X>

- Horta, S., and O. Defeo. 2012. The spatial dynamics of the whitemouth croaker artisanal fishery in Uruguay and interdependencies with the industrial fleet. *Fisheries Research* 125-126:121-128. <https://doi.org/10.1016/j.fishres.2012.02.007>
- Hyysalo, S., T. Marttila, S. Perikangas, and K. Auvinen. 2019. Codesign for transitions governance: a mid-range pathway creation toolset for accelerating sociotechnical change. *Design Studies* 63:181-203. <https://doi.org/10.1016/j.destud.2019.05.002>
- Instituto Nacional de Carnes (INAC). 2020. Consumo de carnes en Uruguay. Informe 2020. Instituto Nacional de Carnes, Montevideo, Uruguay.
- Irwin, T. 2018. The emerging transition design approach. In C. Storni, K. Leahy, M. McMahon, P. Lloyd, and E. Bohemia, editors. *Design as a catalyst for change - DRS International Conference 2018*, 25-28 June, Limerick, Ireland. <https://doi.org/10.21606/drs.2018.210>
- Johnson, D. S. 2006. Category, narrative, and value in the governance of small-scale fisheries. *Marine Policy* 30(6):747-756. <https://doi.org/10.1016/j.marpol.2006.01.002>
- Juri, S., M. Baraibar, L. B. Clark, M. Cheguhem, E. Jobbagy, J. Marcone, N. Mazzeo, M. Meerhoff, M. Trimble, C. Zurbriggen, and L. Deutsch. 2022. Food systems transformations in South America: insights from a transdisciplinary process rooted in Uruguay. *Frontiers in Sustainable Food Systems* 6:2022. <https://doi.org/10.3389/fsufs.2022.887034>
- Juri, S., C. Zurbriggen, S. Bosch Gómez, and M. Ortega Pallanez. 2021. Transition design in Latin America: enabling collective learning and change. *Frontiers in Sociology* 6:202. <https://doi.org/10.3389/fsoc.2021.725053>
- Kossoff, G., and T. Irwin. 2021. Transition design as a strategy for addressing urban wicked problems. Chapter 5 in H. Sadri, S. Zeybekoglu, editors. *Cities without capitalism*. Routledge, London, UK. <https://doi.org/10.4324/9780429352485-6>
- Laborde, G. 2022. Los sabores de la Nación - Cocina e identidad en la historia de Uruguay. Ediciones de la Banda Oriental. Montevideo, Uruguay.
- Lagos, X., C. Laporta, C. Alvarez, M. Baptista, and I. Fernández. 2019. Asociatividad y fortalecimiento comunitario desde el Manejo Costero Integrado: la experiencia de mujeres pescadoras en el área protegida de Laguna de Rocha (Rocha, Uruguay). *Costas* 1:111-134.
- Lam, D. P., B. Martín-López, A. Wiek, E. M. Bennett, N. Frantzeskaki, A. I. Horcea-Milcu, and D. J. Lang. 2020. Scaling the impact of sustainability initiatives: a typology of amplification processes. *Urban Transformations* 2:3. <https://doi.org/10.1186/s42854-020-00007-9>
- Langley, J., D. Wolstenholme, and J. Cooke. 2018. 'Collective making' as knowledge mobilisation: the contribution of participatory design in the co-creation of knowledge in healthcare. *BMC Health Services Research* 18:585. <https://doi.org/10.1186/s12913-018-3397-y>
- Leavy, P. 2020. *Method meets art: arts-based research practice*. Third edition. Guilford, New York, New York, USA.
- Loorbach, D. A. 2022. Designing radical transitions: a plea for a new governance culture to empower deep transformative change. *City, Territory and Architecture* 9(1):30. <https://doi.org/10.1186/s40410-022-00176-z>
- Lübker, H. M., P. W. Keys, A. Merrie, L. M. Pereira, J. C. Rocha, and G. Ortuño Crespo. 2023. Imagining sustainable futures for the high seas by combining the power of computation and narrative. *npj Ocean Sustainability* 2(1):4. <https://doi.org/10.1038/s44183-023-00012-y>
- Machín, L., J. Aschemann-Witzel, A. Patiño, X. Moratorio, E. Bandeira, M. R. Curutchet, J. Martínez, I. Bove, V. Molina, A. Giménez, and G. Ares. 2018. Barriers and facilitators to implementing the Uruguayan dietary guidelines in everyday life: a citizen perspective. *Health Education & Behavior* 45:511-523. <https://doi.org/10.1177/1090198117744243>
- Malmborg, K., E. Enfors-Kautsky, L. Schultz, and A. V. Norström. 2022. Embracing complexity in landscape management: learning and impacts of a participatory resilience assessment. *Ecosystems and People* 18:241-257. <https://doi.org/10.1080/26395916.2022.2061596>
- Mangnus, A. C., J. M. Vervoort, S. R. McGreevy, K. Ota, C. D. D. Rupperecht, M. Oga, and M. Kobayashi. 2019. New pathways for governing food system transformations: a pluralistic practice-based futures approach using visioning, back-casting, and serious gaming. *Ecology and Society* 24(4):2. <https://doi.org/10.5751/ES-11014-240402>
- Mazé, R. 2019. Politics of designing visions of the future. *Journal of Futures Studies* 23:23-38.
- Merrie, A., P. Keys, M. Metian, and H. Österblom. 2018. Radical ocean futures-scenario development using science fiction prototyping. *Futures* 95:22-32. <https://doi.org/10.1016/j.futures.2017.09.005>
- Mills, D. J., F. Simmance, K. Byrd, M. Ahern, P. Cohen, E. D'Agostino, K. Fiorella, E. Garrido-Gamarro, E. Gondwe, C. Hicks, E. Kaunda, M. Kjellevoid, J. Kolding, A. Levsen, A. K. Lundebye, P. Marinda, A. McNeil, J. Nagoli, B. Nankwenya, G. Nico, L. O'Meara, L. Pincus, J. Pucher, J. Robinson, M. Roscher, M. Sanden, T. K. Seow, C. Svanevik, S. J. Teoh, S. Thilsted, A. Tilley, and M. A. Tuazon. 2023. Contributions of small-scale fisheries to food security and nutrition. Pages 145-174 in *FAO, Duke University, and WorldFish. Illuminating hidden harvests: the contributions of small-scale fisheries to sustainable development*. FAO, Rome, Italy; Duke University Press, Durham, North Carolina, USA; WorldFish, Penang, Malaysia.
- Ministerio de Salud Pública (MSP). 2019. *Guía alimentaria para la población uruguaya. Para una alimentación saludable, compartida y placentera*. Ministerio de Salud Pública, Montevideo, Uruguay.
- Moguel, P. 2015. Los Náhuats y El Kuojtakiloyan: Ejemplo Vivo De Resiliencia Comunitaria. Pages 15-33 in V. M. Toledo, editor. *El Kuojtakiloyan: patrimonio biocultural Nahuatl de la Sierra Norte de Puebla, México*. CONACyT, Red de Patrimonio Biocultural, Universidad Nacional Autónoma de México, México.

- Moore, M.-L., and M. Milkoreit. 2020. Imagination and transformations to sustainable and just futures. *Elementa: Science of the Anthropocene* 8(1):081. <https://doi.org/10.1525/elementa.2020.081>
- Norris, J. 2008. Collage. Pages 95-97 in L. M. Given, editor. *The SAGE encyclopedia of qualitative research methods*. SAGE, Thousand Oaks, California, USA.
- Norström, A. V., C. Cvitanovic, M. F. Löf, S. West, C. Wyborn, P. Balvanera, A. T. Bednarek, E. M. Bennett, R. Biggs, A. de Bremond, B. M. Campbell, J. G. Canadell, S. R. Carpenter, C. Folke, E. A. Fulton, O. Gaffney, S. Gelcich, J.-B. Jouffray, M. Leach, M. Le Tissier, B. Martín-López, E. Louder, M.-F. Loutre, A. M. Meadow, H. Nagendra, D. Payne, G. D. Peterson, B. Reyers, R. Scholes, C. I. Speranza, M. Spierenburg, M. Stafford-Smith, M. Tengö, S. van der Hel, I. van Putten, and H. Österblom. 2020. Principles for knowledge co-production in sustainability research. *Nature Sustainability* 3:182-190. <https://doi.org/10.1038/s41893-019-0448-2>
- Nthane, T. T., F. Saunders, G. L. Gallardo Fernández, and S. Raemaekers. 2020. Toward sustainability of South African small-scale fisheries leveraging ICT transformation pathways. *Sustainability* 12(2):743. <https://doi.org/10.3390/su12020743>
- Oomen, J., J. Hoffman, and M. A. Hajer. 2022. Techniques of futuring: on how imagined futures become socially performative. *European Journal of Social Theory* 25(2):252-270. <https://doi.org/10.1177/1368431020988826>
- Overå, R. 2011. Modernisation narratives and small-scale fisheries in Ghana and Zambia. *Forum for Development Studies* 38(3):321-343. <https://doi.org/10.1080/08039410.2011.596569>
- Öztekin, E. E., and İ. Gaziulusoy. 2021. Co-positioning design for sustainability transitions, practice theory and transitions theories: towards dialogue and collaboration. *Journal of Design Research* 18(3-4):196-223. <https://doi.org/10.1504/JDR.2020.115935>
- Paasche, Ø., and H. Österblom. 2019. Unsustainable science. *One Earth* 1(1):39-42. <https://doi.org/10.1016/j.oneear.2019.08.011>
- Pereira, L., E. Bennett, R. Biggs, G. Peterson, T. McPhearson, A. V. Norström, P. Olsson, R. Preiser, C. Raudsepp-Hearne, and J. Vervoort. 2018b. Seeds of the future in the present: exploring pathways for navigating towards “good” Anthropocenes. Pages 327-350 in T. Elmqvist, X. Bai, N. Frantzeskaki, C. Griffith, D. Maddox, T. McPhearson, S. Parnell, P. Romero-Lankao, D. Simone, and M. Watkins, editors. *Urban planet: knowledge towards sustainable cities*. Cambridge University Press, Cambridge, UK. <https://doi.org/10.1017/9781316647554.018>
- Pereira, L. M., G. O. Crespo, D. J. Amon, R. Badhe, S. Bandeira, F. Bengtsson, M. Boettcher, G. Carmine, W. W. L. Cheung, B. Chibwe, D. Dunn, M. A. Gasalla, G. Halouani, D. E. Johnson, J.-B. Jouffray, S. Juri, P. W. Keys, H. M. Lübker, A. S. Merrie, F. Obaidullah, J. Palacios-Abrantes, L. J. Shannon, U. R. Sumaila, E. Superchi, N. Terry, C. C. C. Wabnitz, M. Yasuhara, and W. Zhou. 2023. The living infinite: envisioning futures for transformed human-nature relationships on the high seas. *Marine Policy* 153:105644. <https://doi.org/10.1016/j.marpol.2023.105644>
- Pereira, L. M., N. Frantzeskaki, A. Hebinck, L. Charli-Joseph, S. Drimie, M. Dyer, H. Eakin, D. Galafassi, T. Karpouzoglou, F. Marshall, M.-L. Moore, P. Olsson, J. M. Siqueiros-García, P. van Zwanenberg, and J. M. Vervoort. 2020. Transformative spaces in the making: key lessons from nine cases in the Global South. *Sustainability Science* 15:161-178. <https://doi.org/10.1007/s11625-019-00749-x>
- Pereira, L. M., T. Karpouzoglou, N. Frantzeskaki, and P. Olsson. 2018a. Designing transformative spaces for sustainability in social-ecological systems. *Ecology and Society* 23(4):32. <https://doi.org/10.5751/ES-10607-230432>
- Pereira, L., N. Sitas, F. Ravera, A. Jimenez-Aceituno, and A. Merrie. 2019. Building capacities for transformative change towards sustainability: imagination in intergovernmental science-policy scenario processes. *Elementa: Science of the Anthropocene* 7:35. <https://doi.org/10.1525/elementa.374>
- Rathwell, K. J., and D. Armitage. 2016. Art and artistic processes bridge knowledge systems about social-ecological change: an empirical examination with Inuit artists from Nunavut, Canada. *Ecology and Society* 21(2):21. <https://doi.org/10.5751/ES-08369-210221>
- Rathwell, K. J., D. Armitage, and F. Berkes. 2015. Bridging knowledge systems to enhance governance of environmental commons: a typology of settings. *International Journal of the Commons* 9(2):851-880. <https://doi.org/10.18352/ijc.584>
- Riedy, C. 2020. Discourse coalitions for sustainability transformations: common ground and conflict beyond neoliberalism. *Current Opinion in Environmental Sustainability* 45:100-112. <https://doi.org/10.1016/j.cosust.2020.09.014>
- Sanders, E. B. N., and P. J. Stappers. 2008. Co-creation and the new landscapes of design. *CoDesign* 4(1):5-18. <https://doi.org/10.1080/15710880701875068>
- Santos, P., M. Trimble, and D. Johnson. 2021. Balancing hope and disappointment: representation, social wellbeing, and the future of small-scale fisheries in Uruguay. *Development in Practice* 31:580-591. <https://doi.org/10.1080/09614524.2021.1907532>
- Saunders, F. P., G. L. Gallardo-Fernández, T. Van Tuyen, S. Raemaekers, B. Marciniak, and R. D. Plá. 2016. Transformation of small-scale fisheries—critical transdisciplinary challenges and possibilities. *Current Opinion in Environmental Sustainability* 20:26-31. <https://doi.org/10.1016/j.cosust.2016.04.005>
- Scheffer, M., and N. Mazzeo. 2019. How to build a cross-disciplinary institute: the curious case of the South American Institute for Resilience and Sustainability Studies. *Ecology and Society* 24(2):34. <https://doi.org/10.5751/ES-10983-240234>
- Schreiber, M. A., R. Chuenpagdee, and S. Jentoft. 2022. Blue justice and the co-production of hermeneutical resources for small-scale fisheries. *Marine Policy* 137:104959. <https://doi.org/10.1016/j.marpol.2022.104959>
- Scoones, I., A. Stirling, D. Abrol, J. Atela, L. Charli-Joseph, H. Eakin, A. Ely, P. Olsson, L. Pereira, R. Priya, P. van Zwanenberg, and L. Yang. 2020. Transformations to sustainability: combining structural, systemic and enabling approaches. *Current Opinion in Environmental Sustainability* 42:65-75. <https://doi.org/10.1016/j.cosust.2019.12.004>

- Sellberg, M. M., A. V. Norström, G. D. Peterson, and L. J. Gordon. 2020. Using local initiatives to envision sustainable and resilient food systems in the Stockholm city-region. *Global Food Security* 24:100334. <https://doi.org/10.1016/j.gfs.2019.100334>
- Short, R. E., S. Gelcich, D. C. Little, F. Micheli, E. H. Allison, X. Basurto, B. Belton, C. Brugere, S. R. Bush, L. Cao, B. Crona, P. J. Cohen, O. Defeo, P. Edwards, C. E. Ferguson, N. Franz, C. D. Golden, B. S. Halpern, L. Hazen, C. Hicks, D. Johnson, A. M. Kaminski, S. Mangubhai, R. L. Naylor, M. Reantaso, U. R. Sumaila, S. H. Thilsted, M. Tigchelaar, C. C. C. Wabnitz, and W. Zhang. 2021. Harnessing the diversity of small-scale actors is key to the future of aquatic food systems. *Nature Food* 2(9):733-741. <https://doi.org/10.1038/s43016-021-00363-0>
- Singh, A. 2011. Visual artefacts as boundary objects in participatory research paradigm. *Journal of Visual Art Practice* 10(1):35-50. https://doi.org/10.1386/jvap.10.1.35_1
- Smith, H., and X. Basurto. 2019. Defining small-scale fisheries and examining the role of science in shaping perceptions of who and what counts: a systematic review. *Frontiers in Marine Science* 6:236. <https://doi.org/10.3389/fmars.2019.00236>
- St. Martin, K. 2005. Mapping economic diversity in the First World: the case of fisheries. *Environment and Planning* 37(6):959-979. <https://doi.org/10.1068/a36296>
- Star, S. L., and J. R. Griesemer. 1989. Institutional ecology, 'translations' and boundary objects: amateurs and professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science* 19(3):387-420. <https://doi.org/10.1177/030631289019003001>
- Tengö, M., E. S. Brondizio, T. Elmqvist, P. Malmer, and M. Spierenburg. 2014. Connecting diverse knowledge systems for enhanced ecosystem governance: the multiple evidence base approach. *Ambio* 43(5):579-591. <https://doi.org/10.1007/s13280-014-0501-3>
- Tigchelaar, M., J. Leape, F. Micheli, E. H. Allison, X. Basurto, A. Bennett, S. R. Bush, L. Cao, W. W. L. Cheung, B. Crona, F. DeClerck, J. Fanzo, S. Gelcich, J. A. Gephart, C. D. Golden, B. S. Halpern, C. C. Hicks, M. Jonell, A. Kishore, J. Z. Koehn, D. C. Little, R. L. Naylor, M. J. Phillips, E. R. Selig, R. E. Short, U. R. Sumaila, S. H. Thilsted, M. Troell, and C. C. C. Wabnitz. 2022. The vital roles of blue foods in the global food system. *Global Food Security* 33:100637. <https://doi.org/10.1016/j.gfs.2022.100637>
- Trimble, M., and D. Johnson. 2013. Artisanal fishing as an undesirable way of life? The implications for governance of fishers' wellbeing aspirations in coastal Uruguay and southeastern Brazil. *Marine Policy* 37:37-44. <https://doi.org/10.1016/j.marpol.2012.04.002>
- Van der Helm, R. 2009. The vision phenomenon: towards a theoretical underpinning of visions of the future and the process of envisioning. *Futures* 41:96-104. <https://doi.org/10.1016/j.futures.2008.07.036>
- Vaughan, K. 2005. Pieced together: collage as an artist's method for interdisciplinary research. *International Journal of Qualitative Methods* 4(1):27-52. <https://doi.org/10.1177/160940690500400103>
- Villasante, S., I. Gianelli, M. Castrejón, L. Nahuelhual, L. Ortega, U. R. Sumaila, and O. Defeo. 2022. Social-ecological shifts, traps and collapses in small-scale fisheries: envisioning a way forward to transformative changes. *Marine Policy* 136:104933. <https://doi.org/10.1016/j.marpol.2021.104933>
- Villasante, S., A. Tubío, I. Gianelli, P. Pita, and A. García-Allut. 2021. Ever changing times: sustainability transformations of Galician small-scale fisheries. *Frontiers in Marine Science* 8. <https://doi.org/10.3389/fmars.2021.712819>
- Virdin, J., G. Nico, N. Franz, S. Vannuccini, C. Anderson, M. M. Mancha-Cisneros, A. Baio, A. Bennett, E. Fontenele, R. Gozzer Wuest, J. Grillo, S. Harper, P. Muhonda, E. Rice, and J. C. Sueiro. 2023. Small-scale fisheries contributions to economic value and livelihoods. Pages 81-126 in FAO, Duke University, and WorldFish. *Illuminating hidden harvests: the contributions of small-scale fisheries to sustainable development*. FAO, Rome, Italy; Duke University Press, Durham, North Carolina, USA; WorldFish, Penang, Malaysia.
- Wall, T. U., A. M. Meadow, and A. Horganic. 2017. Developing evaluation indicators to improve the process of coproducing usable climate science. *Weather, Climate and Society* 9:95-107. <https://doi.org/10.1175/WCAS-D-16-0008.1>
- Westlund, L., and J. Zelasney. 2019. Securing sustainable small-scale fisheries: sharing good practices from around the world. *FAO Fisheries and Aquaculture Technical Paper No. 644*. FAO, Rome, Italy.
- Wiek, A., and D. Iwaniec. 2014. Quality criteria for visions and visioning in sustainability science. *Sustainability Science* 9:497-512. <https://doi.org/10.1007/s11625-013-0208-6>
- Wittmayer, J. M., J. Backhaus, F. Avelino, B. Pel, T. Strasser, I. Kunze, and L. Zuijderwijk. 2019. Narratives of change: how social innovation initiatives construct societal transformation. *Futures* 112:102433. <https://doi.org/10.1016/j.futures.2019.06.005>
- Willett, W., J. Rockström, B. Loken, M. Springmann, T. Lang, S. Vermeulen, T. Garnett, D. Tilman, F. DeClerck, A. Wood, M. Jonell, M. Clark, L. J. Gordon, J. Fanzo, C. Hawkes, R. Zurayk, J. A. Rivera, W. De Vries, L. Majele Sibanda, A. Afshin, A. Chaudhary, M. Herrero, R. Agustina, F. Branca, A. Lartey, S. Fan, B. Crona, E. Fox, V. Bignet, M. Troell, T. Lindahl, S. Singh, S. E. Cornell, K. Srinath Reddy, S. Narain Nishtar, and C. J. L. Murray. 2019. Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. *Lancet* 393:447-492. [https://doi.org/10.1016/S0140-6736\(18\)31788-4](https://doi.org/10.1016/S0140-6736(18)31788-4)
- Zurba, M., and F. Berkes. 2014. Caring for country through participatory art: creating a boundary object for communicating Indigenous knowledge and values. *Local Environment* 19:821-836. <https://doi.org/10.1080/13549839.2013.792051>
- Zurba, M., and M. Trimble. 2014. Youth as the inheritors of collaboration: crises and factors that influence participation of the next generation in natural resource management. *Environmental Science & Policy* 42:78-87. <https://doi.org/10.1016/j.envsci.2014.05.009>