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INDIVIDUAL PORTFOLIO IN SUSTAINABLE DEVELOPMENT

Fungi & Sustainable Food Systems

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KU LEUVEN

1. Learning Framework: Goals & Knowledge Foundations

1.1. Learning goal

To examine the role of fungi in sustainable food systems through a biocultural diversity lens, addressing ecological functions, food cultures, and intercultural knowledge as central dimensions of sustainability thinking.



Helvella crispa, Kessel-la 2025

1.2. Preparatory resources

Resource 1. Fungi, Sustainability, and Biocultural Diversity (Literature review)

Bell et al. (2022); Cocks (2010); Dai et al. (2021); Derbyshire et al. (2025); Gamboa-Trujillo (2019); Ostendorf-Rodríguez et al. (2023); Pérez-Moreno et al. (2021).



Fungi illustrate sustainability beyond human-centered perspectives, highlighting ecological interdependence, reciprocity, and cultural embeddedness. They mediate nutrient cycling, symbiosis, wild populations' stability, while providing nutrition, materials and bioactive compounds. Cultural practices reflect biocultural identities, shaping inclusive, adaptive food systems. This literature review made me analyze Fungi as agents connecting ecology, society, and gastronomy. This was the starting point to design participatory activities that foster culturally awareness and ecologically responsive sustainability practices.

Resource 2: Documentary & Interview with Giuliana Furci

Flora, Fauna, Funga (National Geographic, 2025)

The documentary and Giuliana Furci's interview highlighted fungi as integral to biodiversity and sustainability, emphasizing the "Funga" concept alongside Flora and Fauna. Fungi function as ecological connectors and cultural symbols, linking conservation, local knowledge, and sustainable livelihoods. Furci's work demonstrates how interdisciplinary, cross-cultural approaches and participatory outreach can raise awareness and inform policy. These insights also showed me that fungi can act as tools for inclusive and culturally grounded sustainability education.



Resource 3: Personal interviews – Insights from Belgium & Ecuador

Thibaut Wagner & Cristina Toapanta, 2025



Interviews showed how fungi can foster ecological, social, and cultural connectivity across diverse contexts. Participants highlighted challenges and opportunities in community engagement, science communication, and education, emphasizing collaboration, inclusivity, and grassroots initiatives. Insights reveal fungi as catalysts for learning, cultural exchange, and sustainability thinking, for participatory and interdisciplinary approaches. These perspectives guide the design of educational outputs that integrate ecology and local knowledge, emphasizing biocultural awareness and multispecies sensibilities.

Resource 4: Conference – Sensing Fungi (Vienna, Austria, 2025)

Maja-Lisa Müller, Feifei Zhou, Julia Ihs, Yasmine Ostendorf-Rodríguez

Interdisciplinary presentations framed fungi also as a source of creativity, ethical practice, and systemic thinking, linking ecology, art, and sustainability. Concepts such as mycelial circularity, remediation, and polyphony illustrated ecological interconnectedness and multispecies ethics. Artistic and historical perspectives expanded understanding of fungi's roles beyond utility, highlighting relational ontologies and collaborative knowledge. Insights from this event showed me how these “fungi teachings” inform participatory sustainability education by demonstrating innovative ways to communicate biocultural diversity through creative engagement.



Resource 5: FungiFest Belgium 2nd edition, 2025



FungiFest exemplified ecological, nutritional, and cultural aspects of fungi in practice, demonstrating participatory approaches to sustainable food systems and community engagement.

Networking with organizers and participants empowers self-organization, cross-cultural collaboration, and the integration of scientific knowledge with food production, gastronomy and education. These insights reinforced fungi as active agents in promoting biocultural awareness, hands-on sustainability learning, and the development of inclusive, experiential educational outputs that connect theory and practice.

1.3. Contribution of the Preparatory Resources to the Learning Objective & Academic Output

The five preparatory resources contributed to the design, content, and pedagogical approach of my contribution to our collaborative workshop, enabling me to advance my learning goal of exploring fungi as connectors between ecology, culture, and sustainable food systems. The literature review provided the scientific basis on fungal ecology, nutritional value, and ethnomycology, with biocultural diversity offering a key theoretical lens to understand fungi as ecologically embedded and culturally meaningful organisms rather than isolated resources.

Media-based and interview resources contributed highly to cross-cultural perspectives on fungal conservation, education, and participatory practices. These sources emphasized community engagement and co-creation, directly shaping the experiential format of the cooking class, where we interacted with “non-usual” mushrooms (oyster and lion’s mane), exchanged knowledge, and reflected on sustainability through intercultural food practices.

Insights from the Sensing Fungi conference encouraged a shift from viewing fungi solely as food or ecological actors toward using them as analytical lenses for sustainability thinking. Specifically, fungal characteristics (such as symbiosis, decomposition, and circular nutrient flows) were employed during the workshop to challenge linear, human-centered models of food systems. For example, fungi-based adaptations of traditional dishes allowed participants to reflect on interdependence, circularity, and cultural specificity in food production and consumption, rather than framing sustainability as simple substitution.

Finally, the hands-on experience at FungiFest Belgium reinforced practical knowledge on fungal cultivation, supply chains, and participatory learning, informing mushroom selection and how to present the cooking demonstration. Together, these resources laid the groundwork for a multi-sensory, inclusive workshop grounded in both theory and practice. They also supported my analytical development, demonstrating how fungi can function simultaneously as ecological organisms, cultural mediators, and conceptual tools for rethinking sustainability in food systems.

2. Documentation of the Knowledge-Sharing Activity (Academic Output)



Final title: Our Future Food Systems: Promoting Fungi and Aquatic Product as Our Future Food

Format: Talk show and Cooking Class

Date, place: 22 November 2025, Pangaea Meeting Centre.

Target audience: General public

Collaborators: Ifan Martino (Guest Speaker); Fungi Minds - Thibaut Wagner & Allison Guaraca (audiovisual and logistics); Nadya Rosianti (Indonesian cuisine' chef).

Description: The current global food system has become the primary driver of environmental pressures. Globally, 50% of land surfaces are used to produce food as agricultural land. Almost 80% of it is dedicated only to producing livestock and their fodder (like soybeans). It results in massive land-use change (deforestation) and high greenhouse gas (GHG) emissions. To reverse this trend, changing consumption patterns to alternative sources is considerably one of the solutions to reduce pressure. Through an interactive talk show, we bring together the current issues in our food systems and promote consumption shifting to fungi and aquatic products to advancing sustainability. In addition, the discussion was followed by a cooking class to share intercultural perspective from the Global South by showcasing traditional dishes from Ecuador and Indonesia. Finally, pre- and post-event surveys were integrated to capture participants' perspectives and learning processes. The event was also a learning experience for us as facilitators, reinforcing the value of participatory, multisensory approaches for imagining inclusive, sustainable and delicious food futures.



Outcome and Impacts: Pre- and post-event surveys were conducted to measure knowledge improvement, behavioral change, and event feedback. The pre-survey also includes registration forms and baseline knowledge on food systems, fungi, and aquatic foods (26 responses). All respondents were able to define the food systems, and 73.1% can identify the GHG sources. Respondents are more familiar with fungi (92.3%) than with aquatic foods (80.8%). Due to limited spaces, we only chose the first 15 participants who completed the survey and registration form, who also filled out the post-survey. We added questions to the knowledge section and added two other sections about perspective change and feedback. Post-event knowledge has been improved, 90.9% can identify GHG sources, 81.9% can recognize deforestation drivers in tropical areas, and 100% define aquatic foods correctly. Participants reported interest in making fungi and aquatic foods to their diets. They are motivated to try new recipes, sustainability, and health aspects. Participants also reported a perspective change (81.8%) on food systems, found the session has rich knowledge (91% agree/strongly agree), and were willing to share insights with their families and friends (100%), particularly about nutritious or healthy diet options and environmental performance of the food, and the recipes which they had tried.

Links to the output: The workshop was held in person as a combined talk show and cooking class, with a direct interaction with participants.

- Slides: [Workshop Food Systems 2025](#)
- Short video (Instagram): [Fungi & Aquatic food](#)
- Post (Instagram): [Reflections workshop](#)

3. Reflexive analysis

The preparatory phase and collaborative workshop represent a critical learning milestone in my academic trajectory. Fungi have been my research objects but also my passion for almost a decade. From the Ecuadorian Andes, Amazon, and Galapagos, to the temperate forests in Belgium, I liked to learn from fungi and share the experience with friends and family. This project made it possible to reach a larger public interested in Sustainable Food Systems, and hopefully, now more into mushrooms in a broader sustainability framework. As well, this project functioned as a translational space where theoretical frameworks, empirical evidence, and participatory practice continuously informed one another.

The knowledge-building phase was grounded in academic literature on sustainable food systems, alternative proteins, fungi, aquatic foods, and biocultural diversity. Engaging with these concepts enabled me to analyze fungi not only as nutritional inputs but as ecological and cultural agents embedded within complex food systems. Analytically, this shifted my understanding of sustainability from a human-centered optimization problem towards a relational perspective emphasizing interdependence, adaptability, and cultural context. For this reason, I looked at fungi not just as a metaphor of these concepts, I portrayed them under analytical lenses.

Within a biocultural diversity framework, fungi are not merely biological resources but relational beings embedded in socioecological systems, with cultural practices that have co-evolved within specific ecosystems over time. From an ecological perspective, fungi play indispensable roles in nutrient cycling, soil formation, plant health, and ecosystem resilience. Mycorrhizal associations, for example, sustain forest productivity and stability by facilitating nutrient exchange and communication among plants, while saprotrophic fungi drive decomposition processes that close nutrient loops. These roles challenge linear models of





Agaricaceae, Galapagos 2024



Cyathus striatus, Galapagos 2022



Agaricaceae & Homo sapiens, Galapagos 2023

sustainability that prioritize extraction and efficiency, instead stressing circularity, reciprocity, and multispecies co-dependence as core sustainability principles.

Biocultural diversity recognizes the linked erosion of biological diversity and cultural diversity under globalized, industrial systems. Fungi sit at this intersection: many fungal species are essential to Indigenous communities and local foodways, medicinal practices, agricultural calendars, and cultural identities. Traditional practices of mushroom foraging, cultivation, fermentation, and culinary use reflect place-based ecological knowledge and adaptive strategies that support both biodiversity conservation and food sovereignty. When such practices are marginalized or lost, ecological knowledge and cultural meanings disappear alongside fungal species and habitats.

In the context of sustainable food systems, fungi offer alternatives to dominant livestock-based models that are ecologically intensive and socially inequitable. Edible fungi provide nutritious, low-impact protein sources that require minimal land, water, and inputs, while fungal fermentation and mycoproteins illustrate how sustainability can be reached through regeneration rather than substitution alone. However, from a biocultural perspective, the value of fungi does not lie only in their efficiency, but in their capacity to reconnect food production with cultural meaning, care, and relational ethics.

Importantly, fungi also function as pedagogical and conceptual tools for sustainability thinking. Their life strategies (as networked growth, cooperation across species, and responsiveness to environmental change) invite relational ontologies that question human centrism. Engaging with fungi through participatory practices such as cooking, foraging, cultivation, and artistic exploration enables embodied learning that bridges scientific knowledge and live experience. These multisensory engagements foster ecological awareness while respecting cultural specificity, making sustainability education more inclusive and context-sensitive.

Situating fungi within biocultural diversity thus reframes sustainability as a collective, multispecies process rooted in relationships rather than resources. Fungi remind us that resilient futures depend not only on technological advances but on the preservation and regeneration of ecological relationships, cultural knowledge, and ethical responsibilities across species. In this sense, fungi act as connectors that link ecology, culture, and sustainability, and at the same time, offer both practical pathways and conceptual guidance for imagining more fair and adaptive food systems.

These insights shaped both the content and the structure of the workshop, particularly the decision to combine a talkshow format with a hands-on cooking session. And rather than prioritizing information transmission, the workshop emphasized experiential learning, dialogue, and collective sense-making. Cooking and tasting became methodological tools to surface questions of sustainability, accessibility, and cultural identity, allowing participants to engage with food systems in embodied and relational ways.

Methodologically, this experience strengthened my capacity to design and learn from participatory action research. We employed mixed methods, such as surveys, dialogue, and observation, as reflective and evaluative tools. I also learned to adapt facilitation in real time, prioritizing engagement and collective learning over rigid adherence to schedules or predefined outcomes. That created a comfortable and safe space to collectively rethink sustainability.



Academically, the workshop challenged me to integrate scientific evidence with cultural knowledge and lived experience, reinforcing the importance of biocultural perspectives in sustainability education. Engaging with both scientific literature and non-academic texts, alongside colleagues' experiences, expanded my analytical framework beyond conventional disciplinary boundaries. Exposure to new fields for me, such as art and philosophy, added an interdisciplinary depth to my portfolio and encouraged more reflexive ways of thinking about sustainability.

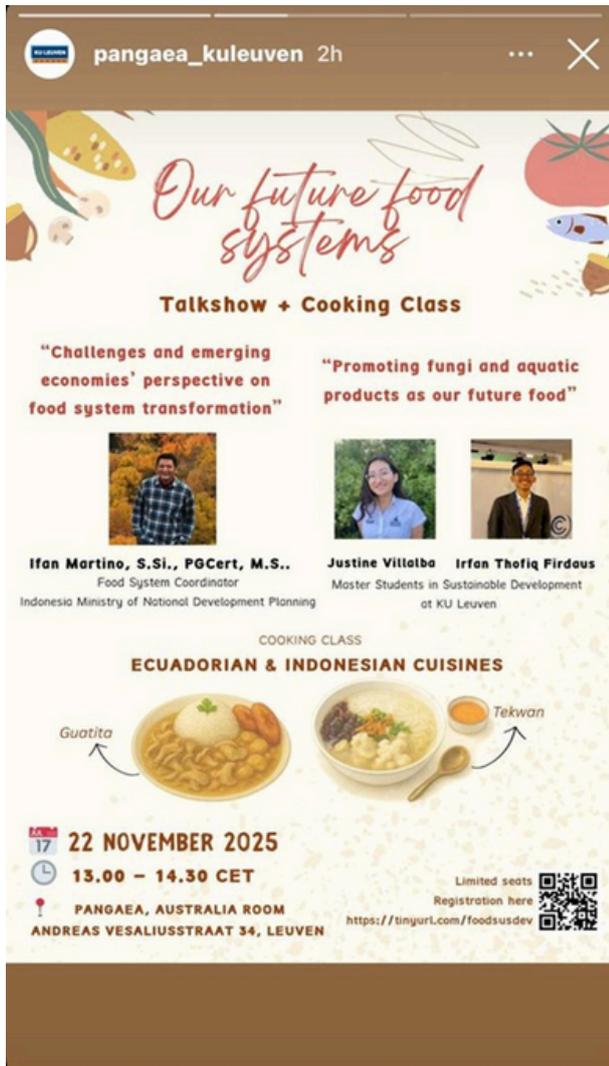
This process also reshaped how I value fungi. While growing my own mushrooms, I could see them not only for their functional roles within food systems or ecosystems, but for their intrinsic qualities as diverse, communicative, and highly adaptive organisms. Learning with fungi, rather than merely about them, has become an ongoing process that continues to inspire my academic development and sustainability thinking daily.

This process has directly shaped my future professional orientation. It confirmed my interest in working at the intersection of ecological research and public engagement, where knowledge production and dissemination are mutually reinforcing. I see participatory, multisensory formats as essential for addressing complex sustainability challenges, particularly those involving dietary change and cultural practices. Moving forward, I aim to further develop research and practice that uses multispecies perspectives, especially fungi, as analytical and pedagogical lenses for fostering resilient, context-sensitive food systems.

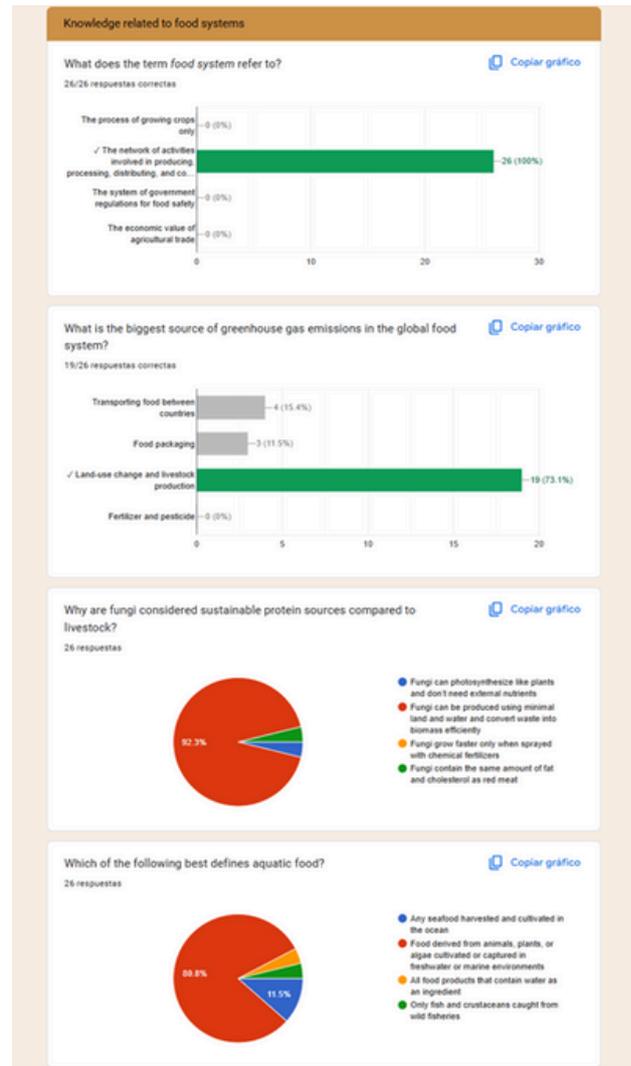


Pleurotus ostreatus & Homo sapiens, Leuven 2025

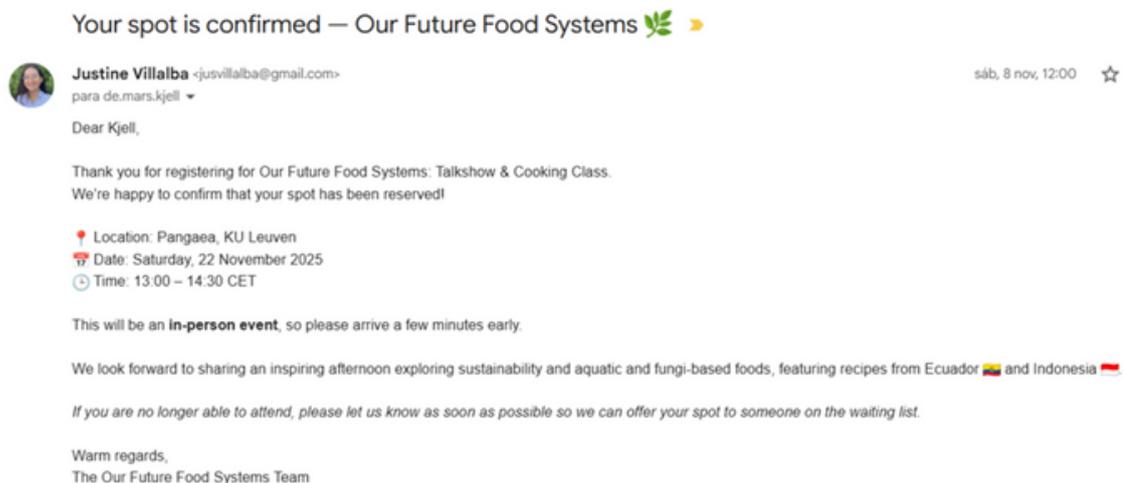
4. Evidence of public dissemination



Event promotion post shared on Pangaea's Instagram



Pre-workshop questionnaire



Example of confirmation emails sent to registered participants prior to the workshop.



Calendar invitation sent to participants to schedule and remind them of the event.

5. References

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