What the Danube Delta Taught Me About Planetary Sustainability: Oral Histories of Adaptation and Ecological Change

Dr. Andreea Mosila
American Public University System
Rocky Mountain College of Art + Design

Abstract

Planetary sustainability is often framed through carbon emissions, sea-level rise, and biodiversity indicators. In regions like Romania's Danube Delta, however, sustainability emerges as a lived experience shaped by nature's rhythms, intergenerational memory, and people's relationships with the natural world. Based on Fulbright-funded fieldwork and oral interviews with women who have endured decades of ecological change, this paper examines the human dimension of environmental fragility. These voices offer insight into community-based resilience grounded in observation, memory, and traditional ecological knowledge. They advocate for a reframing of sustainability as a human endeavor rooted in survival, care, and adaptation.

Keywords: Danube Delta, planetary sustainability, climate change, environmental insecurity, human security, oral history, local ecological knowledge, gender and environment, rural adaptation, relational sustainability, environmental governance, traditional knowledge, climate justice, marginalized communities.

Lo que el delta del Danubio me enseñó sobre la sostenibilidad planetaria: historias orales de adaptación y cambio ecológico

Resumen

La sostenibilidad planetaria suele definirse a través de las emisiones de carbono, el aumento del nivel del mar y los indicadores de biodiversidad. Sin embargo, en regiones como el delta del Danubio en Rumanía, la sostenibilidad emerge como una experiencia vivida, moldeada por los ritmos de la naturaleza, la memoria interge-

 doi: 10.18278/sesa.5.4.15

neracional y las relaciones de las personas con el mundo natural. Basado en trabajo de campo financiado por Fulbright y entrevistas orales con mujeres que han soportado décadas de cambio ecológico, este artículo examina la dimensión humana de la fragilidad ambiental. Estas voces ofrecen una perspectiva sobre la resiliencia comunitaria, basada en la observación, la memoria y el conocimiento ecológico tradicional. Abogan por una reformulación de la sostenibilidad como un esfuerzo humano arraigado en la supervivencia, el cuidado y la adaptación.

Palabras clave: Delta del Danubio, sostenibilidad planetaria, cambio climático, inseguridad ambiental, seguridad humana, historia oral, conocimiento ecológico local, género y medio ambiente, adaptación rural, sostenibilidad relacional, gobernanza ambiental, conocimiento tradicional, justicia climática, comunidades marginadas

多瑙河三角洲所传递的地球可持续性：适应和生态变化的口述历史

摘要

地球可持续性通常以碳排放、海平面上升和生物多样性指标来衡量。然而，在罗马尼亚多瑙河三角洲等地区，可持续性体现为一种受自然韵律、代际记忆以及人与自然关系所塑造的切身体验。本文基于富布赖特资助的实地调查以及对经历了数十年生态变迁的女性的口述访谈，探讨了环境脆弱性的人类维度。这些访谈揭示了基于观察、记忆和传统生态知识的社区复原力。其倡导将可持续性重新定义为一种植根于生存、关怀和适应的人类努力。

关键词：多瑙河三角洲，地球可持续性，气候变化，环境不安全，人类安全，口述历史，地方生态知识，性别与环境，农村适应，关系可持续性，环境治理，传统知识，气候正义，边缘化社区

Introduction

Planetary sustainability is most often discussed through a scientific lens, via climate models, carbon targets, and ecosystem metrics. However, these macro-level tools, while important, do not always provide a complete picture. They can obscure the lived experiences of those most affected by environmental change. In increasingly fragile ecosystems such as

the Danube Delta, climate change is a present reality. Shifting seasons, declining fish stocks, saltwater intrusion, and recurring droughts shape both the landscape and livelihood. Located in southeastern Romania, the Danube Delta, Europe's second-largest wetland and a UNESCO World Heritage Site, embodies both ecological significance and socio-political complexity. The delta represents a nexus between climate and human security. It is a place where shifting hydrological regimes intersect with uneven governance, depopulation, infrastructural neglect, and competing conservation mandates (Mosila, 2025). These pressures unfold through daily disruptions to mobility, food access, healthcare, and economic stability. Sustainability here cannot be reduced to emissions targets or biodiversity counts. It must also contend with who gets to stay, who adapts and how, and whose knowledge counts in shaping environmental futures. Sustainability in deltas is inherently relational and security-linked, shaped by biophysical indicators as well as histories of governance, gendered labor, and the power to remain in place (Mosila, 2025).

Peripheral, rural, vulnerable, and often-overlooked communities, especially women, possess rich traditions of environmental knowledge. They are versed in intergenerational adaptation and experience that can inform more just and inclusive models of planetary sustainability. These insights become visible when documented through oral histories and field observations.

Sustainability as a Lived Experience

Conventional sustainability tools effectively capture global trends. However, they often exclude rural and ecologically vulnerable voices (Vaidianu et al., 2014), reinforcing hierarchies that prioritize scientific data over sensory and cultural knowledge, which remains invisible (Van Assche et al., 2012; Richardson, 2019). This research proposes an alternative framing: sustainability as a lived relationship between people and place. Delta inhabitants speak the language of disrupted drought cycles, fish that no longer return, and ancestral planting calendars that no longer align with the weather. These forms of local ecological knowledge challenge the reductive logic of indicator-based sustainability (van Assche et al., 2011), revealing how adaptation unfolds through daily improvisation and care. They point to sustainability frameworks that remain scientific while also valuing diverse knowledge and ethical context (Şerban, 2023).

The Danube Delta: Ecological and Social Context

The Danube Delta is one of the most dynamic and fragile wetland systems in Europe. It is home to over 300 bird species, dozens of wetland ecosystems, and hundreds of people who live in small, low-lying communities accessible only by boat. The region is an entangled site of ecological vulnerability and social mar-

ginality, historically affected by multiple empires, resource regimes, and post-socialist transitions (Iordachi and van Assche, 2015). Residents of delta villages face the cumulative effects of climate change impacts, including canal silting, drought-flood cycles, reed fires, and collapsing fisheries, as well as infrastructure decay and policy neglect. These are not isolated problems. They are perceived locally as slow processes of terrestrialization (Richardson, 2019) or liquid territories (Constantinescu & Tănăsescu, 2022), where land and water relations are constantly shifting, along with the ability to sustain life.

Residents interpret these changes as historical and relational, deeply tied to memory, identity, and social justice. The concept of traumatic nature (Assche et al., 2012) helps frame how state-led conservation, fishing bans, and bureaucratic decisions have contributed to environmental precarity, as well as profound feelings of injustice and disempowerment.

Methodology: An Oral History Approach

To understand these complex interrelations, this research employs an oral history methodology grounded in year-long fieldwork and participatory observation. I conducted interviews with women elders, fishers' wives, and local caregivers, many of whom have navigated multiple transitions, from socialism to neoliberalism, from stability to uncertainty, from abundance to precarity. In addition, field observations were anchors for oral history, as flooded homes, dried canals, abandoned boats, and family rituals sparked memories and layered interpretations of ecological change. I returned seasonally, documenting physical, emotional, and cultural erosion through the lens of "slow ecology" (Şerban, 2023 This method aligns with other research using cognitive mapping, cartographic analysis, and ethnography to capture the complexity of socio- ecological systems in the delta (Tănăsescu & Constantinescu, 2020). It revealed that local knowledge is embodied, shaped by relationships, and continually evolving. Fixed models or linear timelines cannot fully capture this experience.

Findings: Gendered Perspectives on Climate and Adaptation

The collected data revealed four interrelated themes of how delta residents experience and respond to environmental change. Temporal disruption emerged as a recurring concern. Traditional planting and fishing cycles, once guided by lunar calendars and seasonal rhythms, have become increasingly unreliable. Women expressed confusion about when to plant, harvest, or fish, indicating a broader breakdown in intergenerational knowledge transmission (Constantin, 2012). In addition, there is a persistent tension between local practices and formal governance.

Knowledge conflicts arise when top-down conservation models marginalize or criminalize the very techniques

that have sustained communities for generations. Policies of the Danube Delta Biosphere Reserve (DDBR) have historically undermined traditional rights and access to resources, exacerbating a sense of exclusion among residents (van Assche et al., 2011; Vaidianu et al., 2014). However, despite these constraints, many residents have developed hybrid socio- ecological strategies that blend modern technologies with ancestral knowledge systems to navigate uncertainty. These adaptive practices reflect a form of resilience grounded in flexibility and experimentation (Constantinescu & Tănăsescu, 2022). Perhaps most significantly, the data revealed an alternative vision of sustainability rooted in relational ethics rather than metrics or targets. For many women, sustainability is defined by practices of care, including staying in place, maintaining kinship ties, reading the land with attentiveness, and sustaining life in fragile conditions (Richardson, 2019). These findings suggest that lived experience can help re-evaluate what sustainability means, particularly in terms of knowledge, time, and the ways people adapt.

Implications for Earth Sciences and Planetary Defense

The insights from the Danube Delta have broad implications for how planetary sustainability is defined and pursued. They reveal that environmental knowledge is not solely produced in labs or climate centers. It also resides in bodies, homes, and communities. Additionally, the findings uncover the importance of incorporating peripheral voices in environmental governance. Residents are not passive victims of climate change. They are active interpreters, first responders, and archivists of environmental transformation. For Earth sciences and planetary defense, this requires integrative models that link remote sensing with local insights and align data with lived contexts. It calls for ethical listening and openness to recognize knowledge that does not fit into conventional scientific categories, yet it is rigorous and insightful.

Conclusion: Toward a Human-Centered Sustainability

The Danube Delta demonstrates that sustainability may be a scientific target, but also a struggle for continuity and dignity. As such, it is important to recenter the lived experiences of those most affected by environmental change, especially women, elders, and those at the periphery. This offers access to a deeper planetary ethics rooted in care, observation, and endurance. To integrate such perspectives into Earth sciences and planetary defense implies more than simply checking boxes. It demands a genuine epistemic shift that values oral histories as data, emotions as indicators, and local adaptation as a form of planetary innovation. From the margins of Europe, the voices of the Danube Delta offer a compelling invitation to reimagine sustainability as a profoundly human practice of staying, listening, and living well together in a changing world.

References

Constantinescu, Ștefan, and Mihnea Tănăsescu. (2022). "Moving through Liquid Territories: A Cartographic History of Roads in the Danube Delta." *The Geographical Journal* 188 (4): 445–460. https://doi.org/10.1111/geoj.12490.

Iordachi, Constantin, and Kristoff van Assche. (2015). *The Biopolitics of the Danube Delta: Nature, History, Policies*. Budapest: Central European University Press.

Mosila, Andreea I. (2025). "Climate Change and Security Risks in Romania's Danube Delta (Delta Dunării)." ProQuest Dissertations & Theses.

Richardson, Tanya. (2019). "The Terrestrialization of Amphibious Life in a Danube Delta 'Town on Water.'" *Suomen Antropologi: Journal of the Finnish Anthropological Society* 43 (2): 39–58. https://doi.org/10.30676/JFAS.V43I2.73062.

Şerban, Stelu. (2023). "Slow Ecology: Local Knowledge and Natural Restoration on the Lower Danube." *Environmental Values* 32 (1): 37–56. https://doi.org/10.1177/09632719231170511.

Tănăsescu, Mihnea, and Șerban Constantinescu. (2020). "The Human Ecology of the Danube Delta: A Historical and Cartographic Perspective." *Journal of Environmental Management* 271: 110324. https://doi.org/10.1016/j.jenvman.2020.110324.

Vaidianu, Natasa, M.C. Adamescu, M. Wildenberg, and C. Tetelea. (2014). "Understanding Public Participation and Perceptions of Stakeholders for a Better Management in Danube Delta Biosphere Reserve (Romania)." In *Fuzzy Cognitive Maps for Applied Sciences and Engineering*, edited by Elpiniki Papageorgiou, 381–393. Berlin: Springer. https://doi.org/10.1007/978-3-642- 39739-4_19.

Van Assche, Kristof, Raoul Beunen, Joren Jacobs, and Petruta Teampau. (2011). "Crossing Trails in the Marshes: Rigidity and Flexibility in the Governance of the Danube Delta." *Journal of Environmental Planning and Management* 54 (8): 997–1018. https://doi.org/10.1080/09640568.2010.547687.

Van Assche, Kristoff, Sandra Bell, and Petruța Teampău. (2012). "Traumatic Natures of the Swamp: Concepts of Nature in the Romanian Danube Delta." *Environmental Values* 21 (2): 177–198. https://doi.org/10.3197/096327112X13303670567297.