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INTRODUCTION TO THE SPECIAL ISSUE FAERE IN ITS TEENS

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Harold Hotelling's seminal 1931 paper, "The Economics of Exhaustible Resources," begins with an observation that could well describe today's environmental concerns:[1]

> "Contemplation of the world's disappearing supplies of minerals, forests, and other exhaustible assets has led to demands for regulation of their exploitation. The feeling that these products are now too cheap for the good of future generations, that they are being selfishly exploited at too rapid a rate, and that in consequence of their excessive cheapness they are being produced and consumed wastefully has given rise to the conservation movement." Hotelling (1931)

Nearly a century later, the field of environmental and resource economics continues to wrestle with how to manage scarce resources and mitigate externalities—now on a global scale—see, Libecap (2014) and Heal (2017). Although the term "environmental economics" gained prominence only in the 1960s, its intellectual roots extend over two centuries. As Sandmo (2015) shows, early economic thinkers in the eighteenth and nineteenth centuries were already grappling with resource scarcity, externalities, and human-nature interactions. Foundational contributions like Hotelling (1931), Gordon (1954) and Coase (1960) drew on these traditions. Surveys by Cropper and Oates (1992) and Krautkraemer (1998) mapped the landscape of environmental economics and resource scarcity in the mid-1990s.

Carbon pricing, once a theoretical curiosity, now features prominently in climate policy debates (Timilsina (2022)). Its efficacy, however, depends on political economy considerations, echoing the importance of transaction costs first highlighted by Coase (1960) and more recently examined by Medema (2020). Such insights remain central as policy instruments evolve.

Nevertheless, sound theoretical prescriptions do not always yield effective policy outcomes. The growing literature on "envirodevonomics" (Greenstone and Jack (2015)) highlights how institutional, political, and market failures often obstruct the implementation of even well-designed environmental measures, see also Guesnerie (1974). Reflecting this complexity, the *Journal of Economic Perspectives* has hosted several key symposia on oil and gas markets (Winter 2016), climate change (Fall 2018), U.S. environmental legislation (Fall 2019), and international dimensions of climate change policy (Summer 2023).

Finally, the discourse has turned to ethical dimensions. Choosing a social discount rate, as Millner and Heal (2023) emphasize, is not merely a technical issue but also involves reconciling diverse normative perspectives on intergenerational equity. The challenge

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[1]See Devarajan and Fisher (1981) for a celebration of Hotelling's article fifty years after its publication and Gaspard et al. (2024) for a Journey into Harold Hotelling's Economics.

originally posed by Hotelling's focus on resource depletion now underpins debates on climate policy and habitat conservation policies, linking past insights to the global and ethically charged questions shaping current and future environmental decision-making.[2]

1. A JOURNEY TO THE CENTER OF ENVIRONMENTAL ECONOMICS

> "The heat was increasing in a manner to cause us the most fearful anxiety, and certainly the temperature was at this moment at the height of 100° Fahrenheit."[3]
>
> From Jules Verne, *A Journey to the Centre of the Earth* (1864)

While Jules Verne's explorers confront intensifying conditions as they descend, FAERE economists face increasingly complex and urgent challenges the deeper they probe into the interactions between human activity and our planet's natural systems.

This issue gathers a selection of eight contributed papers presented at the 10th annual congress of the French Association of Environmental and Resource Economists (FAERE), held in Montpellier in September 2023. These articles provide an opportunity both to celebrate a decade of FAERE's achievements and to look ahead to the future challenges and directions in environmental and resource economics.

Over its first decade, FAERE has played a pivotal role in structuring the community of environmental and resource economists within French research institutions and affiliated networks. It has supported both early-career and established researchers, helping them shape their research agendas and providing opportunities for intellectual exchange. During this period, the methodological proficiency of members, particularly PhD candidates, has dramatically increased. International peers have recognized FAERE's contributions, evidenced by its growing presence on editorial boards of leading journals and in the governance of the European association, as well as by frequent invitations for its members to deliver plenary lectures and participate in panel discussions at European conferences. In addition, association members have influenced the development of advanced educational programs aligned with students' aspirations to address sustainable development challenges. Beyond academia, French environmental economists have also actively engaged in public discourse, contributing to institutional committees and appearing in various media outlets.

What explains the notable progress of environmental economics in France during the first quarter of this century? Drawing on Sandmo (2015)'s perspective, we can identify two key drivers behind the emergence of this field roughly 75 years ago:

> "[t]he interactions between [...] two sets of factors might go a long way toward explaining the increased attention to environmental issues in economics [...] On the one hand, one could cite the growth of environmental problems arising from increasing industrialization, energy use, and the pressure of population. On the other hand, one could also argue that increasing

[2] See also Guesnerie (2004) and Gueant et al. (2012). Environmental economics addresses ethical concerns that extend beyond the key issue of intergenerational equity. These include fairness and historical responsibilities in burden sharing Lange et al. (2010), the regressive impacts of environmental regulations, specifically on environmental justice Banzhaf et al. (2019), and the possibility of abandoning anthropocentrism, i.e., extending welfare criteria beyond the instrumental nature's instrumental value to humans Treich (2022).

[3] For readers more comfortable with metric units, 100° Fahrenheit corresponds to 37.8° Celsius.

> standards of living, particularly in the industrialized world, have led to an increased demand for environmental quality; that is, the appreciation of environmental goods is income elastic."
>
> Sandmo (2015), (p. 61)

Sandmo's interpretative framework thus suggests examining both the intensifying environmental pressures and the growing societal willingness to confront them. In the French context, these factors likely combined to spur greater interest in environmental economics and the development of institutions like FAERE.

Over the past twenty-five years, France has experienced a wide array of environmental pressures and policy debates, unfolding like a complex and often dissonant symphony. The opening movement began at the turn of the century as the country was still recovering from the Martin and Lothar storms. Midway through, Cyclone Xynthia accelerated the tempo of concern about coastal flooding. As the finale approached, a month-long wildfire sounded a percussive alarm on land management. Beneath these headline events ran a steady counterpoint of biodiversity threats and health risks tied to agricultural pollution, ultimately leading to sharp clashes—like cymbals crashing– among farmers, public authorities, and activists over water scarcity and pesticide dependency. In the background, a crescendo of worries built over atmospheric pollution in dense urban areas, plastics, and chemical contaminants.

Throughout this period, climate change set a recurring motif: the solo introduction of the Kyoto Protocol was followed by the virtuoso performances of the EU ETS, then a staccato note at Copenhagen, a vivace passage at the Paris Agreement, the raucous yellow vests' rock-and-roll intermezzo, and a weary final refrain of green deal fatigue. Simultaneously, energy policy struck its own chord, from the fading chimes of Areva's restructuring and the somber Fukushima dirge to the discordant EPR cost overruns, the shale gas controversies, and the clanking pipes of aging infrastructure. As the diesel engine's sluggish coda wound down, this lengthy composition left its audience—policy experts, stakeholders, and citizens—feeling both fatigued and unsettled, aware that resolving environmental challenges would require new instruments and more harmonious arrangements.

Meanwhile, valuable resources sustained the field's evolution. In France, students and young scholars increasingly questioned overly simplified theoretical frameworks, embraced behavioral and field experimental methods, and raised concerns about equity and justice. FAERE, in turn, provided a meaningful narrative for professional development, emerging as an offshoot of this engaged and forward-looking generation. At the same time, French public administration supported these shifts by fostering institutional consolidation and creating specialized research centers that complemented the pioneering International Center for Research on the Environment and Development, established 50 years ago by Ignacy Sachs and colleagues. Symbolically, this trend was reflected in the decision to add an "e" for "environment" to the acronym of the National Agronomy Research Institute following its merger with a sister institute, acknowledging the field's growing importance.

The road ahead is lined with significant challenges. A turbulent geopolitical landscape threatens the fragile consensus of international climate agreements and, by fostering trade frictions, raises the cost of investing in more sustainable infrastructures. At the same time, there is growing awareness of the intricate interdependencies between human societies

and the environment, reflected in issues such as "cocktail pollution", biodiversity loss, persistent micro-pollutants, and other long-lived contaminants. Pressures—sometimes overt, sometimes quietly building– will continue to emerge from powerful economic interests in agriculture and agro-industry, the chemical and fossil fuel sectors, nuclear energy and mining, water and waste management, urban and real estate development, and the established and emerging industries that supply infrastructure for the energy transition.

Based on its achievements thus far, we can be confident that as FAERE enters its adolescent years, it will continue to shed valuable light on the challenges that lie ahead. It may be tempting to follow the hopeful vision expressed by Heal (2007):

> "[I]f we want a practical vision of a new and more harmonious relationship between humans and nature, we can find it in environmental economics. Just imagine, for a moment, a world in which all of our recommendations are in place. All external effects are internalized. The importance of natural capital and the services it provides are recognized and feature in national income accounts and in public decision-making. The public good nature of many environmental services is acknowledged, and institutions are in place to manage their provision. Adequate weight is given to the interests of future generations through the roles of interest groups and the selection of discount rates. In such a world, there really would be a harmonious interaction between human society and the rest of the natural world. Environmental problems, in the sense in which we in economics think of them, would be solved."
>
> Heal (2007), (p. 23)

Yet, if this idealized scenario still seems chimerical, the question arises: why is it so? While we cannot provide a comprehensive answer, we suggest two points of reflection.

First, it may be that our current analytical toolbox lacks critical tools needed to fully understand public decision-making processes and their underlying objectives. Following in Elinor Ostrom's footsteps, there is much to be gained from examining how values and social norms shape attitudes toward different policy proposals for managing shared resources. Understanding how these values evolve, how opinions shift in response to events or deliberate interventions, and how these perspectives spread through society could offer deeper insights. Further exploration of policymakers' incentives, constraints, and stakeholder interactions, as well as framing analyses in realistic second—or even third or fourth– best scenarios, may prove particularly fruitful.

Second, a related point is that environmental economists must communicate the fundamental trade-offs and mechanisms of their analyses in accessible ways while simultaneously forging lasting collaborative relationships with other disciplines. The intricate interplay between human activity and natural systems calls for greater mutual understanding with researchers in fields such as ecology and health. As technological progress enhances our ability to collect and analyze data, determining which indicators to measure—and for what purpose– will be essential for advancing both theory and practice in environmental and resource economics.

2. INSIGHTS FROM THE SPECIAL ISSUE

The articles in this issue present a representative snapshot of the French environmental economics community, illustrating both its current strengths and its future directions. These contributions, which include both empirical and theoretical work, reflect the range of topics and methods that characterize the field today.

Across several of these studies, two overarching themes emerge. The first concerns how information, perceptions, and preferences shape environmental outcomes. The second focuses on the influence of policy interactions, highlighting the complexity of designing and implementing effective measures. Together, these themes underscore the multi-faceted nature of environmental economics and the need for an integrated approach to research and policy.

2.1. *Information, Perceptions and Preferences*

Chabé-Ferret et al. (2024) investigate an intervention designed to encourage vineyard farmers in Southern France to adopt biological pest control instead of chemical pesticides. Their randomized controlled trial provides social comparison information about neighboring farmers' adoption rates. Unexpectedly, they find that this nudge delays adoption by about two years among informed farmers compared to a control group. The authors attribute this counterintuitive result to the bargaining and rent-sharing context in which farmers operate. When farmers recognize that adopting more sustainable practices generates value to be shared, the informational nudge can trigger strategic behavior—leading to a backfire effect. This study underscores the importance of cautious, small-scale experimentation with nudges in complex settings where stakeholders negotiate the distribution of benefits from environmental innovations.

Gatti and Vauday (2024) analyze a setting where public policies emerge from lobbying and activism by citizens who hold varying degrees of environmental concern. Citizens influence not only policy outcomes but also shape the environmental footprint of their own consumption choices and, through cultural transmission, the preferences of their children. The authors highlight the obstacles to ecological transition, particularly in contexts where materialistic values dominate and environmental policies remain lax. They identify two levers for driving change: first, improving information and education to raise voters' awareness of environmental degradation and health impacts; and second, strengthening socialization and cultural transmission of pro-environmental values from parents to children. These measures can enhance social signaling and encourage more sustainable consumption patterns.

Dubos-Paillard et al. (2024) examine the impact of publicly disclosed flood risk information on real estate prices in a densely populated French area with no recent flood experience. By exploiting variations in the timing of information release and controlling rigorously for potential confounders, they identify a causal link between risk disclosure and property values. Their results show that flats, particularly those located on the ground floor, experience a 3-7% price reduction following the release of flood risk information. This finding highlights the importance of transparent information policies and their power to shape market perceptions of environmental risk.

Mavi and Quérou (2024) investigate common pool resource management under the threat of an irreversible regime shift occurring with a known probability. Such a shift reduces the resource's natural regeneration rate and the marginal value of its use. The authors focus on how equilibrium outcomes and public interventions depend on heterogeneous beliefs among harvesting agents regarding the probability of this shift. While the scientifically estimated probability serves as a benchmark, some agents overestimate it

and others underestimate it. These misperceptions influence equilibrium harvesting strategies, shaping strategic interactions among agents and potentially altering the effectiveness of policy interventions. Interestingly, increased polarization in beliefs need not harm resource conservation. For example, if a substantial portion of the population adopts more cautious harvesting behavior due to higher perceived risks, the resource may ultimately be better protected. This finding underscores the complex interplay between perceptions, strategic decision-making, and environmental policy design.

2.2. *Interactions Between Public Policies*

Leach and Mason (2024) examine how various climate policy designs influence investment in carbon-intensive reserves such as coal, oil, and gas. While emissions pricing reduces both extraction rates and reserves, certain policy features—like output-based allocations of free emission allowances– or expectations of declining abatement costs may unintentionally encourage additional reserve development. This rebound effect suggests that policies promoting technological advances (e.g., carbon capture and sequestration) should be complemented by stricter emissions regulations—such as higher carbon taxes or climate royalties– to ensure that increased efficiency does not inadvertently boost cumulative emissions. Their analysis underscores the importance of recognizing endogenous reserve development as a critical factor in evaluating climate policy effectiveness.

Crommelynck et al. (2024) explore how biodiversity protection policies interact with local economic conditions in France. They examine the spatial allocation of officially protected areas, considering both ecological importance and potential forgone tax revenues for municipalities. Encouragingly, protected areas do align with environmentally sensitive zones. Yet, among sites with similar ecological value, those with lower economic opportunity costs are more likely to be designated for protection. While this pattern could be consistent with implicit cost-benefit reasoning, it also raises concerns about policy design. Local governments, deeply rooted in their communities, weigh the ecological benefits of protection against their own fiscal interests-interests that may not fully account for broader societal gains (i.e., positive spatial externalities). These findings suggest that current institutional arrangements may need rethinking to ensure that conservation efforts are both ecologically effective and socially optimal.

Ecological challenges often transcend national boundaries, highlighting the need for international coordination. Trade agreements can serve as instruments to address these cross-border externalities, but whether their environmental provisions achieve this remains an open question. Nunez Rocha et al. (2024) examine the effects of environmental clauses in such agreements. At first glance, these provisions appear to extend national environmental regulations globally. However, deeper analysis reveals that international negotiations may yield weaker standards due to factors like asymmetric information and lobbying pressures. Using a sectoral gravity model and data from the World Bank's Deep Trade Agreements dataset, the authors find that legally enforceable environmental provisions reduce trade in "dirty-footloose" goods. This effect is particularly pronounced for exports from non-OECD to OECD countries, providing evidence that carefully crafted and enforceable provisions can mitigate the environmental costs of international trade.

Duplan and Chim (2024) explore fisheries management through a novel lens, treating fishing as a stochastic technology akin to filling a fleet's capacity with harvested fish.

Their approach, reminiscent of real options analysis, underscores a previously overlooked factor: the searching opportunity cost of using capacity under uncertainty. Accounting for this cost, they show that it may be possible for the resource stock to remain sustained at equilibrium. While not as explicitly tied to policy interactions as some of the other articles, their findings offer valuable insights for fisheries management. Recognizing the role of search costs and uncertain resource dynamics could help policymakers design more effective measures to balance economic activity with long-term sustainability.

3. CONCLUDING REMARKS

The articles presented in this special issue illustrate the evolving landscape of environmental and resource economics in France. They collectively underscore the importance of understanding how information, perceptions, and preferences shape environmental outcomes, as well as how multiple policy interventions interact to influence resource management, trade patterns, and conservation efforts. These studies show a discipline in motion, responding to complex challenges with innovative methods and broadening its reach through interdisciplinary collaboration and rigorous empirical analysis.

We are grateful to the anonymous referees who devoted their time and expertise to improve the quality of each contribution. Their careful evaluations and constructive suggestions have strengthened both the individual articles and the coherence of this collection. We also thank the authors for their dedication and particularly FAERE honorary member Professor Charles F. Mason for contributing to this issue. The association expresses its gratitude to the editors of this journal for providing a platform to showcase the work emerging from the French environmental economics community. As the field continues to advance, we trust that the insights offered here will inform and inspire future research, policy design, and collective action toward more sustainable outcomes.

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