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(mostly) environmental economics

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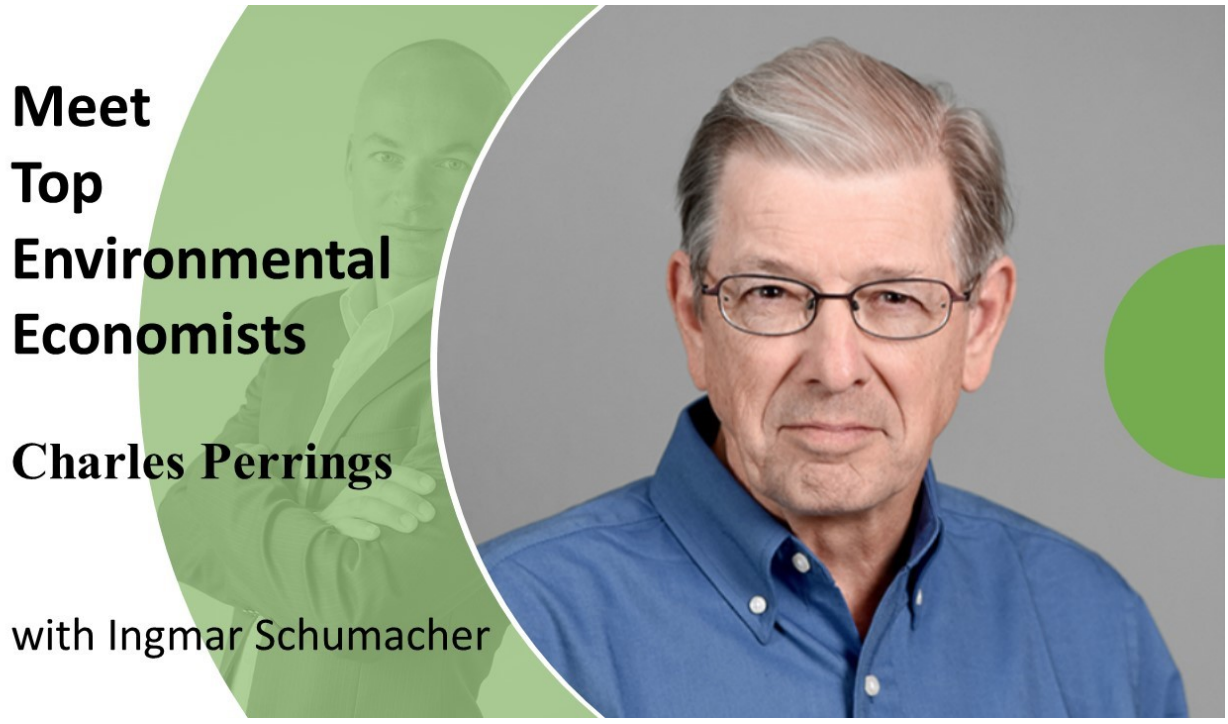
Private: #MeetTopEnvEcon – Charles Perrings



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Charles Perrings

Professor Emeritus at Arizona State University

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It provides me with a great pleasure to have Professor Charles Perrings on my *Meet Top Environmental Economics* series. Charles is Professor Emeritus at Arizona State University in the USA and directs the ecoSERVICES Group. He is a Fellow at the Beijer Institute, Royal Swedish Academy of Sciences, Stockholm, and the Past President of the International Society for Ecological Economics. He was the editor of the journal Environment and Development Economics and has written around 100 articles and 12 books. Charles has advised various national and international organizations, governments as well as research funding agencies.

His writings on nature and biodiversity and his holistic approaches to joining the environment and economics should be on the reading list of every environmental economist. I also enjoyed reading his general articles, such as Hanley, N., & Perrings, C. (2019). The economic value of biodiversity. Annual Review of Resource Economics, 11, 355-375 (PDF); or Perrings, C. (2014) Environment and development economics 20 years on. *Environment and Development Economics*, 19, 333-366 (PDF). There are always interesting and challenging policy lessons. So, please enjoy reading the interview.

Could you please be so kind and give me a brief background of yourself and your main research interests?

I have lived and worked in a number of different places: the National University of Lesotho; the University of Auckland; the University of Botswana; the University of California, Riverside; the University of York; and Arizona State University. Until I moved to York in 1993 my appointments were all in Economics Departments. At the University of York, however, I founded what was originally known as the Department of Environmental Economics and Environmental Management, and at Arizona State University I am in a School of Life Sciences that spans everything from genomics to the history and philosophy of science.

For most of my career, my research has focused on the causes and consequences of anthropogenic environmental change and, specifically, on anthropogenic biodiversity change—change in the richness and abundance of species and other life forms. This is a problem that has many dimensions. The one I have paid most attention to is the introduction, establishment and spread of pests and pathogens, either deliberately or as an incidental effect of trade or travel.

I do have other research interests. Beyond the economics of biodiversity, I have papers in

the economics of labor, economic history, ecology, political science, applied mathematics, and mathematical epidemiology. But these are often subsidiary to my work on biodiversity.

How did you end up as a researcher in environmental economics?

My dissertation was on the development of the copper mining industry in Central Africa. It introduced me to two impacts of economic development that have been recurrent themes in my work since. One was the effect of infrastructural and industrial development on the local environment. The most immediate of these was the impact on tree cover—through the demand for wood both for charcoal used in smelting and timber used for pit props. The other was the effect of the concentration and movement of people on the emergence and spread of infectious disease. The period I studied included the 1918-1919 Spanish Flu pandemic, when mortality rates in mining centers were as high as 20 percent.

Three other things turned out to be important, though. The first was being introduced to Buzz Holling's work in Systems Ecology by one of my PhD students at Auckland, Martin O'Connor. It opened up what became a life-long pattern of collaboration with ecologists. The second was encountering David Pearce in 1981 or 1982 when I was working on *Economy and Environment*. That connected me to the relatively small number of people who were then working in environmental economics and initiated a collaboration with David that ultimately led to my appointment at York. The third was meeting Karl-Gören Mäler and Partha Dasgupta at a Vatican conference in 1987. That was the precursor to my long association with what later became the Beijer Institute of Ecological Economics at the Royal Swedish Academy of Sciences.

What motivates you to do this kind of research?

It just gets more and more important, and more and more interesting. It is hard to think of a set of public good or externality problems that matter more than the environmental consequences of the closer integration of the global economic system. It is also hard to think of problems that are as rich.

Which of your academic (or policy) contributions are you most proud of?

I'm not particularly proud of any of my scientific contributions. My first reaction on re-reading any of my past papers is to think of all the ways in which it could have been better, so 'proud' isn't quite the right word. Will any of my scientific contributions stand the test of time? I don't know. I do have some papers from the 1980s and 1990s on resilience and sustainability that are still regularly cited, but not at the level one gets with multi-authored synthesis papers or assessments. It would be interesting to see if they are still being cited in another thirty years, but I doubt that I'll be around to check.

In other areas, I have graduated a number of students over the years, many of whom have gone on to do some nice work. I guess I'm proud of them, especially those coming out of developing countries. The department I founded at the University of York, now known as the Department of Environment and Geography, has developed into a fine cross-disciplinary unit. I'm also pleased about that. Finally, the years I spent with Diversitas culmninated in a five-year push to develop the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). I'm glad that the effort succeeded, and that IPBES is now providing policy makers with the best available data on the causes and consequences of biodiversity change.

If you were to give a list of articles that a young researcher in your line of research should read, what would it be and why?

I think I would focus on foundational pieces rather than recent articles. Most graduate programs tend to focus on current literature to the exclusion of foundations, and I think that is a pity. Those who know me will not be surprised that at the top of my list of foundational pieces would be two papers by Harold Hotelling:

Hotelling, H. 1931. The economics of exhaustible resources. Journal of Political Economy **39**:137-175. Hotelling, H. 1929. Stability in competition. The Economic Journal **39**:41–57.

A 1981 paper by Deverajan and Fisher,

Deverajan, S., and A. Fisher. 1981. Hotelling's "Economics of Exhaustible Resources" Fifty Years Later. Journal of Economic Literature **XIX**:65-73,

described Hotelling's 1931 paper as almost the sole source for the field of natural resource economics. It turns out that his 1929 paper was also the source for the canonical median voter model that still holds sway in political science. Hotelling's papers are not particularly accessible, but my latest book,

Perrings, C., and A. Kinzig. 2021. Conservation: Economics, Science, and Policy. Oxford University Press, Oxford,

develops a general theory of conservation that shows how the Hotelling model applies to assets of any kind.

Beyond the Hotelling papers I would list two books:

Clark, C. W. 1976. Mathematical Bioeconomics: the Optimal Management of Renewable Resources. John Wiley, New York, NY.

Mäler, K.-G. 1974. Environmental Economics: A Theoretical Inquiry. Johns Hopkins Press, Baltimore.

Both extend Hotelling. The first is the source of the dynamical models that are at the core of all subsequent work on renewable natural resources (Dasgupta and Heal's 1979 book plays a similar role), and the second provides the key connection between the use people make of natural resources and their valuation.

Finally, I would list two papers by natural scientists:

Holling, C. S. 1973. Resilience and stability of ecological systems. Annual Review Ecology and Systematics **4**:1-23.

Holdren, J. P., and P. R. Ehrlich. 1974. Human population and the global environment. American Scientist **62**:282-292.

The Holling paper explores the stability of equilibrium in ecosystems. What makes it so seminal is his focus on the size of perturbations needed to dislodge the system from its current basin of attraction—still the best measure of resilience. The Holdren and Ehrlich paper is the earliest contribution to the modern concept of ecosystem services.

What advice would you give to young students who want to work in your field (ecosystemservices, the economics of epidemiology, biodiversity)?

This is a very difficult question to answer. Anyone wondering about the wisdom of working within or across disciplines knows that there are cogent arguments in both directions. Those who elect to work within a single discipline believe it allows them to explore the problems posed by that discipline in depth, and that those are the problems that matter. Those who elect to work across disciplines believe the problems that matter are beyond the reach of any one discipline, or the parallel efforts of different disciplines. Such problems are inherently interdisciplinary, benefiting from the skills of people working in different disciplines but depending on feedbacks between disciplines. The problems I work in tend to be of this kind.

If we think about the choices younger people have to make, there is another complication. The path to tenure begins with the choice of PhD topic and advisor (and so university), and includes post-PhD appointments and publications. There is no question that a disciplinary approach provides a safer and more secure path to tenure than an interdisciplinary approach. The usual advice would therefore be to hold any interdisciplinary aspirations you might have until you have tenure, and that is still the advice I give to most young people. There are, however, some who are constitutionally incapable of staying within the bounds of a single discipline, and who have the motivation and capacity to master the techniques of more than one discipline. To those I say 'go for it', but do so with your eyes open.

Let's think about policy makers. Policy makers don't necessarily have the same technical backgrounds that researchers have. Which book or reference would you suggest a policy maker should read, if they wanted to know about research in your field?

There are policy makers and policy makers. Some have as little difficulty reading the journals as you and I. Others have neither the time nor the aptitude to do so. In this case, books are unlikely to be very helpful. The primary sources of information for such people are summary papers in journals such as *Nature* and *Science*, the executive summaries in assessments such as the Millennium Assessment, the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services, The Lancet commissions and the Dasgupta Review, or working briefs from staff responsible for bringing their attention to new results in the sciences.

Having said all that, I think that the *Annual Review of Environment and Resources* contains summary reviews that are accessible enough to be very helpful to someone trying to get a feel for the literature in the field.

What future direction would you envision for your field of research? And in particular, what kind of obstacles would you see there?

What I would like to see happen (no guarantee that it will) is a progressively deeper understanding of the many ways in which closer integration of the global system affects its evolution over time, where the term 'global' encompasses both the bio-physical and socio-economic components of the system. This is a big ask, though. COVID-19, for example, is currently showing just how complicated the spatial and temporal epidemiological, economic, political, and cultural feedbacks affecting the course of the pandemic can be. Yet for all the reasons I have already mentioned, few of the brightest and best minds around have any incentive to tackle more than a small piece of the puzzle.

You have written extensively on biodiversity. What is your position on the Dasgupta Review?

I read and commented on every chapter as it was written and so watched it evolve into the final product. I've described it as a 'must read' for those interested in understanding the intersection between biodiversity and economics for a couple of reasons. One stems from the fact that, as one would expect from Partha Dasgupta, there is an underlying view—a model—of the way that biodiversity and economic growth are connected. The model is used to draw conclusions about the economic consequences of biodiversity loss, and to provide an interpretation of current patterns of biodiversity loss. So it offers a theoretically consistent treatment of why biodiversity loss might matter for the economy. The second is that it is also an assessment of an aspect of the problem that doesn't usually attract much attention. Dasgupta was supported by a team of people who were charged with summarizing available information not just on the patterns of biodiversity loss but also on the development of national biodiversity institutions, instruments, and policy.

Of course it doesn't cover all dimensions of the problem. It couldn't. We are as much challenged by the growth and spread of pests and pathogens as we are supported by the cultivation of beneficial plants, animals, and microbes, and that side of the story gets less coverage. But the Review is still a tour de force.

What do you view as the main contributions of economics to solve problems related tobiodiversity?

Biodiversity change is fundamentally an economic problem. By this I mean that its causes lie in economic decisions that take only partial account of impacts on species richness and abundance, and its consequences can be measured in terms of changes in welfare. More particularly, its causes lie in the incentives people have in a world where property rights are far from complete; where governments subsidize the overutilization of natural resources, and discourage the conservation of species and their interactions on private lands; where externalities of trade are largely ignored, and where public lands and sea areas are systematically plundered by private interests.

The solution to all of these sources of biodiversity change is necessarily economic. The establishment of protected areas or protective legislation, the assignment of property rights, and the development of institutions of governance at local, national, and international levels, are aimed at changing incentives just as much as the introduction of taxes, access fees, user charges and so on. To confront users with the social opportunity cost of actions that deplete biodiversity, or to calculate the value of actions that conserve biodiversity, one needs to understand their marginal impact on wellbeing. In a nutshell, there is no solution to any serious biodiversity problem that does not rest on economic foundations.

Imagine you were the president of the USA. What would your environmental policy look like?

This is too big a question. But if there was only one thing I could do it would be to initiate development of an integrated approach to the international governance of the biosphere. At the moment we have hundreds of bilateral or multilateral agreements impacting biodiversity and its role in biophysical processes that span national jurisdictions. We also have dozens of intergovernmental institutions responsible for individual pieces of the puzzle, none of which have a strong incentive to coordinate or cooperate with others. This is partly due to the reluctance of nation states to do anything that might cede sovereignty—a comment that applies to the USA as much or more than it does to any other nation state. I would start to roll that back, and start to build the capacity both to analyze international environmental problems at the right level, and to take collective international action at that level.

You have written quite a few books. Do you think they influenced your career? Do you feel they were worth investing the time (in contrast to e.g. writing articles)?

By most standard measures, writing books doesn't pay. They don't count for more than articles, and they tend to be cited less frequently. Whether you are writing a 1000 word commentary for a journal or a 100000 word book, you still add only one line in a CV. More than this, many disciplines, economics included, regard articles more highly than books. So why do it? The answer is that it offers the space to develop ideas in ways that are just not possible in journal articles. My new book, written with Ann Kinzig and referred to earlier, develops a general theory of conservation that is then applied to several different dimensions of the biodiversity problem. In principle we could have done the same thing in a dozen or more articles, but each would have been disconnected from the rest, and so would have to replicate much of the common ground. Nor could we have built the argument in the same way, step by step.

Of course it helps not to have to worry about building the CV. Books, like interdisciplinary research projects, have fewer downsides the closer you get to retirement.

Economists, especially environmental economists, very often just do not get enough say when it comes to setting the policy agenda. How can we increase our say?

I am not sure that we should have a role in setting the policy agenda. Whether policy concerns the conservation of natural resources in the public domain, the internalization of environmental externalities, or the supply and funding of environmental public goods, the role of environmental economists is to identify the discounted net social benefits of various options. The decision as to whether to put those options on the table in the first place should lie with people who have been elected to office. Economists can certainly point to the social costs of doing nothing, but I don't see that they should have a role in drawing up the agenda.

I do think we should have more of a role in identifying the costs and benefits of alternative policies. However, this might simply argue for a change in the formal requirements for project or program appraisal, and through this for a change in the numbers of environmental economists in agencies responsible for evaluating and implementing policy.

Let's go to a different topic. Do you know the concept of holidays? Or do you take your papers to the beach?

I know the concept well. Ann and I regularly go camping and hiking in wilderness areas. I admit that I was once guilty of taking a book on differential topology on holiday to French Polynesia, but my recollection is that my reading didn't last beyond the first Tahitian vanilla punch. Since I went emeritus this year, I expect to have even more time to relax in the future.

What is your favourite economics joke or anecdote from a conference?

For a long time there was a picture on the walls of the Beijer Institute in the Royal Swedish Academy of Sciences. It may still be there for all I know. It was titled 'Two roads to the Volvo Prize*'. The picture shows two people. One is Partha Dasgupta, deeply serious, and turning the pages of a scientific paper. The other is Karl-Gören Mäler, equally serious, but pouring a glass of wine. My kind of science.

*Dasgupta and Mäler were awarded the Volvo Environment Prize in 2002.

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