Question 3: There is ongoing concern about the extent to which research in environment and development economics makes an impact on real world decisions. What do you see as some ways of maximizing the impact of environment and development economics research on policy decisions?

Mission started – but far from accomplished

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We live at a unique moment in history when rapid economic growth has finally lifted hundreds of millions out of deep poverty, not only in Asia and Latin America but increasingly in Africa (Sala-i-Martin and Pinkovskiy, 2010). Yet the impending damage of climate change could reverse this. The world is failing miserably at implementing rational and collectively beneficial treaties and policies to tackle climate change. In spite of the many declarations concerning the need not to exceed two degrees of warming, current lack of action will make it difficult to avoid three degrees. The effects of climate change will be very unequal, particularly because there is a negative relationship between temperature and income (Dell *et al.*, 2009). The poor will have particular difficulty in making the necessary investments to protect themselves and to adapt in response to climate change pressures, rendering them most vulnerable. New evidence shows that even the vital ability to grow economically will be severely set back. Several articles have shown how heat – particularly in poor countries – may increase conflicts and decrease growth rates. Climate change is far from the only global environmental problem we face; we find in one area after another that world production and consumption exceeds the Earth's capacity to provide a satisfying quality of life, which raises a number of sustainability issues (see, for instance, Arrow *et al.*, 2012).

The threats to our ecosystems make some people doubt whether we can have any economic growth at all and also question economics as a science. I believe instead that environmental economics does have useful

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answers to how economic policy should be designed in order to restrict environmental degradation, pollution levels and the exhaustion of natural resources – issues that particularly affect developing countries. A fundamental message is that we do *not* need to stop growth or the aspirations of the poor. We can combine economic growth with various kinds of ecosystem limits. In fact optimizing with restrictions is the very core of economics. We can provide a decent life for a large population – we can have increased wellbeing – but at the same time we cannot have continued growth in carbon emissions or in other activities that deplete or destroy the ecosystems on which we depend. The restrictions imposed by nature will mean that economic policy has to be changed and in some cases very strong instruments will be needed.

To take but one example, economics teaches us that property rights are important. We have to worry more about the depletion of those resources that have no ownership control like the atmosphere, genetic information or the open seas than depletion of traditional 'depletable' minerals that often come from mines that do have owners. Very strong policies are needed to protect vital ecosystem resources when no owner does so. When policies are insufficient it is often because economic interests are too powerful. Maybe classical environmental economics has been moulded too heavily in the context of rich democracies. When we turn to low-income countries, we often need to remind ourselves that policies are not necessarily shaped by what would be best for overall welfare according to an abstract 'planner' – but by the narrow interests of the powerful. Game theory, behavioural economics and asymmetric information may be more useful than the simple microeconomics of standard markets. For environmental economics to really have an impact in solving global issues, we need to probe deeper with new methods and understand, for instance, the behaviour of nascent markets, the politics of decision making in very unequal societies where political economy and distributional concerns are paramount.

The instruments that environmental economics suggests for dealing with climate change, from taxes to permit trade, reducing emissions from deforestation and forest degradation (REDD) and the Clean Development Mechanism (CDM) are all appropriate, but will they be used as intended? Clearly the world would benefit tremendously from a global public good if climate change could be mitigated through global cooperation – but will the rich and powerful countries agree to workable climate treaties that are sufficiently fair to the poor to be acceptable? CDM projects have in the main gone to large and well-organized countries such as China, with few going to Africa where, one could argue, they are most needed. In part this is due to a striking lack of capacity in environmental economics. As a community of scientists and teachers we surely have a responsibility to contribute to research that will guide policy makers in developing countries on these issues. We must step up our efforts in teaching and capacity building in environmental economics! It is scandalous that low-income countries lack the capacity to adequately defend themselves in international negotiations on the global commons.

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It is already 20 years since authors like Partha Dasgupta highlighted how little attention development economics pays to environmental issues, while environmental economics is largely focused on OECD country problems and focuses very little on developing country problems. This was the background to a number of actions such as the initiation of several capacity-building initiatives such as the Environment for Development Initiative (EfD), and regional networks such as CEEPA, LACEEP, SANDEE and EEPSEA. It also led to the founding of this journal, *EDE* – well established, well ranked – and fun to read! Young economists from low- and middle-income countries have moved back home with a PhD in environmental economics and they have done good work: consulting for their governments; producing high-level research; teaching; building up research and policy organizations; and developing masters and PhD programs. Yet this is still a trickle. For environmental economics to really have an impact in solving global issues, we need not only more research but also to redouble our efforts at capacity building.

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Contribution of development and environmental economics to national policy and development: the case of China

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Introduction

Development and environmental policies have accompanied China's economic growth progress, and played significant roles in the process. The economic field in China has experienced its own growth and transition process. Over more than three decades of economic reform and transition, Chinese economists have learnt from the West, from similar countries undergoing economic reform and transition and, more importantly,

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