



Obituary: Karl-Göran Mäler

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On 20 May 2020, we lost a friend and a colleague. Karl-Göran Mäler was the founding father of environmental economics in Europe and a leader in the field. *Environmental Economics: A Theoretical Inquiry*, which he wrote in 1971 while he was a visiting scholar at Resources for the Future in Washington DC and which was published in 1974 by The Johns Hopkins University Press, provided a comprehensive description of the state-of-the-art of the field. According to a review in the *Journal of Economic Literature*, it was, up to that point, “the most complete and carefully structured [book] connecting macroeconomic concepts with materials balance ... a remarkable book, both in rigor of analytical thought and clarity of presentation.” It became an important reference for this new field. It also reflected his strong conviction that a solid theoretical basis is a requirement for research, which does not mean that he ignored empirics and policy. As Karl-Göran pointed out in the beginning of the book, among the reasons for writing the book was his interest in the environment and the problems connected with environmental quality, and his interest in abstract theory and its application to practical problems. These interests stayed with him throughout his career.

Karl-Göran Mäler was born on 3 March 1939 in a village in the north of Sweden. He studied at the University of Stockholm, with visits to MIT and Stanford University, and finished his doctorate in 1973. He started in 1969 as an assistant professor at the Stockholm School of Economics, where he became a full professor of economics in 1975. This was typical for that time: broad and deep studies and when you proved to be good, a fast career.

Karl-Göran was elected as a member of the Royal Swedish Academy of Sciences in 1981 and served as a member of the Committee on the Prize in Economic Sciences in Memory of Alfred Nobel from 1981 to 1994. He was the head of the committee between

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1986 and 1987. From 1991 until his retirement in 2006, Karl-Göran was the director of the Beijer Institute of Ecological Economics at the Royal Swedish Academy of Sciences, which he transformed into a worldwide renowned institute, together with Sir Partha Dasgupta—another pioneer in the field, and a close friend and collaborator—as the chair of the Board from 1991 to 1996.

In academia, we tend to assess colleagues mainly by the quality of their research, but for Karl-Göran, his research contributions are just a part of the story. His role as a visionary, a mentor and a capacity builder are, as they say, “the rest of the story”.

1 The Beijer Institute

Among the objectives of the Beijer Institute is to find ways by which ecologists and economists can productively cooperate on issues relevant to the human–environment. Before 1990, there was open hostility between groups of ecologists and groups of economists. As Director of the Beijer, Karl-Göran brought together top economists, like Kenneth Arrow, Robert Solow, Partha Dasgupta and William Brock, and top ecologists, like Paul Ehrlich, Buzz Holling, Simon Levin, Brian Walker and Stephen Carpenter. They interacted with younger ecologists and economists and, in that way, the attitudes changed, and fruitful and productive cooperation was developed. In the Director’s Column of the Beijer Annual Report during his last year as Director, Karl-Göran pointed out that: “We are now willing to listen to each other, to understand each other, and to work with each other. That, I believe, is the greatest achievement we have made during these 15 years.” Those of us who had the privilege of being part of this group learned and matured scientifically through this change in attitude.

A vital part of this process was the famous Askö meetings which started in 1993 and continue to the present, in which economists and ecologists sitting at a round table in a research station on the small island of Askö vigorously exchange ideas. The resulting Askö papers, which were published in journals such as *Science*, *PNAS*, *Nature Climate Change* or the *Journal of Economic Perspectives*, provide an indication of the level of scientific quality attained through these collaborations. The dinners in the small dining room of the facility and jumping into the cold Baltic Sea after a sauna which had no shower—for those who survived it—provided a level of human interaction that cemented long-term friendships.

2 The Developing World

Karl-Göran Mäler had a deep commitment to the developing countries. He, together with Partha Dasgupta, created a large program of teaching and research workshops—the “Program of Teaching and Research in Developing Countries”—in order to inform university teachers of economics in the different regions of the developing world about ecological economics. As Partha Dasgupta explained in “Shifting requirements for knowledge to advance a sustainable South” in 1998, the ideas behind this capacity-building program were simple but effective, and gave an enormous boost to researchers in the developing countries. At the teaching workshops, the best lecturers brought them up-to-date. At the research workshops, the researchers presented their own work and got feedback from experienced researchers from the developed world. This was a

process in three stages. In the first stage, they presented a research plan, in the second stage a draft paper, and in the third stage a completed paper, with the purpose of being ready to submit to an international journal.

All the participants in the teaching and research networks became members of a regional network, such as SANDEE for South Asia, RANESA for Eastern and Southern Africa (turned into CEEPA for Africa) and LACEEP for Latin America and the Caribbean. At some point, the networks matured and organized the activities themselves. This is an outstanding example of how development should take place. To use Karl-Göran's own words from the Beijer Annual Report in 2002, "There is possibly nothing compared with being together with a group of young, extremely enthusiastic, talented, and energetic scholars, discussing serious issues on the application of economics to the analysis of natural systems. If there is any accomplishment I really feel proud of it is the creation of the capacity building program the Beijer Institute has been involved in and the subsequent networks we have been involved in creating!"

The commitment of Karl-Göran Mäler to the developing world and the environment is further exemplified by the fact that he, along with Partha Dasgupta and Charles Perrings, and in collaboration with Cambridge University Press, started a new journal which is positioned at the intersection of environmental, resource and development economics with the aim of encouraging relevant submissions from researchers in both developing and developed countries. This journal, *Environment and Development Economics*, has become a well-respected journal with a 25-year history and current annual submissions of more than 350 papers.

3 Europe

Karl-Göran Mäler was also instrumental in promoting cooperation and collaboration of environmental and resource economists in Europe. He played an important role in the establishment of the *European Association of Environmental and Resource Economists* (EAERE). He was there when the idea was born in 1987 at a conference at the Wagneningen University. He was one of the founding members of the EAERE and he was a plenary speaker at the First Annual Conference in Venice in 1990. He addressed the EAERE conference again in 2000, with a keynote speech on "Social well-being, wealth and accounting prices". He was elected as a member of the first EAERE Council in 1991, and he was a lecturer in the first EAERE Autumn School in 1991. He wrote the very first paper published in the EAERE journal *Environmental and Resource Economics* in 1991. In 2005, Karl-Göran received the EAERE European Lifetime Achievement Award for all his contributions to the field and to the association. In 2019 Karl-Göran was appointed an EAERE Fellow.

Another important endeavor in cooperation—in this case involving multidisciplinary cooperation—was the research program between the Abdus Salam International Center for Theoretical Physics (ICTP) in Trieste, the Fondazione Eni Enrico Mattei (FEEM) in Venice, and the Beijer Institute. In the early 2000s, this ambitious research program which focused on the economics of complex dynamic ecological systems and spatial dynamics was initiated. This research program produced valuable research—and multidisciplinary collaboration—and provided the seeds for ongoing research that is still being produced.

4 Research

In terms of research, certain topics were especially close to Karl-Göran's heart, and for these topics he developed the seminal papers. One is the topic of national accounting. He wrote "National accounts and environmental resources", the first paper in *Environment and Resource Economics* on this topic. Many papers followed, often written together with Partha Dasgupta—for example, "Net national product, wealth, and social well-being" in *Environment and Development Economics* in 2000—which brought forward the novel idea that inclusive wealth can be used as an indicator of sustainable development.

A second topic is the acid rain game. He published the seminal paper, "The acid rain game", in a collection of papers from the conference where the idea for an association of environmental and resource economists was also conceived. His economic analysis of the acid rain problem in Europe, based on solid game theory and the empirical information on the trans-border depositions of sulfur and nitrogen oxides, is a masterpiece. Later he and Aart de Zeeuw extended this work—in "The acid rain differential game"—to a dynamical game analysis, including the concept of *critical loads* that Karl-Göran had learned from his ecological colleagues.

A third topic is management of the lake, an example of an ecological system with a *tip-ping point*. We were very fortunate to participate in a meeting on the island of Gozo where our ecological colleagues presented this model, and to work together with Karl-Göran on the economic analysis of the lake, leading to "The economics of shallow lakes" in 2003 and "Feedback Nash equilibria for non-linear differential games in pollution control" 5 years later. These are examples of how he managed to achieve a real crossover between economics and ecology.

In 2002, Karl-Göran Mäler, together with Sir Partha Dasgupta, received the Volvo Environment Prize for their work in environmental economics. This prestigious prize was awarded in recognition of their work on a new welfare index which showed that some of the poorest countries of the world had "developed" by degrading their natural environment. Although these countries appeared to be performing well in terms of GNP or HDI, the new welfare index suggested by Dasgupta and Mäler included not only the social value of manufactured capital, but also human and natural capital. As such, it offered new insights into the development process, and the efforts to find sustainable solutions to the problems of poor countries.

In the Beijer Annual Report for his final year as Director, Karl-Göran mentioned "three items I have personally been very involved in and which I have found of extreme intellectual interest and importance. These are: capacity building in developing countries, resilience in ecological, economic, and social systems, and indicators of sustainable development". His achievements in these three areas inspired many of his contemporary researchers, whose work in turn inspired a new generation of researchers ... and the process continues.

5 Working with Karl-Göran

For Karl-Göran, work and a relaxed and pleasant environment which promoted friendship and mutual trust went together. A bottle of white wine could be found in the refrigerator of the Beijer Institute to celebrate a long day of hard work or a breakthrough in the research. Furthermore, Karl-Göran believed that creating an atmosphere in which people

felt comfortable was productive, and he was right. The main idea of analyzing the lake problem as a nonlinear, non-convex differential game originated in a tent in Zimbabwe during one of the capacity-building workshops. Hard work, good food, an interesting environment and friendship go together. At the same time, he challenged people with the purpose of stimulating them to get the best out of themselves. He had high standards. The process could be difficult, but the results were rewarding. Karl-Göran Mäler has had an enormous influence on the research agenda and the lives of many people all over the world.

6 Epilogue

We have lost a dear friend and a great colleague. We will miss the time together, the discussions, his humor and his kindness. The metaphor “standing on the shoulders of giants” applies. He was the giant, and we were standing on his shoulders. The field of environmental economics, especially in Europe and in the developing regions, is enormously grateful for what he has accomplished. Our condolences go to his wife Sara Aniyar—they met at one of the LACEEP workshops—and to his daughters Lena and Kicky and the other members of his family. Our memories of him will continue to be a source of inspiration. From all of us the world over who were fortunate enough to know and work with him, a heartfelt thank you, Karl-Göran!

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