

Elinor Ostrom (1933–2012)

Elinor Ostrom, the only woman to receive a Nobel Prize in Economics (in 2009), passed away on 12 June 2012, after a short and intense battle with prostate cancer. Her research challenged the accepted theory of the ‘Tragedy of the Commons’, most famously articulated by Garret Hardin¹. The theory stated that commonly used natural resources are always over harvested by local residents, each seeking to selfishly maximize his or her profit. This trajectory of unsustainable use followed by collapse was believed to be inevitable, unless conservation is mandated by a strong government or private agency with conservation interests. In contrast to this rather gloomy view of human interest in conservation and abilities to self-regulate, research by Ostrom and her colleagues has demonstrated the existence of communities across the world which engaged in communication and deliberations to develop a fascinating variety of adaptive rules to conserve their environment², ensuring a sustainable harvest of natural resources.

Based on a study of local institutions that had successfully persisted for over a hundred years from countries as varied as Japan, Switzerland, Spain and the Philippines, and from diverse resource systems including grazing lands, forests and irrigation systems, Ostrom assessed the conditions that shaped how ‘a community of citizens – can organize themselves to solve the problems of institutional supply, commitment and monitoring’³. This study resulted in her articulation of a set of eight Design Principles, conditions that facilitate the sustained commitment of individuals in the group to cooperate, follow rules and limit levels of harvest to ensure long-term sustainability. The principles are fairly simple, yet profound. For instance, one design principle – often ignored by policymakers – states that people are much more likely to follow a set of rules if they have had some say in formulating them, whereas they are much more resistant to the same set of rules if they are handed down by a higher authority (such as a government organization) and asked to follow them without question. This is a very simple, yet essential part of human psychology – we do not like to

follow other people’s rules, even if we acknowledge that they may be good for us! Thus, this principle alone makes it quite clear that even the most well-meaning efforts towards ‘participatory’ governance by outside conservation agencies or the government are unlikely to succeed unless people have a say in how to manage their own resources.



Another very simple yet important Design Principle states that monitoring, to find out when people break rules – and sanctioning, especially of especially important repeat offenders – is very important for these groups to be successful in the long term⁴. If this does not take place, and one selfish individual starts to exploit the system, other people often start to follow. As she succinctly put it, human beings don’t like to be suckers! Thus, one rule breaker can cause an entire system to break down rather quickly. Yet, as another principle makes it clear, mechanisms for conflict resolution need to be low cost – for instance, in the Indian context, many challenges to the system are more easily dealt with at a local scale, although some, such as armed poaching, require interventions by the government.

These Design Principles, and the fundamental ideas behind them, are very eloquently and expressively summarized in a short lecture she gave at the Stockholm Resilience Centre, which can be viewed at <http://www.youtube.com/watch?v=ByXM47Ri1Kc>. Although ini-

tially based on an in-depth study of a fairly limited set of cases, they have been extremely influential since their famous exposition in a classic 1990 text, ‘Governing the Commons: The Evolution of Institutions for Collective Action’³, and have been validated by scholars in diverse ecological, geographic and cultural contexts⁵.

Elinor Ostrom – known as Lin to her colleagues and friends – was born in 1933 in Los Angeles, and grew up during an era impacted by economic depression and global war⁶. She had first-hand experience of the scarcity of important natural resources such as water and food, and consequently developed a strong belief in the importance of frugality, and in the capacity of humankind to cooperate and provide a helping hand to others. Although no one in her immediate family had ever gone beyond a high school degree, Lin completed an undergraduate degree in Political Sciences at the University of California at Los Angeles in 1954, completing a normally four-year programme in three years, and graduating with honours, all this while financially supporting herself with a variety of jobs⁷. Undeniably bright, and with a strong interest in understanding politics and economics, she nevertheless faced severe challenges as a young woman interested in graduate research that may well have deterred people less purposeful than she was. Lin had been discouraged from taking mathematics classes as part of her undergraduate programme, and found it very difficult to enrol for a PhD at the University of California Los Angeles. Eventually, she did become one of four women enrolled for a PhD for the first time ever in University of California at Los Angeles (UCLA)’s Political Science programme, but only against stiff opposition by many of the faculty members. Her PhD thesis focused on water management in southern California, where she gained first hand empirical evidence on the importance of water associations in dealing with complex challenges of water scarcity. It was at this point that she met Vincent Ostrom, an eminent political scientist at UCLA who became her closest colleague and husband, and who passed away shortly after her at the age of 93.

In 1965, Vincent and Lin moved to Indiana University in Bloomington, where Vincent had been offered a faculty position. Even here, Lin faced challenges of securing an academic position, and was only initially offered a job to teach early morning graduate classes, not typically desired by either students or faculty⁸. In the early years of her appointment at Indiana, she conducted very insightful research into the challenges of metropolitan governance in the US. This research demonstrated that polycentric governance systems – where multiple small, medium and large units looked after different aspects of function – were generally superior to single, massive administrative structures that ended up being disconnected from local neighbourhoods^{8,9}. During this time, Lin expanded on her integrative approach of research, combining extensive field visits and in-depth examination of administrative records, with laboratory experiments under controlled conditions, using these to feed the development of rigorous theoretical frameworks and models. After 15 years of research into urban governance, she then returned to her studies of the commons, developing a global database on enduring common property institutions that ultimately gave rise to the research for which she received the 2009 Economics Nobel, as well as a plethora of other awards and recognition – including, most recently, incorporation in the *Time* magazine's 2012 list of the 100 most influential people in the world.

Although Lin deeply believed in the local, her ideas, impact and influence were truly global. She worked with colleagues and students from all continents, and had personally conducted field work in countries as diverse as Kenya, Nepal and the USA. She advised a staggering number of PhD students, with 142 at last count – and literally scores of other young scholars whom she mentored informally. In recent years, she worked especially hard on developing an exhaustive, diagnostic framework for the study of linked social-ecological systems such as human-managed irrigation systems, grazing lands, forests and fisheries^{10,11},

which will undoubtedly and significantly shape future research into problems of conservation and environmental change. Blessed with incredible spirit, enthusiasm and energy, she continued to work tirelessly on fresh ideas and problems even after being diagnosed with pancreatic cancer in October 2011, travelling to countries as far flung as India, UK and Mexico, and conducting research from her hospital bed until the very end.

Lin was especially interested in issues of conservation in South Asia. She had conducted extensive research on irrigation and forests in Nepal for decades and had a great attachment for the country, its culture and its people. She was also deeply interested in issues of forest conservation in India⁴. I had the privilege of working with Lin since 2000, at the Centre for the Study of Institutions, Population, and Environmental Change (CIPEC), a unique interdisciplinary centre for research on forest change that she and her colleagues established at Indiana University. We had recently initiated a programme of research examining urban collective action in the context of lake restoration in Bangalore that she was very interested in following, and compared with urban contexts in the US and elsewhere. During her last trip to India and Bangalore in February 2012, she visited several of the lakes – and planted a jackfruit tree at a community-restored lake, a small patch of green which now flourishes in Bangalore in her memory.

As inspiring a person as she was a scientist and visionary, Lin Ostrom touched the hearts and minds of everyone she knew. Her ideas had an even larger footprint. Talking about the recent discussions at the UN's Rio +20 summit, she strongly highlighted the fact that we should not depend only on the success or failure of international governments to reach an agreement, but also focus on developing a diversity of solutions to mitigate and adapt to climate change, at multiple levels – with local communities playing a very critical role^{12,13}. Although this intellectual giant is no more, the ideas, frameworks, theories, datasets and (perhaps most important) the social

and intellectual networks she has helped to shape – hold great significance for humankind, as we enter the era of the Anthropocene¹⁴.

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HARINI NAGENDRA

*DST Ramanujan Fellow,
Ashoka Trust for Research in Ecology
and the Environment (ATREE),
Royal Enclave,
Srirampura, Jakkur Post,
Bangalore 560 064, India and
Centre for the Study of Institutions,
Population, and Environmental
Change (CIPEC),
Indiana University,
Bloomington IN 47408, USA
e-mail: nagendra@atree.org*