

What is an ecologist doing talking about solar radiation management?—the role of ecology in solving environmental challenges

Steven Peter Hamburg

Environmental Defense Fund

With the dramatic increase in world population and the development of new technologies that provide so many benefits to humanity we are faced by unprecedented changes in ecological systems. A hundred years ago ecologists were focused on describing how nature in the less disturbed portions of the earth, of which there were many, worked. Fifty years ago there was a growing awareness that human impacts on ecological systems were important – but were largely outside the sphere of what ecologists concerned themselves with. Twenty-five years ago the role of human-environment interactions were of concern to more ecologists, but it was still largely in the context of how to describe the structure and function of the less disturbed ecosystems of the world. If ecology and ecologists are going to be relevant in addressing the needs of a planet undergoing unprecedented changes given that humanity is uncertain of the affects of its actions, we need to redefine our focus. Ecologists are trained to understand systems and the interactions among the component parts, we need to recognize that in almost all ecosystems humans are key components of the system and that ecologists need to be social scientists as well as natural scientists if we are going to be useful and not merely an artifact of the 20th century. The key ecological questions of today are messy and largely not amenable to experimentation, we need to go back to our intellectual roots in using more descriptive approaches combined with experiments where they can help address relevant questions. Ecologists need to get involved in helping other scientists and society more broadly address the pressing questions of our time: climate change, freshwater demand, alteration of biogeochemical cycles, introduction of exotic species, the need to feed 10 billion people by the end of the 21st century. Taiwan is a microcosm of the challenges facing humanity: you have high population density and yet some of the least disturbed ecosystems in the world. You need to work harder at understanding the human ecosystems on which you personally depend and more importantly how the diverse ecosystems on the island interact.