

Ships passing in the night: Difficulties in inter-disciplinary engagement in relation to issues of “Population and Environment in Australia”

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The discussion of population and environment issues in Australia lacks integration and coherence. There has been a longstanding difficulty in achieving constructive engagement between the various key disciplines. Their discourses rarely mesh. In particular, few disciplines have yet recognized, and internalized, the relevance of the idea of environmental limits to their central intellectual discourse.

It is now clear that the discussion of “population and environment” in Australia can no longer ignore the fundamentals of “sustainability”. The world-wide (including Australian) evidence that the human enterprise is increasingly overloading the capacity of the natural world to supply, replenish and absorb brings a new dimension to this discussion. Henceforth, the discussion about sustainable management of population and environment must refer to the indefinite, or at least very long-term, human carrying capacity of the Australian environment. This topic is compounded by the fact that the discussion about carrying capacity can be conducted at two levels – first, in terms of Australian self-sufficiency within an international trading framework; and, second, in terms of Australia’s accepting a fair share of the world’s total burden of human needs.

This problem of disciplinary separateness, of non-engagement, is, of course, a more general problem. It is not confined to discussion of these particular Australian issues. To explore further the general problem, let us consider five key academic disciplines: economics, demography, ecology, epidemiology and political science. Their principal foci are, respectively: (i) optimizing the production and exchange of goods and services; (ii) population size, growth and composition; (iii) understanding ecosystems, their internal relationship, and their member species; (iv) elucidating environmental and social influences on risks of disease and estimating future risks to population health; and (v) assessing the implications of population size and distribution and resource use for security, stability and the capacity to honour international commitments.

Each of these disciplines is formally constrained by the prevailing boundaries of its particular set of theories and ideas. There is nothing unusual in that. The problem arises when it becomes clear that a discipline’s existing theoretical framework is in fact now inadequate to deal with the social issues that press upon us.

Neither mainstream economics nor demography incorporate sufficient appreciation of environmental constraints, particularly those relating to the limits of biophysical and ecological

systems, into their thinking. Rather, they view the world as if it were an open system, within which their discipline-specific processes occur freely. Although ecology has broadened its perspectives significantly in recent years, many ecologists still employ a conceptual framework that excludes consideration of both human influence and human dependence on ecosystems. Contemporary epidemiologists primarily focus on individual-level behaviours and circumstances as causes of disease, thereby overlooking the broader ecological dimension which draws attention to the underlying social, cultural and political determinants of the patterns of disease risk within and between populations. Political science is, unsurprisingly, preoccupied with questions to do with national security, social stability, and, on occasion, the balance of tensions between neighbouring countries in relation to resource access and population movement. It does not normally engage with contemporary questions to do with forms of social organization appropriate to the achievement of sustainability.

These (and other) disciplines have their primary origins in nineteenth-century European thought. They have inherited a world-view that predated modern understanding of the complex interplay between species, the physical world and ecosystems, and of how human evolution and consequent human biology and behaviour have both developed in relation to, and have shaped, those natural phenomena. This intellectual legacy impedes an ecologically-informed approach to the issues of population size, environmental impacts, human wellbeing and, therefore, sustainability.

This critical review is elaborated below.

Synoptic critiques, discipline by discipline

With respect to economics, markets are central to neoclassical economic theory. Hence, the turnover of conventionally-traded goods and services is used as a measure, often erroneous, of progress. In recent decades, “environmental economists” have extended that market-based calculus further, to accommodate the inadvertent “externalities” (spill-over effects) upon which a market price can be imposed so as to render transactions less environmentally damaging. Ecological economics takes the further, major, step of incorporating environmental sustainability and human carrying capacity as central criteria of analysis and planning.

Nevertheless, there is, as yet, little evidence of penetration of the main principles of these sub-disciplinary developments within mainstream economics. Instead of viewing the economy as a dependent subset of the biosphere, most economists continue to hold the reverse view. On that reverse view, lost environmental assets, including local ecosystems and, sometimes, entire species, become a tradeoff against the demand for material gain.

Demographers are principally concerned with the size, age structure, and dynamics of past, present and future human populations. Consideration of the influence of economic and environmental factors on birth rates is not integral to demographic theory and models. Likewise, the role of resource imbalances as causal influences on some of the changes observed in fertility rates and regional life expectancies is paid little attention in demographic literature. The notion of human carrying capacity is generally regarded as being not relevant for the human species. Hence, most demographers display little awareness of the likely impacts of global environmental changes on future changes in human population size.

The recent decline in population growth rate is generally welcomed by demographers, and, for some, the issue of sustainability is thus indirectly acknowledged. However, the worldview of demographers approaches that of many economists in assuming an open-frame setting, free of the constraints of the biosphere's carrying capacity.

Ecology is nearer to the conceptual centre of the topic of environmental sustainability. Ecologists understand the structure, functioning and intrinsic interdependencies of populations and ecosystems. However, because ecologists' thinking reflects the prevailing reductionism of western science, much of their conceptual and theoretical framework disregards connections of the natural world to the human species, and its fundamental influence of humans on any ecological process.

The fledgling interdisciplinary field of "ecosystem health" has emerged in recent years. It has sought to explore linkages and analogies between ecosystem vitality and function and human wellbeing and health. There is increasing recognition that humans are "keystone" species and integrative approaches to understanding co-evolving social and ecological systems have developed.

Epidemiologists study the distribution and determinants of disease in human populations, in order to formulate interventions to prevent disease. The original discipline, in mid-nineteenth century Europe, focused on describing and explaining health differentials between geographic regions and population subgroups. Subsequently, as infectious diseases were replaced by noncommunicable diseases in western populations during the latter twentieth century, epidemiologists have refocused on individual behaviours and experiences as the "causes" of disease. Populations have thus come to be viewed primarily as unstructured aggregations of individuals exercising free choices as consumers and citizens.

There have been recent corrective influences. The resurgence of infectious diseases has re-emphasised population-level phenomena, including cultural practices and technological choices. The dramatic changes in health and life expectancy in the ex-Soviet bloc countries, following the collapse of communism, highlighted the fundamental importance of social, economic and political conditions and institutions. Meanwhile, there is nascent recognition, and associated formal research, in relation to the risks to human health, both now and in the future, posed by global climate change and other global environmental changes.

Political scientists are interested in understanding the theory and practice of social organization, the development of social policy and the exercise of political power. The evolution of political ideology, often in close association with ideas about economic management, distributive fairness and relationships between population subgroups, is central to the discipline. Environmental constraints and, in particular, the tensions associated with approaching or exceeding local carrying capacities are not yet integral to the disciplinary corpus.

Both history and politics tend, conventionally, to focus on politicians, community leaders, trading relations, warfare, treaties and issues of security. Issues of moral philosophy and international ethics are also addressed. However, the unspoken premise of political science is that human affairs proceed without much accountability to environmental limits.

Conclusion

These and other key disciplines in Australia remain, for the moment, impoverished by the often blinkered view that they take of the subject matter of “population and environment”. However, as complex systems science gathers momentum and respectability, there is an increasing enthusiasm for looking across disciplinary boundaries and for seeking to understand the complex interplay between processes and sub-systems in these various disciplinary domains. This process would be enhanced by a declared recognition of the general problem that we all face, as potential participants in this broad debate, and by an attendant readiness to declare and discuss our priorities, prejudices and value systems.

Note: In part, this response draws on ideas that have been further developed in McMichael et al., *Science*, in press.