

An Overview of Pacific Sustainability - Challenges for People and Institutions¹

**R. Gerard Ward
Nancy Davis Lewis**

Abstract

Sustainability for the Pacific Region is a complex goal. It requires multidisciplinary strategies taking account of social and cultural, as well as ecological and economic factors. It must allow tradeoffs between unlike goals. In the Pacific Islands scale is a key consideration. Small land areas bring particular risks for communities, while the time taken to recognize risks and to devise solutions is a major problem. Multi-disciplinary organizations and educational institutions have important roles in bringing understanding of threats to sustainability, and devising the strategies needed to secure it.

Introduction

Unless humans are able to achieve forms of environmental and development management which allow the earth's living space and resource base to be sustained, the long-term future of our planet as a home for the human species, and most other species, is very bleak.

¹ This paper is a modified version of one presented at the First Conference of the Science Council of Asia in Bangkok in May 2001. At that Conference the authors represented the Pacific Science Association, of which Professor Ward was then President and Dr Lewis was Secretary-General. That paper was published in the Proceedings of that Conference (Ward and Lewis, 2002). We are grateful to Professor Kiyoshi Kurokawa, President of the Pacific Science Association and the Science Council of Japan, and to the Science Council of Asia for permission to publish this revised and expanded version of the paper.

The United Nations projects that the world's population will continue to grow until 2075, reaching 9.1 billion (UN median variant projection). Most of the expected increase is in the developing countries. Naïve reliance on a belief that new technologies will somehow provide a solution to the increasing pressures of rising populations and living standards, to growing material demands on finite resources, and to problems of emissions and waste disposal will prove illusionary. If the target of providing adequate resources for the needs of the less developed countries is to be met, it is estimated that we need a ten-fold decrease in resource consumption in the developed countries. Increased efficiency of resource use must be accompanied by reduced demand.

Many people support the need to develop an urgent agenda for sustainability throughout the Pacific region. Given the unique features of the Pacific Islands region, with its many small island nations, great distances between islands, and fragile environments, the best routes to sustainability may be different from those in other regions – and not necessarily the same in all parts of the region. We would argue that the diversity of the earth and its peoples – environmentally, culturally, economically and socially – means that political, philosophical and ethical paradigms must be taken into account alongside scientific and technological knowledge and methods.

Science and engineering may have their near-universal language, values and approaches, but that is far from true when we consider other important dimensions of human decision-making which affect our degree of sustainability.

In this paper we point to some of the dilemmas which face us all in devising sound agendas and putting them into good policies and practice. These dilemmas, and the wisdom, values and heritage that must be brought to bear from different cultures make it inevitable that successful strategies for sustainability must be multi-disciplinary and involve pure, applied, and policy-oriented research. They must include indigenous views of the world, and take account of the varied cultural, social and political systems through which strategies for sustainability must be implemented.

What, and where, is to be sustained?

In discussion of 'sustainable development' many ideas are often

merged into a general global goal – maintaining the capacity of the earth to support its human population, and its flora, fauna and marine ecosystems for the generations to come. It seeks to meet the needs of the present without compromising the ability of future generations to meet their own needs. It encompasses both the principles of intergenerational and intragenerational equity. It is a noble goal, but it is as well to unpack this attractive, but elusive, package at the outset.

The two most commonly discussed components are ecological or environmental sustainability on the one hand, and economic sustainability on the other. The strict goal of ecological sustainability is to maintain environmental and natural life systems in perpetuity. The popular and common professional view is that the goal of economic sustainability means ensuring that ‘economic growth’ is sustained. We shall not go into the arguments of whether or not these two goals are compatible – many would simply say they are not. Certainly the strictest interpretation of the ecological goal has a strong anti-development component, while the goal of sustained economic growth frequently carries the risk of negative environmental consequences. Human needs inevitably force hard decisions when there is competition between people, flora and fauna for living space and resource use. Nevertheless, sound science, skillful education and political wisdom can provide the bases for compromise.

We would argue that compromises between extreme approaches are essential. We can all imagine situations in which ecological sustainability might be achieved in an area, but at the expense of the closure of the pre-existing economic activity, and the consequent destruction of the pre-existing society or community. If the societies for which sustainability is to be sought are themselves destroyed, is it ‘sustainable development’, or even ‘sustainable ecology’? Surely people and their societies are part of the ecology. Thus more consideration is now being given to a third component, ‘sustainability of societies’ or cultures. Those who argue for socially sustainable development generally stress the requirement that development should meet the basic needs of people, to ensure that ‘stable societies exist without poverty or injustice ... [because, as a consequence] environmental damage should [then] be minimised’ (Overton, 1999:7). It is argued that inequity and injustice in societies are likely to prevent environmental sustainability. Inequity and poverty will drive individuals to short term strategies and lead them to exploit to the maximum those

resources to which they may have temporary or illegal access. Bringing concepts of justice and equity into the equation reminds us of how important societal, political and philosophical values will be as we seek long-term sustainability for our region and the world.

Winners and Losers

Achievement of sustainability (of any category) involves trade-offs between unlike goals. This immediately raises philosophical questions, and ethical and moral issues. As soon as one gets more deeply into the design of policies for sustainability it becomes obvious that there will be winners and losers. Should we favour the common good or the private good when they are patently not aligned? A whole set of subsidiary questions flow from this. For example, one set of questions that is often overlooked is that of the spatial consequences of different policies. Which areas within a region should be addressed first, or which may be sacrificed? Should people be required to relocate to aid general sustainability in a region? This may simply move the pressure on resources to another fragile region. Or should systems be devised so that the winners and the losers are found within the same region?

Such dilemmas are common in situations where poor people, with few alternative means of support, overuse forests, agricultural lands or reefs and fishing grounds in their efforts to maintain their livelihoods and families. Forest reserves, established to protect ecological diversity or for national parks (or, in the post-Kyoto era, as carbon sinks) – all in the common good – may be severely depleted by the illicit removal of timber, fruits or fauna. Examples are found throughout the Pacific and Asian regions. They occur despite legal edicts because it may be clearly to the advantage of an individual to engage in this illegal activity, regardless of the common good. Solving the problem is not a simple matter of law enforcement – it will continue as long as alternative economic opportunities are not available, or until the local people receive benefits from the reserves which are commensurate, at both community and individual scales, with those they may obtain from illegal harvesting. The ‘tragedy of the commons’ is now being acted out in the forests of many parts of Melanesia. Over the last half-century or more the hills of the *talasiga* savanna and grasslands of western Viti Levu and Vanua Levu have been de-

graded by overgrazing and cane cultivation, without conservation measures, on land which is too poor or too steep for such use to be sustainable. Such practices benefit some individual voters in the short term, and it may be difficult for politicians and governments to impose the conservation controls that are necessary if the environment and whole communities are not to suffer in the longer term.

The same dilemma of balancing winners and losers is played out at the international or global scale, and made more difficult when likely winners and possible losers are far apart. Millions of people in Bangladesh and India, living in the lowest parts of the Ganges-Brahmaputra river delta, along with small atoll states in the Pacific and Indian Oceans and the Caribbean Sea, may be the most obvious and immediate beneficiaries of policies aimed to reduce global warming and sea level rise. Equally, they may be the most obvious losers if policies fail and sea level rise continues and frequency of extreme weather conditions increases.

We may be greatly disappointed, but probably not surprised, if politicians and leaders in advanced and high polluting countries, such as the United States or Australia, opt not to take measures that may have short-term negative impacts on their own electorates. Excellent scientific data may show that for the common good of all humankind a massive reduction in global emissions would be the scientifically and morally correct course. Yet it may be hard for politicians to adopt an ethical worldview if the benefits occur far away while the personal or political consequences of adoption are close at hand. In our search for worldwide sustainability, we are faced with a massive task throughout our region and beyond, to find ways in which philosophical and moral principles can be brought into the political and policy process with as much strength as self-interest seems to hold. It is a task to be addressed at all scales, and one made harder when different communities or nations hold different moral or philosophical paradigms. Some of the philosophical and religious systems of Asia and the Pacific have much more environmentally friendly teachings than do those based on Judaic-Christian beliefs, which have tended to exhort people to go forth and multiply, and to 'subdue' the earth.

In the Pacific Islands, indigenous environmental understanding and resource management practices have often been overridden by the ideas of 'development' and 'commercialism', judged to be non-scientific, and ignored by 'modern' bureaucracies. Yet indigenous be-

lief systems in the Pacific which were (and are) environmentally friendly have much to offer individuals, communities and governments as they seek to encourage sustainability. Fortunately this is now being recognized more widely.

The Question of Scale

One major factor that is often ignored in discussions of sustainable development is that of scale. The Pacific and Asian regions include several of the largest and many of the smallest countries in the world, whether we use population, land area, size of economies or extent of Exclusive Economic Zones as our metric of size. In our view, whenever a policy, program, or campaign aimed at fostering sustainable development is promoted, specific questions should be asked, and answered. At what scale will this policy be applied? At what scale will its results be effective? Which areas will benefit? Will there be deleterious effects elsewhere at smaller or wider scales?

Most people are probably fully aware that in the natural world many species, and whole ecosystems, require a minimum habitat area for survival. The interlocking web of life is commonly understood. Here is one example where the importance of scale is widely acknowledged, even if not always put into practice.

Many small islands in the region have had economic and environment management regimes or customs which were sustainable over centuries. Such systems were generally self-sufficient within their own small territories – not trading to any large extent with other communities; producing almost all their needs from their local land and sea resources. Of course not all such societies remained sustainable — for example it seems that on Easter Island, population increase, and socio-political actions, outstripped resource availability with devastating environmental and social results (Flenley and Bahn, 2003). But many did maintain sustainable systems, including those using shifting cultivation agriculture at low levels of population density. These self-sufficient, sustainable economies can only work at a small scale, in non-urban contexts, when virtually all needs can be provided locally. It would obviously be nonsense to suggest their application in the China or Japan of today. Equally, it would be totally impractical to suggest that such small islands could have a sustainable economy

within which environmental conditions were sustained, if they were to move towards industrialized agrarian enterprises with a multitude of trade links to other regions. The small scales of land area, resource endowment and population, together with the fact of spatial isolation, make that impossible within such bounded areas. Policies must fit the scale.

Issues of scale may be much subtler than the above example might imply. In considering the great goal of a sustainable world – ecologically sustainable, socially sustainable, economically sustainable – we must ultimately assume that we are thinking of the whole earth as our unit. But this does not mean that the ecology and environment must be in a fully sustainable and static state within every unit, island, or region of that earth. To do so would require an immediate end to much mining, urban growth, migration, change, and improvement in the lives of many. That is totally impossible. We must devise a range of policies and practices that move units or regions of different scales towards sustainability while recognizing that the systemic interactions within and between places and ecosystems allow for spatial tradeoffs. Some parts of regions may suffer some degradation, hopefully temporary, as the ecology of others becomes strongly sustainable. We need to recognize this at all scales from the local to the international and continental.

Some strategies, such as that for international trading in carbon credits against carbon sinks, do recognize this implicitly at a world scale, but they may tend to gloss over the fact that it may not work at all scales. For example, is it ‘sustainability’ if pollution makes the air of region ‘A’ toxic, while forests are planted in region ‘B’ to balance this? One might be sceptical about the trade in carbon credits between, say Japan and Australia, particularly when forests established in the latter country as carbon sinks may easily be destroyed by Australia’s frequent bush fires. Perhaps it will all balance out in the global circulation system but it is rather too naïve to make that assumption, or to assume that the distance between sources and sinks is neutral.

Another scale-related problem is that many small Pacific islands cannot spread the risk of natural hazards. On larger landmasses only a part of the land area is likely to be rendered unusable, temporarily or permanently by a single event. But a hurricane, or tsunami, which may damage only a small proportion of a large island or landmass, may wreak havoc over an entire small island or even a country. Such

events may leave no undamaged refuge areas on a small island. Niue provides us with a series of examples. In January 1960 a cyclone rendered 4,000 of Niue's 4,780 people homeless, left only 134 houses standing and wiped out copra production for two years (Ward, 1967:83). The damage from this hurricane was one of the factors stimulating subsequent emigration to New Zealand. In January 2004, Cyclone Heta wrought similar damage and led some commentators to question whether the whole resident population, by now down to about 1500, might be moved permanently to New Zealand. Storm surges have also rendered some of the northern atolls of the Cook Islands temporarily uninhabitable because their fresh water lenses have been contaminated by salt water. In February 2004 king tides threatened to inundate virtually the whole area of Tuvalu's nine atolls (*Dominion Post*, 19 February 2004). Larger land areas and countries do not face risks of proportionate magnitude.

In some small island states of the Pacific people have sought to counter the small size of their resource base by making transfers across long distances to ensure social sustainability, and they may achieve environmental sustainability as a by-product. It is unreasonable to expect that many Pacific islands, with their limited resource base, can sustain both economies and ecologies which would provide the levels of living to which many of their people aspire. Already many islands appear to have exceeded their crude 'carrying capacity' at any practical level of technology. The deliberate strategy many families have adopted is to have some members living and working overseas in higher income countries and sending back remittances to provide a higher level of income and living for the remainder of the family than could otherwise be produced locally. Social linkages are maintained. The exchanges flow in both directions – cash generally moves in one direction, and physical or psychological commodities (such as special foods, traditional goods, prestige or status) move in the other. These 'international household economies' do not always show up in national accounts of countries like Samoa and Tonga, but they may provide a mechanism for easing the pressure on island environments while allowing ecologically sustainable societies to continue in the islands. By widening the scale at which sustainability is assessed, a positive result may be achieved at the family and local scales, and pressure is taken off the local environment.

Another aspect of the problem of scale arises whenever we try to

sustain one part of a system. When we examine exploitation of the Pacific's fisheries resources, an outcome of the 'tragedy of the commons' type is a very real likelihood. We often plan on too small a scale, focusing on only one component; ignoring not only the biological interactions between populations, but also the human behavioural interactions within our systems of exploitation. World fisheries now take a total catch over four times that of 50 years ago. Within the world's marine fisheries, 65 per cent of fish populations are fully exploited or over-exploited (FAO, 2001). When nations or international bodies place limits on catches of specific species, it is natural behaviour for the fishing industry to divert effort from one species to another. Today, this is often towards a population that will not withstand intensive exploitation. For example, pressure over a very few years has placed some southern Pacific deep-sea species, with slow growth, long life spans and slow reproduction, under serious threat. The speed with which such species may become over-exploited is alarming – saving one species may sound the death knell of another. One could easily find other examples wherein a strategy to sustain one component of our environment or resource base could devastate another. We must always try and understand the whole fabric, and not just one set of threads, and we must act accordingly. Then the key problem becomes that of ensuring compliance.

Time

Time may not be on our side as it may take many years for people to change attitudes, and practices. In the first half of the nineteenth century, observers in the European Alps noted that unusually heavy floods were resulting from centuries of excessive clearance of higher altitude forests. Reporting on this, the American, George Perkins Marsh noted similar consequences of forest clearance in the northeast United States to those in the Alps (Marsh 1864). The relevant societies generally believed that it was proper for mankind to subdue the natural world, convert it to fruitful production and to human control (Lowenthal, 2000). It was almost a century before Marsh's warnings and suggestions began to have a significant impact in world intellectual discussion and research. Suitable intellectual climates need to be created (see Pretes 1997). But now we cannot afford such long delays

before concepts of sustainable development are fully embedded in the ideals and goals of all our societies. Modern communications do provide a means of faster take up of knowledge, but the process of educating whole populations, and especially political decision-makers, can still be very slow.

In this process of gaining knowledge and providing wide education, our scientific and educational organizations play a vital part. But many such organizations, and those who set their agendas, may not be sensitive to the needs of the environment. Because of the complex interweaving of social, political, economic, biological and natural processes that create our environments, success in achieving the goals of sustainable development will only come from close and effective inter-disciplinary efforts. Unfortunately institutional structures often tend to be narrowly discipline-bound. For example, teaching and research personnel in universities are often divided into narrow discipline units. Assessments of an individual's research performance, reputation and status tend to be made by peers from within the same discipline. Work that strays beyond the disciplinary boundaries tends to be discounted in assessments of quality and subsequent rewards. When the reward systems in science, social science and the humanities are based on the precepts of single disciplines, the type of inter-disciplinary work that is vital if sustainability problems are to be solved within a short time is often not encouraged. Thus valuable time may be lost in the search for sustainability. The role of those organizations that are explicitly multi-disciplinary in philosophy and approach become particularly important. Fortunately the Pacific region has a number of such institutions, international and national, which foster multi-disciplinary research and education, but nevertheless their efforts often take too much time to have effective impact.

One example that demonstrates both, that ideas and innovations take time to mature, and that regional institutions can play important roles, is provided by the Pacific Science Association (PSA). It is some thirty years since Professor Ian McTaggart Cowen, then President of the Pacific Science Association, addressed the Thirteenth Pacific Science Congress in Vancouver on Biota Pacifica 2000, and introduced the term 'sustainable development' to the region. He outlined the rapidly rising rate of species extinction in Asia and the Pacific. He noted that the 'only safe route is to look to the preservation of entire ecosystems' but warned that 'the unaltered biosystem' is still seen largely as

a challenge to 'develop' (Cowen, 1976:95). His paper was a very early call to action and for three decades the PSA has sought to foster work on sustainability. Its Coral Reefs Committee carried out much of the early work on the study and monitoring of coral reefs which is now the basis for greatly expanded efforts in many parts of the world. The same can be said of the Association's Biodiversity groups. Although there have been major advances in our scientific understanding of the processes and contexts of degradation of the environment and its biota, awareness of the social and political aspects of the problems is often weak. The region cannot afford another thirty years of slow progress towards this vital awareness.

One sign of hope for the Pacific Islands is that there are now a number of regional organizations that recognise the needs. The inter-governmental South Pacific Regional Environment Program — in the establishment of which the PSA had an important role (Pearsall, 1990) — does embrace multi-disciplinary approaches, as do several other inter-governmental organizations, such as the South Pacific Forum, the Secretariat of the Pacific Community and their associated agencies. One advantage such bodies have is that they operate at one step removed from the arena of national and local politics. It is often easier for them to promote programmes for sustainability than it is for national or local authorities because these latter are often beholden to, or subject to pressure from, local pressure groups and voters.

The major task now is to refine our scientific knowledge, and our understanding of how societies interact with their environments, and then, above all, to educate whole populations and inculcate new values. Universities in the region, such as the University of the South Pacific, the University of Guam, the National University of Samoa and the University of Papua New Guinea, have a special role in promoting these values. They must encourage multi-disciplinary understanding by research into and teaching of the particular problems of sustainability that face the Pacific Islands. The University of the South Pacific (USP) is fortunate in that its academic structures do encourage the possibility of inter-disciplinary work. Evidence that this has borne fruit may be seen in the approaches taken by many of the Pacific Island contributors to the four volumes on Science of Pacific Island Peoples published by USP (Morrison et al, 1994). These volumes are also notable for the way in which they combine understanding from indigenous knowledge with newer technological knowledge. Other

examples of successful adoption of ideas for sustainability promoted by universities and international agencies can also be found in the community-based projects for coastal and reef protection, and maintenance of inshore fishing stocks, which now operate successfully in parts of Fiji, Samoa and the Solomon Islands.

It is obvious that national educational systems in schools at all levels should be active in trying to instill understanding of the problems throughout the whole population. Furthermore, new attitudes and corporate strategies need to become standards in business. One example of the type of attitudinal changes that may be required is provided by the concept of 'natural capitalism' (Hawken et.al. 1999). Within 'natural capitalism' managerial goals incorporate the idea of minimizing "unsaleable output", such as waste gases, polluting by-products, which may be disposed of into public waterways, the by-catch in fisheries, or trash from forest exploitation. Natural capitalism would seek to turn these into profit-making products. In so doing the incentive for treating the environment as a free good is reduced, and pressure on these or other resources is also reduced. Proponents of natural capitalism argue that by following such policies profitability can be increased, thus providing the necessary incentive. Pollution taxes or credits may help increase the incentives. Wide implementation of such concepts requires not just new research and development in science, but parallel initiatives in economic, commercial and political research, training and policy formation. And as Wilbanks pointed out, 'it is possible that sustainable development will require an *ethical revolution* to go along with the other revolutions of our time' (1994:553).

The target for education in sustainability cannot just be the intellectuals, scientists, business executives and a few political leaders. One of the key roles for such groups is to change the broad intellectual climate so the ideals of sustainability become the norm. Millions of ordinary people, often in remote islands and rural areas, need to be won over. Millions of small individual decisions have massive total environmental impacts. Millions of individual voters influence the decisions of many political leaders. We cannot afford another century for the process to work through our systems. Too many of the processes of degradation may become irreversible. Unless public opinion is widely informed, time may run out.

Conclusion

It is clear that achievement of satisfactory mechanisms for attaining sustainability in our region, requires close integration of intellectual inputs from natural sciences, social sciences and the humanities. Most of the key issues span several disciplines across these broad branches of knowledge. They require integration of different disciplinary approaches in research programs. At the policy formation stages, close collaboration between academics, the public and private sectors, and decision-makers in governments is required. This may require changes in the current reward systems of academia, which are often discipline-bound to a counter-productive extent. Organizations such as the Pacific Science Association, regional universities and intergovernmental research bodies can play key roles precisely because they bring together scholars from many disciplines, and provide contexts in which multi-disciplinary and inter-disciplinary collaboration may flourish and be rewarded. It is essential that the understandings they achieve be dispersed throughout the Pacific Islands.

References

- FAO. (2001) *The State of World Fisheries and Aquaculture 2000*, Rome.
- Flenley, J. and P. Bahn (2003) *The Enigmas of Easter Island*. Oxford: Oxford University Press.
- Hawken, P., A. Lovins, and L. H. Lovins (1999) *Natural Capitalism: Creating the Next Industrial Revolution*. Snowmass, CO: Rocky Mountain Institute.
- Lowenthal, D. (2000) *George Perkins Marsh: Prophet of Conservation*. Seattle: University of Washington Press.
- Marsh, G.P. (1864) *Man and Nature, or, Physical Geography as Modified by Human Action*. New York and London.
- Morrison, J., P. Geraghty and L. Crowl (eds). (1994) *Science of Pacific Island Peoples*, 4 vols. Suva: Institute of Pacific Studies.
- Overton, J. (1999) 'Sustainable development and the Pacific Islands'. in J. Overton and R. Scheyvens (eds) *Strategies for Sustainable Development: Experiences from the Pacific*. Sydney: University of New South Wales Press. pp. 1-18.
- Pearsall, S. (1990) 'Emergence of the South Pacific Regional Environment Programme: a case study in Pacific Regionalism'. *Pacific Viewpoint* 31(1): 1-23.
- Pretes, M. (1997) 'Development and infinity'. *World Development* 25(9): 1421-30.

- Ward, R.G. (1967) 'The Consequences of Smallness in Polynesia'. in B. Benedict (ed), *Problems of Small Territories*, London: Athlone Press; pp. 80-96.
- Ward, R.G. and Nancy Davis Lewis. [2002] 'Pacific Sustainability'. *Proceedings, First Conference of the Science Council of Asia*, Bangkok, May 2001: pp. 71-8.
- Wilbanks, T.J. (1994) "'Sustainable development" in geographic perspective'. *Annals of the Association of American Geographers* 84(4): 541-56.

R. Gerard Ward is Emeritus Professor in the Centre for the Contemporary Pacific, Research School of Pacific and Asian Studies, The Australian National University, Canberra.

Nancy Davis Lewis is Director, Research Program, East-West Center, Honolulu, and Secretary-General of the Pacific Science Association.