

# *Eco Principle, The: Ecology and Economics in Symbiosis,*

by Arthur Dahl:

**Review by Stephen Vickers**

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## *The Eco Principle*

**Author: Arthur Lyon Dahl**

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**Review by: Stephen Vickers**

The author's intention, as explained by his preface, is to place "ecology and economics in symbiosis." The book's intended audience is the general reader, although Dahl makes no secret of the Bahá'í inspiration behind his ideas and his work:

As a life-long Bahá'í, I have always been interested in what leads to harmony and unity in systems, including social systems and value systems, and their relationships to the other kinds of systems operating on this planet. This had inevitably coloured my whole approach to science and to the synthesis of many fields in this volume. (Preface, xi)

Dahl's preface acquaints the reader with his experience. He is a marine biologist with two decades of work on the fragile and complex environments of the South Pacific. While working in that region he laid the foundations for the South Pacific regional environmental programme, and then moved into the UN system, within which he has held a number of posts.<sup>(1)</sup>

The preface gives three valuable insights into understanding this book. First, most of Dahl's practical experience has been in the South Pacific. This region provides an almost faultless model of an environmental system encompassing a number of semi-autonomous sub-systems. A coral atoll is an immensely complex and sensitive system, partly self-contained, but with the sea and the air providing access for the interchange of materials, both organic and inorganic, between the atolls. Such a model provides an ideal inspiration for Dahl's concept of "Ecos" (see below). Secondly, the South Pacific region encompasses a large number of state jurisdictions, in which context Dahl clearly grew to appreciate the need for theory and practice encompassing both the scientific and the governmental. Thirdly, Dahl fairly candidly admits to a lack of familiarity both with economics, and with the literature of the interface between economics and environmental science:

It was only when the first version of the manuscript was circulated to some publishers and friends for review that my attention was drawn to the extensive and stimulating work by others on many of the issues raised, with which my own thoughts had independently or unconsciously converged. (Preface, x)

## **The conflict between ecology and economics**

These insights are valuable to understanding Arthur Dahl's approach. His starting point is that ecology and economics are two paradigms (après Kuhn) in conflict, and in his first three chapters he looks at

world problems from the perspectives of these two paradigms. No need to ask which side Dahl is on - economics is not only a dismal science, it is a science incapable of reflection:

Most economics practitioners are not prepared to stand back and question the frameworks, assumptions and beliefs on which their careers and whole lives have been built. (p. 2)

For Dahl, economics fails in part because it measures only monetarised production and consumption. It is hard not to sympathise with his view. With gross national product measured in this way, subsistence agriculture does not figure in national income at all while the cost of repairing vandalism, and similar activities which have no beneficial effect, nevertheless make a positive contribution to gross national product. The inability of economics to allocate values to environmental goods like clean air and water or thriving wildlife, its concentration upon short-time goals, its inability to favour necessities over luxuries and armaments, and its obsession with growth, have together thrown the world into crisis. Population is soaring, creating a deficit in both education and food. Non-renewable resources, including energy, are being depleted, while genetic diversity is declining. There is hope, in that the technology is available both to improve public transport, and to shift the emphasis to renewable resources. What is lacking are the will, the ethos and the conceptual tools to understand our global predicament.

### **The concept of the eco**

While many economists would claim that some of the theory, and even a little of the practice, of their discipline has already woken up to social and environmental cost accounting, few can doubt Dahl's assessment of the current global situation. His fourth and fifth chapters introduce his concept of ecos. Drawing upon systems theory, he proposes the term "eco" for any natural or man-made functional system with internal integrity and distinct features and behaviour enclosed within clear boundaries. The term can "apply equally to an organism, an ecosystem, a machine, a town, a nation, the Earth, or a star... (or) many human institutions" (47). Any eco possesses boundaries in three dimensions, and a resource base, an energy source (internal or external), material flux (i.e. movement of resources across the boundaries), dynamics, information and communication with the external. It is the information element which goes beyond traditional systems theory, and provides an excellent method by which economics and environmental science may be integrated. Dahl says,

This information on the organisation and integration of the eco is the critical factor determining its value or "wealth"...with the eco as a unifying concept, we can also redefine ecology as the study or knowledge of ecos and economics as the management of ecos. Both then take on a larger sense than in their traditional usage, and their complementarity becomes evident. (48-49)

Dahl's concept of the eco is impressively developed. The information content of an eco organises the energy and resources which flow through it. As an eco becomes too large it has either to split or to create smaller ecos "nested" within it. (An example of this latter situation is a city government within a state; while each is an eco in its own right, one is "nested" within the other.)

The concept clearly makes it possible to utilise the same frameworks and vocabulary for both "human" and "natural" ecos, and to address both economics and the environment. Those characteristics of ecos which can be measured, and which are equally relevant to human and natural ecos, include *inter alia* transport, circulation, the balance in the materials account, the energy pathway, efficiency; information storage, signalling or control; and productivity.

Nor does the concept serve merely to describe functional systems. Dahl's prime motivation, as both an environmentalist and a Bahá'í, is to create a conceptual structure that improves or maintains the social and

natural environment, and which maximises meaningful human consumption while minimising environmental degradation. Armed with the concept of the eco, he does this quite successfully. Central to the concept is:

...the emphasis on information storage and flow as the key factor in understanding system functioning, and the evolutionary drive to use energy flow in the system to increase information content, structure and efficiency. It is this information dimension that helps to bridge our understanding of natural and human social ecos, as well as to incorporate the more abstract cultural, moral and spiritual dimensions of human systems into the theoretical framework. (56)

Moreover, the temporal dimension (change over time) is of central relevance. Taken together, these aspects in theory give a scale for assessing what is and what is not good for the eco. Dahl clearly intends the eco to be a normative concept.

In this vein, Dahl shows in chapter 6 that widespread adoption of the "eco" concept would avoid the grossest examples of environmentally-inappropriate economics. Using biological examples, Dahl demonstrates the ultimate unsustainability of economic models that centre around rapid and continuous growth, argues for the value of unique cultures, and demonstrates that current models of national accounting fail to take account of resource bases or environmental degradation. Moreover, developing his argument that the information content of an eco is its greatest resource, he criticises increasing privatisation of information, particularly the vesting in developed world companies the right to patents over plant and animal varieties. He suggests a compromise, whereby such patents can be held by a wider variety of individuals and groups than at present, including indigenous peoples and Third World farmers, but whereby access to and use of such information is freely available in exchange for a royalty.

### **Problems with the concept**

In practice, however, the authoritative allocation of values does not easily flow from the theory, however impressive it may be. The theory encompasses social, moral and cultural values in addition to economics. On a macro level, the eco theory yields clear prescriptions. To Dahl, "the value of an eco is best measured by its information content and connections; anything that degrades the information content reduces its value accordingly" (54). Therefore, for example, permitting cultural imperialism, on the back of economic power, to destroy a minority language is clearly not acceptable. The problem lies where tradeoffs are required, where there are marginal and apparently one-off decisions. "What shall it profit a man if he gain the whole world and lose his own soul?" certainly, but what about trading away 1% of his soul for 1% of the world? Which does a village need more, the turtle nesting area or the imputed income from the proposed hotel? On a global scale, the answer is obvious. Most species of turtles are endangered, and their nesting areas should be protected. Isolate the village as an eco, look at this eco in isolation, and, if the hotel also brings the technology to link into complex networks of information, perhaps by phone, modem or TV, measuring the relative diversity of information content with or without turtle nesting may yield the wrong answer.

Furthermore, some environmental ecos are so complex that it is hard to comprehend the precise policy priorities that flow from detailed knowledge of them. Dahl, drawing upon his expertise of the South Pacific, gives the example of a coral reef which he says could be characterised as an eco with 104 more ecos nested within it. Almost any intervention in the area would cause a crisis in the reef. In such an immensely complex situation the "eco", while a helpful descriptive concept, does little to help order relative policy priorities in an imperfect world.

### **Towards a more organic economics**

In his final chapters, 6 to 9, Dahl moves towards arguing for "a more organic economics," one in which the world economic system is completely integrated and where human and environmental needs are paramount. This is something which forms an article of faith to every Bahá'í, and the reader warms to its prose. The current writer, however, could not really discern precisely how this glorious vision derives from the concept of ecos. Unless--and this does not appear to be clearly stated--Dahl's early analysis of a coral reef as a plethora of nested ecos with constant recycling of energy, resources and information between them, and praise for its efficiency, provides a model for improving the flows of energy, resources and information around the earth. If so, the new world cries out for authoritative values of the type suggested by the Bahá'í administrative system. Without such authority, and in the context of a newly-resurgent capitalism, merely to discover what is best for the world looks like an expression of pious hope. Dahl fully appreciates this fact:

...this will also require fundamental changes in other human institutions and values of the type discussed elsewhere in this book...To adopt only free trade in the present context...would simply allow the strong to dominate and exploit the weak and increase injustice rather than efficiency. (88)

Nor is Dahl blind to some of the unpleasant facts of power inequality between classes or groups. Granted, "a system of free trade without customs or tariff barriers" may well "allow each nation or other geographic entity to specialise in those aspects of production that best suit its natural resource endowments, geographic position and human potential,.... (but) global free trade will also require harmonised levels of environmental protection and social welfare" (89-90). Thailand or China's comparative advantage in the making of plastic toys relies on their endowment of abundant cheap labour, certainly, but this endowment is strengthened by the lack of rigorously-enforced health and safety legislation. Dahl seems, like other Bahá'ís, to place great faith in the role of education and international debate in creating the conscious changes required to make these shifts. (See the review by Bryan Graham in this volume, page 15.)

While at first sight the idea of an eco may have seemed to be so generalised to be of little practical value, many of the most valuable insights which Dahl gives come when he addresses individual human beings and human institutions as nested ecos. He looks at education as a major means of increasing the information content of an eco, and examines effectively cases where the "human capital" of an eco (in these cases polities) has been positively or negatively affected by education.

Towards the end of the book the concept of ecos fades somewhat into the background, while Dahl presents an effective Bahá'í economic and social analysis of global problems. All in all, this book gives the reader a lot to think about, effectively presents a Bahá'í analysis of global problems, and introduces a concept which is an effective tool for looking at a variety of economic and environmental situations, but which is not so useful as a tool either for comparison or looking on a wider or global scale. The book is a useful contribution to the interface between economics and environment, although it is hoped that the next edition will give wider consideration to more recent developments in economic thinking, such as environmental cost accounting.

## End Notes

1. The choice of testimonials for the back cover looks at first well-balanced. There is a fulsome precis by Carl Djerassi, professor of chemistry at Stanford, which proclaims, "The really important books are those which provide ideas for a fundamental recasting of our thinking and institutions. This is such a book", and an equally approving comment from Elizabeth Dowdeswell, executive director of UNEP. The two other testimonials are from Lawrence Arturo, Director of the Bahá'í International Community's office of environment and Dorothy Marcic, a

Bahá'í who was a Fulbright Scholar at the Czech management centre. My immediate impression, of a work admired by scholars both within and without the Bahá'í Faith, was marginally dented by the knowledge that Arthur Dahl was educated at Stanford and now serves as Deputy Director of United Nations Environment Programme, which might imply that Carl Djerassi and Elizabeth Dowdeswell, while genuinely enthusiastic about the book, may not have been the most appropriate people to use as referees.

Principles of ecology. Notes. Earth is the only planet in the solar system that supports life. This is because of the three physical systems on it that is, soil, water and air which provide material essential for life. All the living beings differ from each other but they are all interdependent and interact with each other as also with, their environment directly or indirectly. In this lesson we study the earth's own life support system, the organisational levels of living beings and their characteristics. OBJECTIVE. Ecology is the scientific study of the relationship and interactions between organisms and their environment. The term ecology is derived from a Greek word Oekologie where "oikos" meaning "household" and "logos" means "the study of".

### 25.1.3 Organisation of Life. Ecological economics

Ecological economics is the study of the relationship between human housekeeping (economics) and nature's housekeeping. Put in another way, it is about the interactions between economic and ecological systems. Ecological Economics explores the value of nature (ecosystem services and natural capital), natural resource management, environmental quality, human health and wellbeing and how we can achieve change. Ecological economics acknowledges that a healthy economy can only exist in symbiosis with a healthy ecology. Why is it an important emerging field? An understanding of ecological economics is vital to tackling the challenges of the 21st century. Ecological Economics for their intellectual contributions and the community of scholarship and support they provide.

For another discussion of the place of ecological economics in recent intellectual and historical context, see Peter Hay, *Main Currents in Western Environmental Thought*, Bloomington: Indiana University Press, 2002, Chapter 8. xix. xx

### Introduction. Ecological economics

Ecological economics seeks to promote truly transdisciplinary research in which practitioners accept that disciplinary boundaries are academic constructs irrelevant outside of the university and allow the problem being studied to determine the appropriate set of tools, rather than vice versa. Ecological - economic modeling. Both ecologists and economists use models to develop strategies for biodiversity management. The eco-economic system operates both as a producer and as a cleaner of the environment, and the dynamics of the system is actually limited only by economic resources. Thus, in mathematical form it was described the optimization model of the industrial structure of an ecological-economic system based on both economic and environmental constraints. Article: *Eco-Economics - Environmental Strategies to Save the Planet and the Economy*. Environmental economics strives to show how ecological and market goals can be merged to generate an economy that is cleaner, more sustainable, and more prosperous when measured against true indicators. TREE-HUGGERS TRADE IN ROSE-COLORED GLASSES FOR GREEN EYESHADES Eco-Economics "Environmental Strategies to Save the Planet and the Economy". ECO-ECONOMICS. 5. The precautionary principle. This is just the age-old wisdom of "first, do no harm" and "look before you leap," but applied to public policy toward new products (like chemicals) and technologies that could pose serious risk.