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Book Reviews

Linking Industry and Ecology: A Question of Design, R. Côté, J. Tansey, A. Dale (Eds.), UBC Press(2006). 275 pp., ISBN: 0774812141

Industrial ecology (IE) is an emerging field rooted in the metaphor “an industrial system is an ecological system” while ecology has itself become a metaphor for complex systems characterized by adaptive, evolutionary processes. Basic to industrial ecology is the belief that there is much to learn from nature in designing (or redesigning) industrial systems to make them environmentally sustainable. The broader ‘complex systems’ understanding of the metaphor brings with it the recognition that in such systems we often cannot predict how our designs will perform and that such complex systems typically arise through an evolutionary process rarely characterized by ‘top-down’ control.

With design as its focus this book looks at industrial ecology from a number of perspectives, reflecting the concerns of the various chapter authors. A number of very interesting questions are asked. What does sustainability mean within the context of non-renewable resources? What does IE have to learn from agricultural and social ecology? What is the relationship of IE to housing?

System design first requires understanding the type of system with which we are dealing. In industrial ecology this means complex and multidisciplinary, involving social systems as well as ecological, economic, and technical systems. The relative lack of input from the social sciences has been a concern within the industrial ecology community. The recent recognition that changing consumption patterns are at least as important as changing production patterns is but an example of the need for some refocusing. To their credit, the editors have clearly chosen a set of authors to insure touching on all these areas.

An introductory chapter by Ann Dale makes the important point that, environmental concerns aside, design consistent with the goals of industrial ecology is increasingly necessary for economic reasons. With design as its focus, the book is divided into three basic groups of articles. The book's second section, Design and Ecology, specifically addresses the role of design within the field of industrial ecology. In Chapter 2 Nina-Marie Lister relates industrial ecology to ecological design and thus to the broader systems viewpoints of fields such as landscape architecture and systems ecology, reminding us that industrial ecology is as much about the design of industrial systems as industrial products. Chapters discussing the design implications of agricultural ecology, social ecology,

land use planning, and housing follow. The role of urban zoning laws, a relatively recent phenomenon, in limiting the diversity in the built environment, is one of the more interesting concepts introduced, particularly when one considers the importance attached to diversity in the sustainability of natural environments.

The third section begins by focusing more directly on this issue of sustainability. In Chapter 6 Nonita Yap points out that industrial ecology practices such as cleaner production and eco-efficiency, while necessary, are not in themselves sufficient to insure sustainability. Also necessary is a change in consumer behavior. This point is reinforced in the following chapters that emphasize the need for strategies of adaptation, innovation, and selective networking in order to promote new patterns of production and consumption.

The last two chapters in this section are in this reviewer's opinion among the most interesting in the book, for the reason that they question some basic assumptions often associated with industrial ecology, included some found in previous chapters of this book. Chapter 9 by Anthony Hodge looks at how mining, the exploitation of a non-renewable resource, fits into the idea of sustainability. Strategies such as sustainable yield are meaningless in this context. Particularly controversial is the idea that in some poor countries it might well make sense to heavily exploit a non-renewable resource in the relatively short term in order to get the economy going and thus insure sustainable future income. Chapter 10 by James Tansey argues that the model of ecological systems typically presented in industrial ecology is itself outmoded and oversimplified. Real ecosystems vary significantly in qualities such as stability, their ability to recycle materials and in their species diversity. Waste is not unknown in real ecosystems. Drawing lessons from nature by simply mimicking what happens there may not be so simple or necessarily effective as one might hope.

Because design is a synthetic rather than an analytic process, it needs to be imbedded in a iterative process of ‘learning from experience’. This is considered in the book's fourth section. Three very different case studies are presented, all describing difficulties and failures as well as successes. The final section consists of a concluding chapter by John Robinson and Asoka Mendis that both reviews some of the arguments made in previous chapters and considers the possibilities of broadening the scope of industrial ecology.

Two general comments about the book are in order. First, because it is multi-authored there is a certain amount of repetition of basic ideas. At the same time, it should be noted

that the editors and authors have made considerable effort to include cross references to other chapters with in the volume. Second, there is surprisingly little direct discussion of the role of population in the overall picture. I wonder if this omission reflects the Canadian roots of the book, a country with a low population density. Because all of the authors are either Canadian or have lived, worked or taught in Canada, and the case studies are all sited in Canada, the arguments are colored by the Canadian experience. One chapter focusing on this issue would I believe be a welcome addition to what I otherwise found to be an interesting and informative work.

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The Complex Forest: Communities, Uncertainty, and Adaptive Collaborative Management, Carol J. Pierce Colfer, RFF Press/Resources for the Future, Washington DC(2005), 370pp., ISBN: 1-933115-13-0

The Equitable Forest: Diversity, Community and Resource Management, Carol J. Pierce Colfer (Ed.), RFF Press/Resources for the Future, Washington DC(2005), 335pp., ISBN: 1-891853-78-3

The systematic analysis of the theory, processes, and early outcomes of Adaptive Collaborative Management (ACM) as a natural resource research and management approach lies at the heart of these two companion books, *The Complex Forest*, written by Carol Colfer and *The Equitable Forest*, edited by Carol Colfer. ACM is defined in *The Complex Forest* as “a value adding approach whereby people who have an interest in a forest agree to act together to plan, observe, and learn from the implementation of their plans while recognizing that plans often fail to achieve their stated objectives” (p. 4). The goal of ACM, a project launched in 1998 by the Center for International Research in Forestry (CIFOR), is to embrace the diversity, complexity, and unpredictability of human and natural ecosystems in order to develop collaborative management schemes that benefit both forest-dependent communities and forest resources. One of the driving concerns behind the research presented in both these books is the recognition that continued inequities in social relationships (e.g., male–female, permanent agriculturalist–shifting agriculturalist, North–South, wealthy–poor, plantation owners–smallholders; low caste–high caste) are key factors influencing the success or failure of management practices aimed at sustainable use of forest resources. Colfer and her co-authors join a rapidly growing group of social scientists that believe externally conceived and implemented conservation projects are ineffective at meeting both social and ecological needs. ACM, as an alternative to conventional approaches, fosters institutions that are flexible and responsive to local conditions and encourages local participation early in resource management

initiatives. The norm for many conservation and development programs is to first set a conservation agenda based on external criteria and then seek community involvement. Colfer and colleagues disagree with this approach, calling for full local participation in agenda setting and problem solving prior to the introduction of new management strategies. The premise underlying this strategy is that complexity and unpredictability is inherent in forest communities and that solutions must be developed collaboratively with the forest-dependent peoples whose lives are most affected by any changes in local resource management strategies. An important conclusion reached in both these volumes is that standardized solutions to conservation and development problems have failed in the past and will continue to fail in the future, due to their inflexibility in response to unpredictability and complexity. While Colfer and her colleagues cannot support any single standardized blueprint for resource management problems, they do hold hope for outlining a set of standardized processes that should be assessed in every context in order to enhance the chances of positive change in local livelihoods and conservation objectives.

The Complex Forest is divided into two sections. In the first section of the book Colfer outlines the concept of ACM, its intellectual underpinnings, and provides detailed explanations of seven key analytical dimensions or variables. These variables are: the degree of devolution of forest rights to the community level, the ecological forest type, the extent of population pressure on forest resources, the type of management goals for the forest, variation in human diversity among stakeholders, the level of conflict over forest resources, and the forms of social capital available to mobilize communities for collective action. A full chapter (or in some cases 1/2 a chapter) is devoted to each of these seven analytical dimensions. Each dimension is explained in a straightforward manner with easily accessible language. By grounding abstract concepts like social capital in concrete realities, such as how often the community plans functions together, Colfer provides relatively straightforward ways to assess the variables on the ground. After defining all the elements of each of the seven key variables, Colfer examines the commonalities and differences across the diverse case studies in terms of the variables. In the second part of the book, the Appendix, Colfer presents 13 detailed case studies from Africa, Asia and South America, again examining the case studies in light of the seven dimensions and providing additional information specific to each site.

Colfer adopts a unique analytical strategy in her analysis of these distinct variables. Her approach is in part shaped by her role as a social scientist in an institutional setting (CIFOR) in which a sizeable number of scientists and the Board of Directors are committed to the idea that reductionist science is the only “real” science (p. 186). On one hand, CIFOR demonstrates the breath of its institutional creativity in that the ACM team was given the latitude to engage in exploratory research designed to develop new methods and approaches while attempting to measure indicators of positive change in forest-dependent communities. The results portions of Colfer’s analysis reflect deeply holistic, reflexive, qualitative, and nuanced thinking. Yet with each of the seven analytical dimensions Colfer worked to fit her initial analysis into a