

Martín Palmero, F., Ed. (2004). Desarrollo sostenible y huella ecologica: Una applicacion a la economia gallega. A Coruna, Spain, Netbiblo, S.L.



PROLOGUE by Keith Pezzoli

The economies of the world's most developed nations stir up a tremendous throughput of material and energy resources. Yet, it is difficult to actually measure the sources and waste sinks of this throughput. A recent study of Germany, Japan, the Netherlands, and the U.S. suggests that the immense volume of natural resources required to run a developed economy ranges from forty-five to eighty-five metric tons of material per person each year.ⁱ

Much of this material flow—including mine tailings, eroded soil, logging debris, and excavated earth and rock—does not end up in final products. The staggering tonnage of such flows accounts for as much as seventy-five percent of the total materials used in industrial economies.ⁱⁱ Given that such flows do not enter the economy as commodities they are not accounted for in national gross domestic product. This omission is problematic in so far as it impedes accounting for the massive scale of environmental alteration and externalities associated with such flows. And given the globalization of the economy, the resulting impacts of these flows (e.g., watershed pollution, habitat degradation) often register in poorer countries far from the developed economies that benefit most from the process. To enable so-called sustainable development, we clearly need better metrics, tools and methods to understand and evaluate the status of our earth's stocks of natural capital and the environmental services (flows) that these stocks provide to us. Fortunately, new analytic methods are being developed –and the *Ecological Footprint* is one of them.

This book is an outstanding contribution to the theory and practice of ecological footprinting—an analytic method for calculating the amount of productive land and aquatic area needed to keep a particular economy running. Dr. Federico Martin Palmero and his co-authors estimate that their home region of Galicia, Spain has an ecological footprint of 7.01 hectares per inhabitant. In other words, the collective production and consumption that takes place in Galicia requires 7.01 hectares (per capita) of productive terrestrial and aquatic ecosystems. This figure is significantly higher than Spain as a whole (4.9 hectares per capita); and it is in the same range as the most developed countries of Europe and the rest of the world. Why is Galicia's ecological footprint so large? Does it matter? What are the implications for urban, regional and national economic development policy? Dr. Federico Martin Palmero and his colleagues skillfully address these questions.

A particular community's or nation's ecological footprint becomes bigger as its demand increases for (1) regional and global stocks of natural capital (e.g., biodiversity, renewable and non-renewable resources) and (2) sinks to dispose of its wastes (e.g., forests to assimilate CO2 emissions from burning fossil fuels, wetlands to assimilate pollution from urban runoff). Such growth might not be a problem if the world was infinite in size, but the earth is a really a small and intricate place—it's only 8,000 miles in diameter. If all the earth's inhabitants had a quality of life similar to those living in Galicia or in other developed countries (i.e., if all of the earth's inhabitants used roughly the same level of resource flow and sinks as currently utilized in

advanced economies), then the global economy would need access to several more earths, perhaps five or six more earths according to some estimates. This raises serious concerns about economic and ecological sustainability. There is mounting evidence that aggregate levels of global production and consumption are not sustainable—that is, modern development trajectories are not meeting the needs of our current generation while also safeguarding the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987).

This book gives us an excellent critical overview of sustainable development while offering new insights into the political economy of environment-development interdependencies. As a whole, the book makes several major contributions: (1) the multidisciplinary case study approach constitutes an important new benchmark in the field of applied ecological economics; (2) the application of ecological footprint analysis at an urban and regional scale provides important new methodological advances, and (3) the authors' practical suggestions regarding green fiscal reform, double dividends, renewable energy, state intervention and economic instruments gives us a much needed “sustainability science” toolkit of ideas to translate principles of sustainability into action. I briefly elaborate on each of these points below.

The book was written by a multidisciplinary team of scholars. The authors come from three different academic disciplines spanning the social and physical sciences (Economic Analysis and Business Administration, Applied Economics, and Physics). This gives the book a serious grounding in earth systems, business and the practical reality of fiscal dynamics. This kind of integrated approach is crucial to efforts aimed at advancing sustainable development. Knowledge production is increasingly fragmented into academic divisions, disciplines and subdisciplines. This makes communication across different language communities within the academy (e.g., biology, engineering, urban studies, economics, business, etc.) increasingly difficult. New studies on the organizational culture of innovation document how multidisciplinary collaboration can spur creative synthesis. This book is proof. Sustainability science in the form of ecological footprint analysis is the fruit of multidisciplinary analysis and synthesis.

Over the past two decades, thousands of academics, researchers and activists from around the world have churned out a vast literature analyzing the diverse, often conflicting, theories and practices of “sustainable development.” A wide range of actors—including governmental, corporate, non-profit, grassroots and all sorts of combinations of these—are engaged in project/policy developments aimed at promoting sustainability. Much of the discourse calls for integrating the so-called three Es of sustainability: equity, economic efficiency and environmental stewardship. The theatre for these efforts spans geographic scales (local, regional, national, city-region, transborder, global). The formal and informal institutional drivers are also varied—including government agencies, social movements, public-private sector collaboratives, corporate associations, international and regional institutions, networks, research-based consortia, among others. While some of this work is very good, much of the work with a policy and planning focus lacks a significant grounding in science. And the reverse is true too. Much of the work with a serious scientific emphasis lacks a significant grounding in social and political realities. In this light, one of key messages of this book is that we need to do a much better job integrating environmental concerns with other key challenges involving transportation, agriculture, services, consumer lifestyles and consumption patterns.

When first generation environmental policy was initially drafted several decades ago many of the new types of environmental problems we face today were not yet in view. Now there are serious gaps in what environmental regulations cover. Current environmental laws in Spain, Europe, the U.S. and around the world focus almost entirely on manufacturing facilities, especially the larger industries that have historically been the most heavily polluting (e.g., refineries, chemical and power plants, automobile industry). But new types of environmental problems have emerged including, among other things, non-point source pollution from nutrients, bacteria, sediment, pesticides, and chemicals that runs off millions of backyards, farms and streets into storm drains. Diffuse sources of pollution also include such things as emissions from gas stations and millions of motor vehicles. Emergent problems that have eluded traditional environmental policy approaches include the atmospheric build-up of carbon dioxide and other greenhouse gases, the potential environmental impacts of genetically modified organisms, urban sprawl resulting in loss of habitat and biodiversity, pesticides that might disrupt human endocrine cycles, and the erosion of earth's protective ozone layer in the upper atmosphere.

Ecological Footprint analysis offers us one way to gain a better understanding of development from a much-needed whole systems perspective. Internationally renowned biologist E.O. Wilson suggests that most of the major problems vexing humanity today, including environmental destruction and endemic poverty--can be solved only by integrating knowledge from the natural sciences with that from the social sciences and humanities. Ecological footprint analysis is a method that seeks this kind of integration.

A second major contribution made by this book is the application of ecological footprint analysis to an urban and regional scale. Until the early-1980s, regional development was typically viewed (within the disciplines of regional economics, development economics, and economic geography) as an outcome of exogenous political and economic processes. Regions were not viewed "as a fundamental unit of social life in contemporary capitalism equivalent to, say, markets, states or families, nor a fundamental motor process in social life, on the same level as technology, stratification, or interest-seeking behavior" (Storper 1997). Since the early-1980s, however, greater attention has been paid to analyzing the region as a fundamental basis of economic and social life. This new found interest in regions (the so-called new regionalism) is promising, but much of it lacks scientific grounding in environmental systems. That is beginning to change. The U.S.-based National Research Council's (NRC) Board on Sustainable Development in conjunction with the U.S. National Academies (National Academy of Sciences, National Academy of Engineering, and Institute of Medicine) makes a compelling case for a regional emphasis. The NRC's report, titled: *Our Common Journey: A Transition Toward Sustainability*, identifies the region as the most useful territorial unit for organizing purposes. The argument goes as follows: "it is in specific regions with distinctive social and ecological attributes that the critical threats to sustainability emerge, and where a successful transition will need to be based" (National Research Council (U.S.), Policy Division. Board on Sustainable Development 2000). In light of this rationale, authors of the NRC report call for integrating knowledge and action by way of building regional information systems. The European Union is supporting reference to Ecological Footprints as a means for evaluating progress toward sustainability; putting value on those projects that reduce a projects footprint. This book begins to provide tools necessary to do this on a regional scale by merging economic and environmental analysis in new ways.

This book also succeeds in advancing a critical yet constructive form of sustainability science. Sustainability science aims to understand society-nature interactions and interdependencies from an integrated whole-systems perspective. Kates, et al. argue that “such an understanding must encompass the interaction of global processes with the ecological and social characteristics of particular places and sectors” (Kates, Clark et al. 2001). Kates is one of the leaders of the *Network for Science and Technology for Sustainability*, one of the world's most significant global networks dedicated to sustainability science.ⁱⁱⁱ The U.S. National Research Council's (NRC) Board on Sustainable Development has identified three high priority tasks for advancing the research agenda of sustainability science. Dr. Federico Martin Palmero and his co-authors makes progress on each of these important agenda items: (1) develop a research framework for the science of sustainable development that integrates global and local perspectives to shape a place-based understanding of the interactions between environment and society; (2) initiate focused research programs on a small set of understudied questions that are central to a deeper understanding of those interactions; and (3) promote better utilization of existing tools and processes for linking knowledge to action in pursuit of a sustainability transition (National Research Council (U.S.). Policy Division. Board on Sustainable Development 2000).

In conclusion, this book meets an urgent need for new methods that can help us link local strategies of community-based development to regional comprehensive planning, and, in turn, to link regional comprehensive planning to networks that tie together the world's city-regions. Along such lines, a promising new group has formed called the Global Planning Educators Interest Group (GPEIG). GPEIG's mission is to share global perspectives in planning education and research. GPEIG is an interest group of the Association of Collegiate Schools of Planning (ACSP) and a member of the newly formed Global Planning Educators Association Network (GPEAN). The Association of European Schools of Planning (AESOP) is a member of GPEAN. AESOP is a network of universities and university departments that teach and conduct research within the field of urban and regional planning. I mention this because ecological footprint analysis is an outstanding tool to bring a global ecological perspective into planning education and practice. The authors of this book fully recognize that sustainability is a complex challenge. Their effort to refine tools for improved analysis should be applauded. Their work provides us with a compass that will undoubtedly prove to be very useful.

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i. A. ADRIAANSE, ET AL., RESOURCE FLOWS: THE MATERIAL BASIS OF INDUSTRIAL ECONOMIES, a joint publication of the World Resources Institute (WRI); the Wuppertal Institute; the Netherlands Ministry of Housing, Spatial Planning and the

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ii. WORLD RESOURCES INSTITUTE, ET AL, 1998-1999 WORLD RESOURCES, A GUIDE TO THE GLOBAL ENVIRONMENT: ENVIRONMENTAL CHANGE AND HUMAN HEALTH 161 (1999).

iii <http://sustsci.harvard.edu/>

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