Sustainability: Theory and Practice Margaret Robertson Sabbatical: Fall Term, 2010

I am in the process of writing a textbook, *Sustainability: Theory and Practice*, to be published by Pearson in 2012. It is a big book with a big scope and has consumed many months of work. I used the summer of 2010 and one term of sabbatical in fall of 2010 to write the main body of the text.

What is sustainability?

The word "sustainability" can be used in two ways: as an idea and as a professional discipline. "Sustainability" as an idea refers to the body of knowledge that deals with systems and processes which are able to operate and persist on their own over long periods of time. Examples include ecosystems and the Earth system or Gaian system. This body of knowledge also includes what we know about the current health or decline of such systems.

Discussions of sustainability often include an idea known as the "triple bottom line," sometimes referred to as the three pillars of sustainability or the "three E's," where the letter E stands for Environment, Economics, and Equity. Planners at the United Nations, the Earth Policy Institute, and many other experts have realized that we as a planet have many problems that are connected, including climate destabilization, poverty, health issues, overpopulation, resource depletion, food and water scarcity, political instability, habitat destruction, and extinction. Experience repeatedly shows that we cannot prevent degradation of environmental systems unless we also promote healthy economic systems and social equity. The triple bottom line of sustainability is about fostering human communities that are healthy, safe, and secure, with economic opportunity for everyone, while keeping Earth's life support system in good shape. What began as an environmental movement has been renamed, and is now called sustainability.

"Sustainability" as a professional discipline refers to humanity's rapidly evolving response to the urgent planetary challenges we all face. The response includes emerging professional opportunities. Increasing numbers of organizations are hiring people with job titles such as sustainability coordinator and sustainability director. Those future professionals are a primary audience for this book.

Although the concepts that underlie sustainability have become well-established, "sustainability" as an academic field is very new. In fact, the field is still forming. The primary challenge facing the formation of sustainability as a discipline is its interdisciplinary nature. In any one of the sciences or social sciences, for example, it is clear what is within the field of study and what is not. Sustainability, however, concerns the survival of the entire planet and its inhabitants as a whole, and that means many areas of study are relevant. Practitioners must be able to comprehend accurately a range of issues drawn from a broad and varied body of knowledge. They must be able to look carefully and deeply at scientific, technical, social, political, and economic details.

At the same time they must be able to look at overarching frameworks realistically and be able to understand how details fit into larger systems at a planetary scale. The successful sustainability practitioner must have a broad, interdisciplinary grasp of the biophysical world, human society,

and the interactions between the two. Sustainability competence requires not just knowing discrete pieces of knowledge, but also thinking about connections from a systems perspective; it requires being able to see Earth's multiple systems as an interconnected whole.

Thus an emerging sustainability professional will need a broad education and a mental toolbox of critical thinking skills. Armed with knowledge and clear thinking, the professional will then need the ability to encourage, to motivate, and to inspire. This book hopes to provide a foundation for these thinking skills.

Structure of the book

The book's content is divided into four sections with 35 chapters. Section I is titled Overview. Chapter 1, What Is Sustainability?, examines sustainability as a concept and as an emerging discipline. Chapter 2, A Brief History of Sustainability, traces where we have been and where we appear to be going. Chapter 3, The Living Planet, and chapter 4, Gaia: Earth Systems Science, examine what kinds of conditions have allowed life on our home planet to continue over long periods of time.

Section II, Issues, then takes measure of the actual conditions on the planet, and helps students evaluate whether the current state of our planet is indeed one that can endure without failing. The chapters study details of modern life and see what about them might or might not be sustainable. Chapters in this section include: Climate Change, Water Issues, Ecosystem Change, Human Health, Human Population Growth, Pollution Issues, Fossil Fuels, Food Issues, Failing States, and Economics. It turns out that the current state of the planet is not good. In fact, a variety of indicators all point to the same conclusion: the situation is dire and getting worse, and we appear to be nearly out of time.

Yet there is hope. In fact, that is what this book and the sustainability profession are about. The last two sections of the book give the student and future professional tools for taking positive action. We might be on the brink of disaster, but we may also be on the threshold of an unprecedented and regenerative era. As in all living systems, particular individual contributions add up to an emergent whole that is greater than the sum of its parts. Each of us has pieces of solutions that we apply in our particular part of the world, and taken together, these pieces are beginning to assemble into a picture of a new and potentially sustainable world.

Section III, Strategies and section IV, Organizational Skills go on to examine, across a range of scales from local to global, what kinds of actions and changes will be needed to restore the planet to sustainability. These sections look at a variety of strategies and tools that students can employ as individuals but especially as professionals working in this emerging field. Chapters in section III, Strategies include: Climate Stabilization, Ecosystem Restoration, Stream Restoration, Stabilizing the Human Population, Pollution Remediation and Prevention, Renewable Energy, Energy Efficiency, Water Efficiency, Stormwater and Wastewater, Sustainable Sites, Soil Conservation and Renewal, Green Buildings, Green Manufacturing, Waste and Recycling, Food, and Livable Cities. Chapters in section IV, Organizational Skills include: Certification Tools, Indicators and Measurement, Working in an Organization, Working with People, and Education.

Why this book?

A survey of the literature reveals literally thousands of titles which deal with sustainability in some form. However, each focuses just on a piece of the puzzle. A book might talk about renewable energy, for example, or about how to implement sustainability initiatives in a business. None provides an overview of all the topics together, and none gives a comprehensive combination of the conceptual and the practical. If you are an undergraduate student and you want to work as a business manager, or as an energy manager, you can buy a textbook that guides you through the aspects of that field. If you want to work as a sustainability coordinator, however, you have no written textbook to which to turn.

This book tries to give a comprehensive overview of the field of sustainability. It will prepare the undergraduate student for a career as a sustainability coordinator or for a career in one of several related fields, as well as providing a body of knowledge that can be used as a reference by the sustainability professional already in practice. A survey of faculty who teach sustainability-related courses from colleges across the country indicates that none has found a textbook that works, and that instead instructors are patching course materials together from multiple sources including articles, websites, and their own handout packets. This book tries to address that gap.

Research and writing during the sabbatical

During my sabbatical, I pulled together research and wrote the body of the text. Because sustainability is fundamentally interdisciplinary, the body of knowledge covers a broad range of subjects. This meant collecting, reading, and collating a vast and varied amount of material.

The first step was to structure an outline. What should the chapters be? How should they be organized? What subtopics should go into which chapter? This same outline then became a computer file structure with folders and subfolders in which research notes could be stored.

Once I had a framework worked out, I collected source material. I began with about 300 books from the University of Oregon libraries and interlibrary loans, around another 300 books from my own collection, and vertical files full of journal articles I had amassed over the years. In a crude sort of cataloging system, I shelved the books by wrapping them in recycled paper sleeves, each numbered and labeled with chapter topics. I then methodically read through the shelves, chapter by chapter, occasionally jumping out of order when an interlibrary loan book was about to come due. As I read, I took notes electronically. I then went back through the written notes, copying and pasting relevant information with citations into documents within the topical file folders.

Because this book serves as an introductory guide to the aspiring sustainability professional, it is important that students learn which books, journals, organizations, and scholars are the standard, recognized sources in each of the sub-areas. "Green" is the new hot trend, and lots of people are jumping on board. There is a lot of fluff, misinformation, and intellectual myopia out there, more than in many fields. The discipline is so new that, while myriad professional journals and societies explore a range of issues that affect sustainability, there is as yet no single academic or professional society for sustainability and no single official publication that speaks for the profession. Thus doing a careful citation analysis and looking at peer reviews were particularly important in selecting materials to be used as information sources.

For the writing process itself, I used an electronic version of the old researcher's index-card method. I created a more detailed outline of each chapter. I created a Word document for each subpart (one to three paragraphs) of each chapter, combed through the research I had collected, and placed relevant pieces of research into their relevant documents. I called those hundreds of sorted topical documents "baskets," and called this process "filling the baskets." I could then take the bits of material in each "basket" and begin writing. By the end of the sabbatical I was not done, but did have enough completed that I was able to finish writing the remaining chapters and submit the full body of written text to the publisher by an April deadline.

Challenges

One of the challenges was finding a balance between accessibility and academic rigor. This material needs to be scholarly, academically rigorous, and accurate. Yet many of the readers will be nonscientists, and so the voice and tone need to be clear and straightforward, presented without lofty jargon or complex syntax, and understandable by the average first- or second-year college student. The goal was a book which could be accessible to readers at multiple levels, with ample detail to retain the interest of the intellectually curious, yet written in a voice to appeal to any moderately educated reader.

Another one of the challenges was deciding what to include and what to omit. Most of the chapters in this book are directed toward citizens and sustainability professionals who will be living in or working in the United States. While it could be argued that sustainability is really about the whole world, a book about the whole world would be infinitely large. Thus any writing on sustainability must, of necessity, choose what to cover and what to leave out. I chose, for the most part, to leave out detailed discussions of countries outside the U.S. in order to keep the scope within manageable limits. However, the whole world is, in fact, interconnected. Certain sustainability issues by their nature can only be considered by looking at connections on a global scale. The problem of failing states is one such issue, and I did elect to include a brief chapter on that subject. Perhaps subsequent editions of the book can be expanded to include more global connections.

Another challenge was managing the sheer volume of data. At present, my computer file for this textbook contains over 18,000 files in 1100 folders. Having an outline and a clear file structure from the beginning were necessary for survival.

The rest of the process

Reviews are another piece of the process. The manuscript has been through three cycles of review by outside reviewers, with a fourth review cycle scheduled for this fall. Because sustainability is such a nascent field, with practitioners hidden among many disciplines, the publisher had a hard time finding appropriate reviewers. Each batch of reviews had only four reviewers, some more helpful than others. It was a small sample set. In addition to these reviews, LCC faculty member Phil Martinez read the chapter on Economics, offering fine-tuning in one section but otherwise pronouncing it solid, which was reassuring. LCC faculty member Tamara Pinkas faithfully read every chapter as it was completed—an impressive total of 439 single-spaced pages. Tamara spotted typos, noted where sentences were hard to understand, and suggested places where more examples might help.

In years past, a publisher would have assigned a developmental editor, a kind of project manager, to work with each author. However, publishers are on lean budgets today and often outsource many tasks. Instead of a developmental editor Pearson hired an outside contractor for my project, who has made some helpful suggestions about pedagogy and marketing but otherwise left me alone, for which I am thankful.

In the current phase of work, I am putting together pedagogical devices to help students develop critical thinking skills. Primary among these is a set of questions and problems for the end of each chapter. These questions and problems are divided into five categories: Chapter Review, Critical Thinking and Discussion, Sustainability by the Numbers (a title suggested by LCC faculty member Claudia Owen), Research Problems, and Projects and Group Activities. I will also be writing Think-About-It boxes for some chapters. I will be adding to the number of sidebars; these offer one opportunity to bring in global examples. I will be writing Learning Objectives for the beginning of each chapter and Making Connections (otherwise known as a summary) and a list of Key Terms for the end of each chapter.

I am also in the process of compiling illustrations. A typical copyrighted photograph costs \$150 for purchase. Since this book will have many scores of illustrations, purchasing photographs would be prohibitively expensive. Therefore, I have turned to my own photographs and to images in the public domain. I have visited green projects in Eugene, Portland, and Vancouver and taken photographs; it remains to be seen whether they are good enough to be usable. I have combed through the image galleries of every U.S. federal government agency, collected and filed appropriate high-resolution images. (Images from state and local agencies are often not in the public domain.) This in itself was a large research task, since every agency is organized differently and many of them provide galleries of thousands of images through which to sift. From the collected images, I will make final selections, compile the images into an "art manuscript," and fill out an "art log" and "permissions log" as required by the publisher.

Where there are gaps in needed illustrations, I will then send permission requests to copyright owners, who sometimes are willing to grant permission free of charge. Finally, like most publishers Pearson has a graphics department. My task is to create sketches of any diagrams or drawings I want developed and submit them to the graphics staff, along with color suggestions. I expect this to involve several iterations of back-and-forth communication.

Finally, I will compile the glossary and, if there is time, appendices. I will also learn to use Microsoft Word's indexing feature and prepare the manuscript for the professional indexer, who is also an outside contractor.

When the final, finished manuscript is delivered to Pearson in November, another outside contractor will step in. Production and printing no longer happen in-house. This process is contracted to an outside production house. Careful reviewing of galley proofs during the month of December will be time-consuming but essential.

This has been an exhilarating, depressing, frustrating, inspiring, exhausting, energizing, and allconsuming project. I could not have done it without a sabbatical, and am deeply grateful for this opportunity. If all goes according to schedule, the book will hit bookstore shelves in 2012, and I will start work on a second edition.