

Introduction: Shifting Paradigms

Our societies have entered a period of intense change. As we become aware that our actions are affecting the equilibrium of our planet, it becomes clear that many things need to be done differently. More and more consumers are willing to pay a premium for goods and services that are guaranteed to embody ecologically sound practices, and more and more producers and service providers are able to meet those needs. For businesses and consumers alike this involves a shift in values.

We are not talking about a little change in pricing, but a paradigm shift - a shift in fundamental, underlying values, a shift in what we value most in life. On the surface it looks like just another consumer trend, but this one goes deeper. We are beginning to understand that maybe the world doesn't quite work the way we thought it did.

There was a time when people believed the planet Earth was flat and at the center of the universe, and it took decades, if not hundreds of years, before our current revolutionary (!) concept of cosmic spatial arrangement was widely accepted. I think the present shift in awareness is perhaps even more profound as it requires each and everyone of us to change our behaviour.

Our current land management practices are based on the assumption of mankind's superiority over Nature. Somehow this world view then resulted in a perception of Nature as imperfect and in need of improvement (*see sidebar*).

How arrogant! We don't even fully understand how a single plant works, yet we assume that plants require improvement to make them perfect for our purposes. We generalize from the minutest details, assuming life to be mechanical and linear. But in reality nothing exists in isolation. Everything has multiple dependencies, multiple causes and multiple effects, and this complexity increases exponentially with biodiversity. Certainly it is important to understand the details, but they must be interpreted from an understanding of the whole. In case of the virtual plant, we must simultaneously research and understand the ecosystem in which it lives, the contribution it makes to the ecosystem, and the relationships it has with other beings and with the a-biotic environment. On a broader scale we must understand the workings of the planet before we can fully understand the workings of a plant.

Our current land management practices have, among others, produced the following results:

- The human food supply has become poisoned with pesticides and genetically modified organisms.
- The planet's food production capacity is being degraded at an alarming rate. In a press release of January 3, 2006, the

The National Science Foundation-Sponsored Workshop Report: "The 2010 Project" sums up our current scientific approach:

*"In order to most efficiently and safely **manipulate plants to meet growing social needs**, we must create a wiring diagram of a plant through its entire life cycle: from germinating seed to production of the next generation of seeds in mature flowers... The ultimate expression of our goal is nothing short of a virtual plant which one could observe growing on a computer screen, stopping this process at any point in that development, and with the click of a mouse, accessing all the genetic information expressed in any organ or cell under a variety of environmental conditions."* [1]

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Convention of Biological Diversity stated that “during the past 50 years we have squandered one-fourth of the world’s topsoil, one-fifth of its agricultural land, and one-third of its forests...” [2]

- What’s left of the soil is being contaminated with pesticides and toxic industrial wastes.
- As compared to 1950, the food we eat today is substantially lower in key nutrients such as protein, calcium phosphorous, iron, Vitamin B2 and Vitamin C. [3]
- 70% of all ecosystems worldwide are in decline and species become extinct at up to 1000 times the normal rate. [4] Approximately 60% of the benefits that the global ecosystem provides to support life on earth (such as fresh water, clean air, and a relatively stable climate) are being degraded or used unsustainably. [5]

In the 1960s James Lovelock proposed the idea that the earth itself is a giant living being, which he called Gaia after the Greek goddess who drew the world from chaos. [6] He subsequently published many books and articles on this topic, with his theory gaining increasing support as scientists begin to unravel the causes and potential remedies for climate change. Other scientists describe the earth as “a biosphere that functions as a single organism with mechanisms of self-regulation of climate and various cycles” [7] or as “one continuous enormous ecosystem composed of many component ecosystems”. [7]

All of these concepts agree on one thing: that our species exists as part of – and because of – a great interdependency and perhaps even collaboration between species. This does not exclude the notion that humans may have “superior intelligence”, or “domain over the earth”, but it definitely puts a different spin on it: our superior rights would then come attached to superior responsibilities. In Nature relationships are not akin to pyramidal power structures, but inter-linked and synergistic, where each individual as well as the local and global environments affect each other. In corporate terms we might describe it as a cooperative, or a partnership, but with life or death consequences. From this perspective destroying the very structure upon which everyone’s survival depends is simply insane.

The human species didn’t intentionally set out to destroy this planet and itself in the process: these are the results of actions based on simplistic assumptions. Even the old saying “if you keep doing what you’ve always done, you’ll keep getting what you’ve always got” no longer holds true. It’s time for a change.

It’s time to ask some new questions. Every scientist knows that the question directs the answer.

For instance, a farmer’s practices will differ depending on whether he or she asks “how can I make a living off this land?”, or “how can I meet my needs by increasing the biodiversity and optimizing the overall health of this land?”

And it is the same with the home gardener who asks “how can I make this yard look pretty?” or “how can I turn my garden into a vibrant and beautiful ecosystem?”

If our actions are to be inclusive and supportive of Nature’s needs,

then we must already integrate Nature's needs into our questions. We need to think in terms of "we" instead of "me". We need to deliberately set out to cooperate rather than exploit. This will be a big change for a society where individual and corporate rights are disconnected from social and global responsibility. Perhaps we need a Bill of Planetary Rights that includes all living organisms! So what lies ahead?

All change starts with intent. Those who regularly write down their personal goals or visualize desired outcomes have already experienced the power of thought. Intent sets in motion a whole chain of events, like a commitment to marriage or a partnership agreement. Perhaps we can start by intending to cooperate with Nature to make this planet - or our little piece of land - a healthy and prosperous place for all its inhabitants.

Next, as those of us who have partners or children know very well, cooperation requires communication. Isn't it ironic that we so easily attribute superior intelligence to extra-terrestrial beings, yet consider plants to be mere mechanical contraptions that can be understood and manipulated through computer models. If we are to communicate with Nature we must accept that there are intelligent beings on this planet besides the human species. It may be a while before we can all consciously communicate with them, so let's at least start by acknowledging them and understanding their roles in our ecosystem.

And finally we need to construct a new conceptual framework that acknowledges the interdependencies within Nature.

This book is a step in that direction.

Science has not stood still over the last 100 years or so, but our research has become so fragmented into different specialties that we have a million puzzle pieces of a multi-dimensional picture without an image of the whole. Or perhaps one should say that we have way too many pieces that simply don't fit our previous conception of what the image should look like.

When solving a puzzle it is often helpful to first build as much of the outside frame as possible. Then one can sort the rest of the pieces into related themes and patterns and start fitting the pieces together. That's what we'll do in this book as well. The first chapter represents the beginning of a global frame, and as we go along we'll complete sections of the picture and add to the framework. Eventually a big picture will emerge, and the contribution of each section to the whole will become clear.

The information presented here is by no means complete - that would be impossible! Volumes have been written on each of the topics, and each of the chapters in the book could be a full university degree program. My intent has been to simply paint a big picture. To that effect I have taken critically important information from many disciplines and explained how it relates to the whole. In the end we may find that the big picture is not quite complete, and certainly much research still needs to be done.

The book is divided into two parts:

- Part I describes some basic relationships and interdependencies within Nature. Here we talk about the relationships

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between organisms and their environment, the soil ecosystem, and water dynamics within ecosystems. These are inseparable and so fundamental that they must form the basis for all our land management practices.

- Part II further integrates these concepts and explains how they translate into specific soil and water management practices, and then pulls it all together to discuss the concept of landscape health management.

It's best if you read the book from front to back, as the knowledge builds. Once you know how the information fits together you'll be able to come back and review individual sections, and use the book as a resource to help you solve specific landscape problems.

Enjoy!

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