

PREFACE

If we teach our children only what we know,
they can never do better than we do.

— GUNTER PAULI

In the 1980s when I read the books of Lester Brown and his team at the Worldwatch Institute, I had the urge to make available to everyone this wealth of data concerning global environmental issues. The onslaught of negative statistics and trend analyses, based on data assembled in Washington DC, showed only a few positive lights on the horizon. Consequently I created a dedicated publishing company to bring the *State of the World* and *Vital Signs* to a recalcitrant listener: the business community in Europe. As an entrepreneur who had established a half-dozen companies by then, I was also a concerned citizen. In the early 1990s with the arrival of my two sons, Carl-Olaf and Laurenz-Frederik, a reflection crossed my mind as happens with so many young fathers and mothers: we want to leave the world to our children in a better condition than we received it from our parents. As my first sons graduate from high school nearly two decades later, I must confess it seems a Herculean task.

However, as life matures and wrinkles unveil deep concerns, we cannot simply remain concerned citizens, worried about the future, sorry about every error. Rather we must regroup and find ways to create the foundation on which we can allow the next generation to surpass our achievements. Perhaps the greatest freedom we can offer our children is to allow them to think differently and, more importantly, to act differently. It is therefore helpful to reflect on what we can bequeath future generations as a structure for positive thinking and a platform for concrete action. This is perhaps the

greatest challenge. The bad news is not only about the health of our planet. For the first time in decades we are realizing that the economic system is also crumbling.

As an early member of the Club of Rome, the informal gathering of concerned policy makers, scholars, business leaders, and international civil servants, I know all too well the importance of sounding a wake-up call. The *Limits to Growth* report put forth by the Club of Rome clearly delineated the vicious cycle of population explosion, environmental degradation, unbridled industrial growth, and collapse of ethical standards. As a publisher of the Worldwatch *State of the World* in selected European languages, and as an avid participant in the Club of Rome for three decades, I could never separate the negative conclusions from the need for positive action.

I began working with Ecover, a Europe-based producer of biodegradable cleaning products. When even the largest manufacturers adopted our biodegradable ingredient – the fatty acids of palm oil – as an industry standard replacement for petrochemical surfactants, it dramatically increased demand for this alternative. This spurred many harvesters, especially in Indonesia, to replace vast swathes of rainforest with palm tree farms. In destroying the rainforest, much of the habitat for the orangutan was also lost. Thus I learned to my chagrin that biodegradability and renewability do not equate with sustainability.

In my first article on the subject, published in Seoul, Korea in 1991, I exhorted the industry to emulate the efficiency of ecosystems. The wisdom of an ecosystem is not just that it provides services like fresh water and clean air, replenishment of topsoil, balanced control of bacteria, and a never-ending evolutionary pathway, always searching for better solutions and higher efficiencies. Ecosystems are also an inspiration for changing our highly wasteful production and consumption model. The article suggested that sustainability is only foreseeable when our system eliminates the concept of waste, and starts cascading nutrients and energy as nature does.

After the disenchanting experience with Ecover, I was challenged by Prof. Dr. Heitor Gurgulino de Souza, the Rector of the United Nations University hosted by the Japanese government, to model an economic system that generated no waste and no emissions, yet created jobs, contributed social capital, and did not entail a higher cost. I accepted this challenge three years before the Kyoto Protocol was approved. Thus I had the opportunity to imagine, from an academic ivory tower, how we could emulate the productive and evolutionary interactions of natural ecosystems where waste for one is food for another. Following three years of research, and in cooperation with the United Nations Development Programme, the ZERI Foundation was established in Switzerland with its sole objective to implement pioneering cases that could demonstrate a scientifically feasible and economically viable model of production and consumption.

Celebrating the first decade of pioneering around the world, the Board of ZERI commissioned an inventory of innovations inspired by natural systems. Although the starting point was nothing more than assembling peer-reviewed, publicly accessible scientific literature, it quickly evolved from a romantic and fascinating search for the brilliance in each species that dramatically enriches biodiversity, to a quest for an economic model that could inspire entrepreneurs to put humanity in general and its production and consumption in particular on a viable and sustainable path. At the outset of this search I had the opportunity to work with Fritjof Capra to edit the book, *Steering Businesses towards Sustainability*. This project triggered a deluge of ideas. I realized that my search for a next generation of business opportunities was based on the conviction that if I could portray the models I envisioned, it might inspire others to become entrepreneurs. The review team ploughed through and annotated thousands of pertinent articles in English-language scientific publications. These were complemented with similar Spanish, German, and Japanese publications. My task was to sift through one after the other and imagine which one of over 3,000 cases would present an opportunity to move industry and commerce toward sustainability independent of subsidies or tax breaks. I pondered which innovations could be bundled into a system that could

work the way ecosystems do, clustering innovations developed by diverse players, making a more efficient use of all the existing, unfailing forces described by the laws of physics for which there are no exceptions.

As an entrepreneur who embraces innovation, I submitted a shortlist of 340 technologies to a team of corporate strategists, expert financiers, investigative journalists, and public policymakers. This exercise happened prior to the current recession, while the world was still building castles in the sky with money that did not exist. Over a period of two years I met with inventors and entrepreneurs in all four corners of the world. I held dozens of meetings with financial analysts, business reporters, and corporate strategy academics. This helped sharpen the logic behind the ultimate selection of the 100 most remarkable innovations cataloged in Appendix One. Then, the recession hit. At the end of 2008 when the United Nations announced that the collapse of the financial markets had cost developing countries over 50 million jobs, a sense of realism emerged. I could find no satisfaction in matching a captivating photograph to a scientific explanation. I needed to communicate something more than the inspirational brilliance of every species we had examined.

A new team undertook a complete reassessment of all the information before us and examined the dynamics of the current economic model's demise in the light of the innovations we had cataloged. We spotted the phoenix of new growth that seemed to shift the logic of short-term results and bonuses to one that gives a world constrained by limited resources the ability to respond to people's basic needs with what we have. I saw a clear model emerging that could offer entrepreneurs around the world a unique window of opportunity to change the dominant business paradigm. It was not about cloning and genetic manipulation, protected by patents that appear closer to bio-piracy than actual innovation. It was about the pervasive logic and sensibility of ecosystems. This short list of 100 innovations drew inspiration from the ability of ecosystems to always evolve to higher levels of efficiency, to cascade nutrients and energy, to leave nothing to waste, to utilize the abilities of all contributors, and to respond to the basic needs of all.

Such insights into ecosystems logic have crystallized into the underpinnings of this book, allowing me to establish the framework for a Blue Economy and to realize that the current economic upheaval is a blessing in disguise. It may be that we are finally calling a halt to the unrealistic consumerism that has propelled the economy into insurmountable debt. Exhorting consumers to spend more is a stereotype of the blind logic that cajoles citizens to buy their way out of crisis by indebting all of us as well as subsequent generations, beyond our capacity to ever repay. This unconscionable approach siphons the entire world's liquidity into an elite "bankonomy," denying credit for everyone else. Such actions are at the base of a bankrupt economic model, a Red Economy model that borrows – from nature, from humanity, from the commons of all – with no thought of repayment beyond postponement to the future. Insatiable economies of scale callously search for ever lower marginal costs for each additional unit manufactured, making dismissive abstraction of all unintended consequences. The financial crisis of 2008 stemmed from bankers and corporate decision-makers embarking on a merger and acquisition frenzy, leveraging assets and amassing such enormous debt that the growth became self-defeating. Such is the tale of an "In-the-Red" (debt) Economy that failed.

In comparison, a Green Economy model has required companies to invest more and consumers to pay more, to achieve the same, or even less, while preserving the environment. While this was already a challenge during the heyday of economic growth, it is a solution that has little chance in a time of economic downturn. The Green Economy, in spite of much goodwill and effort, has not achieved the viability so greatly desired. If we shift the spectrum, we see that a Blue Economy addresses the issues of sustainability that go beyond mere preservation. A Blue Economy engages regeneration. We might say that the Blue Economy is about ensuring that ecosystems can maintain their evolutionary path so that all can benefit from nature's endless flow of creativity, adaptation, and abundance.

It is the young at heart who will seize upon the entrepreneurial opportunities that emulate ecosystems and cascade energy and resources to add value

and generate multiple exchange benefits, translating them into income and employment. When we implement the concepts of a Blue Economy, the decisions of millions of actors can supercede the *dirigisme* of a few market makers, monopolistic companies, or state controls, and a powerful new social and economic structure manifests. The engagement and commitment of citizens is what will change the rules of the game and what will effect a real shift. At a moment in history where peak oil and peak food are clearly hovering, we can draw practical ideas and inspiration from ecosystems as we witness their ability to apply creativity and evolution in overcoming challenges to survival. This book aims to contribute to the design of a new economic model that is not only capable of responding to the needs of all but converts the artificial construct called “scarcity” into a sense of sufficiency and even of abundance.

While the waste of material resources exemplified by modern landfills and incinerators is to be deplored, the waste of human resources is absolutely unacceptable. When the numbers of unemployed youth oscillate between 25% in industrialized countries and over 50% in the developing world, it is easy to imagine what it means to our global society if its leaders consider the next generation useless – or even worse, if the young and disadvantaged consider themselves useless. It is indicative of a system in severe decline, a society in extreme crisis, underscored by mounting statistics of violence, criminality, terrorism, drug abuse, illegal immigration, relinquished education, and the deplorable treatment of populations or communities already at-risk or underserved.

Abdul Samer Majali, who served as President of Jordan University as well as Prime Minister, once said, “*Expose – do not impose.*” If our aim is to create a better world for all, not just a fuller bank account for a few, if we are prepared to counter risk with gain, then thoughtful considerations, based on solid science and documented illustrative cases, can help us envision and achieve it. A strong platform for entrepreneurship could emulate the success of ecosystems in eliminating waste and achieving full employment and productive capacity. Multiple small initiatives around the world could

provide the basis for new entrepreneurial opportunities that would permit the shift to a macro-economic system. Instead of deferment as policy-makers reach agreement, the direction we take is to expose individuals everywhere to the open-source opportunities provided by nature.

It is amazing how little natural logic there is in modern society. To cool a building, air-conditioning experts pump cold air “up”? To clean water we dump chemicals in it to kill all life? Greenhouses heat the air, not the roots? We pay upwards of \$100 per kilowatt hour for electricity provided by a battery that toxifies our environment? When we drink a cup of coffee we give value to only 0.2% of the biomass while the rest is left to rot, generating methane gas, or stressing earthworms, who suffer as much from the neurotoxin called “caffeine” as we do. A hundred thousand tons of titanium, mined and processed at high temperature, are flung into landfills when we “discard” our “disposable” razors. Humanity makes excessive use of energy, emits greenhouse gases beyond reason, and causes havoc in the environment. We can hardly be surprised that we face climate change. Indeed, the only excuse for what we do and the way we do it is that we are ignorant about unintended consequences. Once we know, we not only have the clarity needed to change, we are also empowered to consciously make it happen.

Chido Govero, an orphan who lost her mother at the age of seven and never knew her father, turned immediately from a young girl to the head of her family with the responsibility to provide food for her grandmother and little brother. Although such tragedy is real, it is far too common. There are millions of people, many of them women and children, who must tolerate abuse to guarantee a semblance of food, water, and shelter. As someone who quickly learned how to survive for years on nothing more than a bowl of peanuts a day, Chido also quickly learned to appreciate the generative capacity of ecosystems. In Africa, these natural systems have been pillaged by the irresponsible farming of settlers who brought their traditions from temperate climates with four seasons, whose techniques not only denuded the land of its natural vegetation but drastically eroded the rich topsoil.

Yet Chido does not judge the errors of the past. She has grasped the opportunity to redefine the potential of coffee-crop agro-waste to achieve food and livelihood security for herself and her fellow orphans in Zimbabwe. Given food and livelihood security, abuse – both of young girls and of natural systems – can be eliminated. Chido's vision is to accomplish this in her lifetime.

What more do you expect to achieve in your lifetime? Do you mind waiting to answer until you have read this book?

Gunter Pauli

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La Miñoca, Columbia