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Book Review — Accepted Manuscript (Postprint)

[Book Review] Daniel C. Esty (Ed.): A Better Planet.
40 Big Ideas for a Sustainable Future, New Haven
and London: Yale University Press 2020

Zeitschrift für Umweltpolitik und Umweltrecht

Provided in Cooperation with:
WZB Berlin Social Science Center

Suggested Citation: Simonis, Udo E. (2021) : [Book Review] Daniel C. Esty (Ed.): A Better Planet. 40 Big Ideas for a Sustainable Future, New Haven and London: Yale University Press 2020, Zeitschrift für Umweltpolitik und Umweltrecht, ISSN 0931-0983, dfv-Mediengruppe, Frankfurt a. M., Vol. 44, Iss. 2, pp. 235-244

This Version is available at:
<https://hdl.handle.net/10419/259521>

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Book review

Daniel C. Esty (Ed.): **A Better Planet. 40 Big Ideas for a Sustainable Future**,
New Haven and London: Yale University Press 2020, 412 pages,
ISBN: 978-0-300-25522-5

„Imagine“ – just imagine, somebody would ask you: „What could be the most important idea to ensure a sustainable future?“ For John Lennon, the answer in his famous song consisted of two big ideas: „We need a brotherhood of man; and the people living in peace“. At this point in history, we have worrisome environmental threats and severe conflicts on the planet; and we have no brotherhood of man, and no peace. That’s what Daniel C. Esty, a professor of law at Yale university, asked 53 American colleagues that question. The final outcome is this book – a book not on 2 but on 40 big ideas.

In the Introduction, the editor starts from a rather pessimistic position. While America has made great strides in the environmental realm in past decades, environmental protection in recent years has become an arena for bitter partisan battles. Although some progress has been made in addressing the most grievous environmental damages, the pace of progress has been drastically slowed. While the theory of pollution control has advanced, the environmental policy practice has not been substantially re-thought. Therefore, the approach to environmental protection needs to be thoroughly changed.

To begin with, Esty is proud to have found an extraordinary group of thought leaders, environmental activists and graduate students – spanning a wide range of disciplinary perspectives, issue expertise, and political beliefs – to present their ideas for re-igniting environmental progress. They were asked to offer concrete suggestions for policy progress, on a basis that could win broad political support. The resulting 40 essays in this volume should provide a menu of innovative suggestions on which the world might build over the next decades – and so make a better planet.

The book has five parts. Part One is on „Nature, Land, and Water“ – indeed a strategic decision. „Sustaining Humans and Nature as One“, that’s the message of the first essay. Ecological science teaches us that conceiving a sustainable future requires the fundamental appreciation that we (human beings) live on a finite planet that supports a grand economy called nature. It is a „circular economy“ that is sustained not by technology but by a variety of technologically irreplaceable plant, animal and microbial species able to fulfill their biological roles – as *ecosystem services*.

However, exploiting natural resources and transforming landscapes stand to diminish human well-being over time by compromising the provision of ecosystem services in that place. For the author, reconciling this conundrum is one of the foremost environmental challenges of our time. Unfortunately, there exist two very different views on this question.

The reigning view is a despairingly stark one: it sees humankind as existing apart from and above of nature. The alternative view imagines the possibility of humankind (the *social*) and nature (the *ecological*) existing together, entwined as a „socio-ecological system“, in which each part requires the other for its existence. Realizing that possibility, however, means humanity to engage with nature quite differently than it now does. „Ecosystem stewardship“ therefore is the basic suggestion of the author: „Humankind ought to ensure the integrity, resilience, sustainability, and beauty of all landscapes, both the human-built and natural alike“ (p. 13).

A similar idea is presented in the essay on „Habitable Earth“. Based on various alarming reports about the state of the global biological diversity, scientists and diplomats have begun to set targets for biodiversity protection. For example, the UN Convention on Biological Diversity suggested that 30 percent of the terrestrial and marine ecosystems of the planet should be put under strict protection by 2030 – known as the „30 by 30 target“. These efforts resonate with earlier visions such as Edward O. Wilson’s „Half-Earth“ proposal, i.e. to set aside half the surface of the Earth for nature.

The author concludes in a different way: The world’s biodiversity will require deepening the public’s understanding of the Earth as a living planet made up of *functional landscapes* – of self-sustaining systems that allow the vast variety of species to thrive, and to secure the necessary ecosystem services. The Amazon river and the Mekong River basin are thought to represent important starting points for thinking seriously about functional landscapes, that consequently need ecological system management, and not just forest or water management.

The next essay presents „A Restoration Agenda for Native Forests“. Before the industrial revolution, native forests covered more than 6 billion hectares, or about 30 percent of the global land surface. Today, only 3.9 billion hectares are left, of them only a third remaining relatively intact. Fortunately, there has emerged a „global call for restoration“, given the growing recognition that forests provide an enormous amount of ecosystem services. But how best to promote the restoration agenda is under hot debate. The authors of this essay plead for better understanding forest diversity and forest succession – and they do so by looking at case examples that illustrate the decisive principles. Unfortunately, the authors neglect the surprisingly positive study, debated worldwide by Jean Francois Bastin et al. on the global tree restoration potential (*Science*, Vol. 365, Issue 6448, 2019).

There are two more essays here, one on „Private Lands“, another on „Stewards of the Land“, but both focus exclusively on the US situation. A broader view is taken by two authors on „Sustainable Intensification in Smallholder Farming“; and they found an impressive title for their strategy: „Toward an Evergreen Revolution“.

An amusing, but serious essay is on „Found Water“. The author reminds us charmingly of the classic 1942 film *Casablanca*, where Rick (Humphrey Bogart) is asked

by the French captain Renault (Claude Rains): „What in heaven’s name brought you to Casablanca?“ „I came to Casablanca for the waters“, replies Rick. Captain Renault responds, „The waters? What waters? We’re in a desert!“. „I was misinformed,“ deadpans Rick. So what, in heaven’s name, has brought so many Americans to live in the desert or in arid regions, like California or the Colorado River basin? Were all these Americans moving west misinformed?

Nowadays, we are better informed about the water stock, current water use, and water shortages. The OECD is regularly projecting long-term global water demand. Its last report showed a possible increase of 55 percent, due to growing demand from manufacturing, thermal electricity generation, and domestic use. Many states and regions of the world have made solid progress in reducing water consumption in recent years. Still, the question remains: Can water utilities keep up with growing population, drought, and climate change?

We must rapidly look for alternatives, the author answers. There are, for instance, new technologies of *water re-use* providing new opportunities of „found water“ in a community’s wastewater stream – and convert it into clean water. In conclusion, there is no longer such a thing as „wastewater“, there is only water that is wasted. As there still are many decision-makers who are misinformed as to what water re-use implies, the author gives a broad overview on the US states and counties active in this field, California included. Unfortunately, a sketch of the global potential of water re-use is not presented.

The last essay in Part One is on „People and the Ocean“. Jane Lubchenco first concedes that a new narrative does not automatically change the status quo, but if widely adopted, it can alter people’s sense of what is possible. This in mind, she presents a fascinating, three-phase historic journey about people’s relationship with the ocean:

People and the Ocean 1.0: The ocean is so vast, bountiful, and endlessly resilient, it is simply too big to fail.

For all human history and well into the late 20th century, the ocean’s size, productivity, and resilience made it impossible for people to ever imagine depleting or disrupting it. The 1960s general political mantra „Dilution is the solution to pollution“ reinforced the notion that anything we put into the ocean could not really affect it. The ocean was a seemingly endless source of food, minerals, oil, gas, and salt. And it was also a convenient repository for all kinds of wastes, for sewage, vehicles, garbage, toxins, military debris, and even nuclear waste.

People and the Ocean 2.0: The ocean is doomed. Massively and fatally polluted, deleted and disrupted, the ocean is too big to fix it.

Over the last few decades, however, the general attitude that the ocean represented an endless bounty and bottomless dump was increasingly questioned. Scientists

discovered that human activities had fundamentally altered its chemistry, biology, and physical structure. One now often sees images of widespread coral bleaching, enormous plastic pollution, and even tumor-riddled sea turtles. In several regions of the planet fishery has collapsed, and illegal fishing threatens the livelihood of millions of people. There is also increasing evidence that climate change is making the ocean warmer, stormier, more acidic, and oxygen-depleted. And in the long term there could be a fast rising sea level, with dramatic consequences for numerous cities and millions of people. What may make these trends even more frightening, is that the situation of the ocean seems impossibly complex, the drivers too ingrained, the vested interests too powerful, and the available political options too limited to make a difference. The common perception often is that the problems of the ocean are so massive and so complex that they are impossible to fix.

People and the Ocean 3.0: The ocean is so central to our future, it is too big and too important to ignore. If we heal the ocean, we can solve multiple global problems and heal ourselves. It is our path forward.

„Like a phoenix from the ashes, hope is beginning to emerge and steer us away from the current dismal ocean narrative“ (p. 74). With these words Jane Lubchenco starts the last nine pages of her essay. These pages are full of facts, figures, and constructive visions – but too voluminous to be presented here in detail. But no doubt, her essay is a must-read, a must-read also for all readers of this review. I personally declare it a master-piece of thought and dedication – and a high-light of this book.

Part Two is on „Innovation and Technology“. Daniel C. Esty in his essay „From Red Lights to Green Lights“ pleads for more innovation-oriented sustainability strategies. He deplores that environmental law and policy as framed in the 1960s and 1970s focused on „command and control“ strategies under which government told business (and individuals) what they should *not* do. This framework, he says, has proven to be incomplete: „It has failed to offer signals as to what society needs business *to do*, including what problems to solve, what research to undertake, and what investments to make“. His conclusion is straightforward; „We need to complement our system of red lights with an expanded set of *green lights*“. The author is clever enough not to condemn red lights but asks to always look for adequate solutions – making red and green equivalent colors, shining in different cases of decision-making. This could make a careful policy design – balancing control *and* adequate incentives – obligatory. When it comes to strictly meet the demands of the „sustainability imperative“, this may indeed be a big idea.

Some of the following essays are examples of the search for optimal technical innovations, others are about the search for innovative policy solutions. There is, for instance, the essay on „Environmental Protection through Systems Design“. The authors deplore that our understanding of the environment has mostly been built on the reliance on „reductionism“: obtaining understanding through observation of what changes take place when modifying a single factor while holding all other factors constant. In practice, that very often ended „in doing the right things wrong“:

Biofuels from food crops was such an example; water purification by hazardous chemicals was another, and so it was with solar panels using toxic metals, etc. While a certain reductionism may be indispensable, integrated systems thinking is thought to be absolutely necessary. To put systems-thinking into practice, the authors give a number of concrete suggestions: Break down the media-based structures in environmental ministries and agencies; establish solutions orientation; use new tool boxes; collaborate across agencies.

Because they are rather complex, I pass over the essays on „Genomics“ and „An App for That“. The essay on „Reimagining Solar Fuels to Power the Planet“ is very speculative; the essay on „Fostering Energy Innovation for a Sustainable 21st Century“ sounds more realistic, but the author is just following one fixed idea.

The next essay seems more promising. It's on “Building Climate Change Resilience by Design“. At first, it seems to be on climate change, the currently most debated environmental topic; and second on resilience, the most debated adaptation topic of the current Corona pandemic. However, the author has a quite specific focus: She talks about the „built environment“, especially the material infrastructure, and she wants to make it resilient. This shift in perspective she believes would be rather „green“: „Back to nature – using history to guide future development“ is the first suggestion; „Imagining green schools“ is the next; followed by „building floodgates into infrastructure“, and „integrating water into urban form“. The sad point in this story is, that if climate change develops as projected, and the sea-level is rising as expected, the proposals made would come very close to last-minute disaster management.

The last essay in Part Two is on „Bracing for Impact. Transforming the National Weather Service for the Climate Change Challenges Ahead“. The number of articles on the difference between weather and climate goes into the millions. But the chance to make a weatherman into a climatologist is very low. Reason being: weatherpeople like their jobs very much because they are asked for news every day, and that is not so with climatologists. Still, a good point is made here: „The United States is weather-ready“, but the „United States is not climate-change-ready“ (p.146).

Part Three of the book is on „Law and Policy“; it has eight essays, some highly expected, but one a big surprise. „Building Public and Political Will for Climate Change Action“, no doubt, is a major task in all parts of the world. The author calls it a „massive collective action problem“, and declares the „public will“ expressed through citizen action as the most important influence on the policy-making process. He sketches the conditions for „windows of opportunity“, mentions the different public forums within a population and their motivations to reduce global warming, applauds traditional environmental groups like the Sierra Club or the Environmental Defense Fund – but finds no words of empathy for the young generation and the globally active „Fridays for Future“ movement.

„Broadening Action on Climate Change“ is an essay on the strengths and weaknesses of the Paris Agreement on climate change of 2015 – the weaknesses prevail. The author therefore looks at the possibilities of other international regimes to „help out“: most significantly, the Montreal Protocol, and The World Trade Organization, but also sectoral regimes like the International Civil Aviation Organization, the International Maritime Organization which have started making (somewhat) „greener sectors“. Regarding financial assistance to developing countries, the picture is mixed. The „Green Climate Fund“ had a rocky start, but is now about to deliver funding for both mitigation and adaptation measures. However, the author is right in saying that this type of funding, in contrast to the high promises made, is but a „drop in the bucket“ compared to the overall international financial flows that need to be „greened“.

A more drastic reform of climate policy is presented by William Nordhaus, the Nobel Prize winner of 2018, in his short, two-page essay on „International Carbon Pricing“. The most effective incentive for change in his view is a high price for carbon. As a means of projecting carbon pricing into the international space, he proposes a „climate club“. The notion is that one can overcome the „syndrome of free-riding“ by adopting the club model rather than the voluntary, nationally determined contributions (NDCs), as foreseen in the Paris Agreement. A climate club is an agreement in which nations would be penalized if they did not meet their obligations. Unfortunately, the international community is a long way from adopting the strict climate club model; most discussions are still focused on the doomed voluntary model.

In this part of the book there are some more interesting essays, such as „The Role of Climate Change Litigation“ and „Deploying Machine Learning for a Sustainable Future“, but I would like to leave those to the discreet reader. Instead, I must refer to an essay that was a great shock to me: „The Case of Fracking“.

Its author, an expert on hydrology, cites science as his foundation for policy advice. On basis of his private engagement in establishing the fracking industry in the state of Pennsylvania, he blows the trumpet for more fracking in the future, and in other regions of the world. He seems to know the manifold environmental effects of that technology very well, but is of the opinion that everything can be handled on the basis of careful use of given science. His real problem, however, is different, and concentrated in a sentence he uses as his private mantra: “We may be stuck with oil and gas – and the technologies that produce them – for the foreseeable future“ (p. 219). No, Sir, we need not be stuck – alternative science is here, and alternative technologies exist, to free us from self-inflicted intellectual prison.

Part Four is on „Resources, Economics, and Sustainable Business“, with six essays. The text on „Next-Generation Corporate Sustainability Leadership“ reflects on the American history of non-regulatory pathways to progress, the promise, today, of stronger accountability between investors and corporations, the need to transform whole sectors, and to secure the next generation of innovative regulatory and governance frameworks. While today’s shareholders and investors increasingly expect

early disclosure of long-term risks due to climate change, and more regularly discuss the issues of emerging environmental risks, the author, in turn, expects corporate leaders to increasingly disclose the long-term risks of climate change and environmental damage, with „sustainability committees“ providing credible oversight, and to work pro-actively to secure governance systems to reduce their business risks, and the risks to society at large. Is this „wishful thinking“ – or future reality?

„Making Companies Work for Society“ is a closely related essay. Over the last 50 years, the perception of the role of companies had shifted strongly toward a vision of companies as agents for wealth generation, more specifically, wealth generation for their shareholders. This notion of *shareholder primacy* gained enormous traction in the 1970s when Milton Friedman argued that a corporate executive is „an agent serving the interests of his principal“. Shareholder primacy stands, no doubt, in stark contrast to *sustainable finance*. The tension between these two models is a result of two trends: First, there is growing awareness among companies that they need to address not only social but also environmental challenges. Second, there is growing awareness that shareholder primacy increases the gap between the wealthy and the poor. Given these basic positions, many commentators write off sustainable finance as a „dream“. In contrast, the author believes that due to internal and external factors we are quite close to a decent „system of sustainable finance“.

While this topic still seems to be a bit speculative, the next essay comes down to earth: „Waste and Materials Management“. Most Americans have grown up with three waste management principles: “reduce, reuse, recycle“. Yet, over half of what is generated in homes and businesses today still ends up in landfills. In the future, waste and materials management should therefore seek to preserve, rather than throw away, the materials and energy that go into the products used. Fortunately, there are many environmentally friendly firms pioneering new material management strategies and models that create value through re-use, repair and re-manufacture. Achieving a better recycling and waste disposal would translate into significant benefits for the health of humans, and of nature. Unfortunately, the author fails to present a strong conclusion to his own thinking: a promising model of a „Zero Waste Society“ – for America, and the World.

The next essay comes close to the title of the book. The question is: “Can we Define Planetary Boundaries on the Human Use of Materials“? If not, we should try. The author first refers to the work of Johan Rockström et al. who, in 2009, proposed the concept of „planetary boundaries“. Their focus was on the planet’s biophysical sub-systems, and so they defined boundaries for several global metrics, such as greenhouse gas concentration, water use, and biodiversity loss. They then delineated a structured progression of three steps to evaluate human impacts on the environment: „safe operation space“, „zone of uncertainty“, and „zone of danger“. This concept quickly captured the imagination of the science community, and actively stimulated the debate in global environmental politics.

With this as starting point, how might that concept be applied to the ever increasing human use of materials? The author suggests as first task, choosing the materials (and material groups) important for human activities, identifying potential rates of demand over time for those materials, and specifying „safe operating demand“, „zones of uncertainty“, and „thresholds of high-risk demand for each“. The intent of this intellectual exercise is to define levels of materials use that are sustainable over the long term, while simultaneously permitting progress toward realization of the UN-initiated „Sustainable Development Goals“ (SDGs).

Right away, the author establishes a list of „potentially critical materials“, containing six groupings, including (a) the materials used most widely, (b) those with lower use rates but that appear crucial in enabling sustainable technologies, and (c) those for which processing and product fabrication result in heavy environmental impacts. The author instantly realizes that this is not only a „big idea“, but also requires a complex research strategy. He ends with some strong words: “Given anticipated trends in economic growth and its high materials dependence, establishing planetary boundaries for materials would seem to be imperative“ (p. 265). Is this simultaneously, the reviewer would like to ask, the way to reduce the „ecological footprint“ of industrial man and toward a sweeping „de-materialization“ of economy and society? The author, unfortunately, does not take up this question – and so misses another „big“ idea.

Part Five of the book, the final one, is on „Society, Equity, and Process“, with ten essays. It is the longest but for me the weakest part of the book. In some of the essays it’s difficult to find out whether the ideas presented could really be „big“ at all; others are at least interesting to read. Therefore, with a short overview I will try to find some „big“ ideas and, if not successful, will point to the missed chances.

What is „Hip-Hop Sustainability“? It could perhaps be a big idea, if there were many hip-hoppers around. Is that to be expected? „Driving Systems Change through Networks“, that is indeed important and exists already in many forms. But how is it that „Fridays for Nature“ is not quoted here as one of the globally successful networks? „Moral and Spiritual Contributions to a Flourishing Earth Community“ that, at least theoretically, is a big idea, when thinking of Pope Francis, but not of the Catholic church; Buddhism could also be one, when thinking of the Dalai Lama, but not of the current (buddhist) military rulers in Myanmar. In the US, „Dark green religion“ has been growing fast, but this movement is not dealt with here. „Environmental justice“ is a big idea, no doubt. But is it really relevant for public health science or for environmental protection? On a threatened planet „Preparedness for Natural Disasters“ should of course get high priority, no doubt about that. Most cases of serious environmental problems are created in urban areas, and therefore re-imagining the city (and its parks) are in full swing, recently under the imaginative heading of „Resilient City“. In this essay, literature on these activities is missing. And then there is the essay „From Static to Adaptive Environmental Policy“, which I found somehow disturbing. No doubt, there are many powerful blockers and many actual blocks in practical environmental policy, but I have always found environmental

policy as being „on the move“. I am even tempted to say, that there is no other field of politics that is as flexible as this one. And that is so because environmental consciousness of the people is growing day by day.

„Why Big Ideas so Often Fail“ is the last essay of the book, essay Nr. 40. Astonishingly, it is written by three youngsters. This I found daring, but very interesting at the same time. I could agree to nearly every point made, and there even was a statement which I really loved: „Big ideas, by their nature, rally attention to urgent problems of seemingly universal significance. Their scale and audacity make them compelling – but also vulnerable to failure. The best way to avoid pitfalls is to be aware of them and plan for them in problem diagnosis, project design, and implementation“ (p. 367).

In the final part of the book I had expected some more specific contributions on where the American society, where individual countries, and where the international community stand – and where they should go. In practical environmental policy there are forerunners, latecomers, laggards, and those blocking any progress. Why is this so, and what would be needed to make progress? On the international level, an early milestone of environmental policy was the establishment of the United Nations Environmental Programme (UNEP) in Nairobi, 1972. The second and major milestone was the United Nations Conference on Environment and Development (UNCED) in 1992, with the „Rio-Declaration“ of 27 important principles, the „Agenda 21“, the establishment of the Commission for Sustainable Development (CSD), and the subsequent installation of three UN-Conventions: on Climate, on Biodiversity, and on Desertification. The global forestry problem at that time was also on the UN agenda, but till today remains „un-finished“ business.

The United States of America (USA) never made close friends with these UN environmental activities, but these activities still exist, have some, though different success, are important for international understanding – and should be developed further. In a progressive book by American authors one would have liked to read something on these UN activities – including the question of how to transform the rather weak UNEP into an effective World Environment and Development Organization (WE-DO). Vastly neglecting the United Nations when on the way toward a better planet is not a good idea.

Some final remarks: The readers of this book (and the readers of this rather long review) might ask whether the story of „a better planet“ could not have been told in quite a different way. Well, a lot could be said here and many books be quoted as proof. To make the answer short and private, I would like to present a personal view: my own ideas for an environmentally sound, sustainable future – not in form of two fundamental ideas, as John Lennon once proposed, but in form of four strategic global transformation projects.

Taking into regard UN General-Secretary Antonio Guterres‘ recent declaration: „The state of the planet is broken“, it seems to me that there is, first, strong need for

a comprehensive Re-Naturalization of Planet Earth. There is, second, the need for an extensive De-Materialization of economy and society to respect planetary boundaries and to prevent physical collapse. There is, third, the need for a drastic De-Carbonization of the energy systems to prevent climate catastrophe. And as all this needs sweeping system change there is, fourth, a strong need for a peace-devoted Earth System Governance.

To a certain extent, this 4-projects-focus on the issue of global sustainability is reflected in several of the 40 ideas presented in this book: On re-naturalization as its best in Part One. On de-materialization I found nothing particular, and on Earth system governance nothing specific. In contrast to these deficits, on de-carbonization there were many interesting and highly relevant essays; the most challenging one for me was William Nordhaus', who doesn't trust the voluntary, nationally determined contributions of the Paris Agreement on climate change, and favours instead a strictly ruled „Carbon Club“.

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