



Scientists Reporting: Top 25 Recent Online Reports on the Global Environmental Emergency

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Abstract

Earth scientists and biologists have much to say about the changing state of nature. Many of them join together in important collective reports, available free online, but too often ignored. It may well be even more powerful to assemble brief information on an array of these scientists' reports. To illustrate, abstracts of some two dozen reports, nearly all published in 2018 or 2019, are arranged in six categories: 1) Climate, Health, and Energy (IPCC, ICIMD, IEA, etc.); 2) Land and Seas (IPBES, IUCN, NOAA, etc); 3) Biodiversity, Food, and Water (IPBES again, WWF, FAO, UNESCO); 4) Agendas for Action (SDSN/SDGs, SRC/CoR, GCAS, IRC); and 5) Overviews (UNEP, WEF, GCF). Concludes with several questions raised by this exploratory exercise.

The information revolution in recent decades has produced floods of knowledge, opinion, disinformation, and entertainments in many new formats. Who should we consider for evidence-based thinking about the complex world we live in? Scientists,[†] of course, even though they may sometimes disagree. Even more important are carefully vetted reports from large groups of scientists. And still more important, arguably, is a survey of some two dozen recent reports[‡] that are readily available online.

Generally, these free reports from major organizations concerned with urgent environmental issues are handsomely produced, amply documented, and clearly written. Most of these reports run into hundreds of pages,[§] and are evaluated by scores and sometimes hundreds of scientists, and nearly all of them have executive summaries.

But most scientists' reports get little or no attention in the media or academia. Many journalists do not know of these reports, or describe them only briefly. Most of academia is still devoted to creating original bits of knowledge in journal articles and occasional books,

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† "Scientists" are defined here in the conventional usage of natural, physical, or "hard" sciences.

This excludes the "soft" social sciences, the humanities, and the professions, where scholarship is often as rigorous, although sometimes influenced by ideology or individualistic flourishes. A more important distinction is that natural scientists are prone to working together, as illustrated by the reports reviewed here and important journal articles with multiple authors, sometimes in the dozens.

‡ Apologies are due for the squishy count of reports. There are 25 "primary" reports (one of them in two parts) and 8 "secondary" but related reports that are added on and briefly discussed.

§ This survey includes 11 reports over 450 pages, including two that are over 1,500 pages.

while ignoring the “gray literature” category of new online reports that summarize the best of scientific thinking on “wicked” existential problems. Book reviews are confined to fiction and non-fiction books, usually in hardcover. Admittedly, one does not give a climate change report as a Christmas gift, or choose it for summer reading at the beach. This is serious non-fiction, but it should be accessible to any and all who might be interested.

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The blame for obscurity is not entirely on the media, academia, government, or a disinterested general public. Nearly all recent science reports include a summary that is quite adequate for most potential readers. A few reports even summarize the summary, e.g. the IPCC “Headline Statements.” But outreach stops at this point, instead of seeking new forms of dissemination to promote the necessary science-based transformation to sustainability.

Every year brings hundreds of new reports from hundreds of organizations, some more important than others. Any one report viewed alone does not do justice to the growing global emergency of too many people inflicting costly harm on the environment in too many ways, despite many efforts at mitigation, resilience, conservation, and developing new technological remedies.

A listing and brief discussion of recent scientific reports can help to focus attention on the general problem. A “Top 10” would seem adequate, but does not do justice to the many facets of the global environmental problem, or the many excellent recent reports, i.e., of the 25 reports identified here, more than two-thirds were published in the past year. With one exception,* all of them are collective efforts, and most of them solely by concerned scientists.†

1. Climate, Health, and Energy

Nearly everyone worried about global warming knows about the UN-sponsored Intergovernmental Panel on Climate Change, the authoritative agency in Paris that assesses climate change and its impacts, based on work by hundreds of scientists. Their recent offering, **Global Warming of 1.5 °C** (Special Report, Oct 2018; 26p Summary and 3p Headline Statements), describes potential impacts and risks of 1.5 °C vs. 2.0 °C warming above pre-industrial levels, summarizing over 6,000 studies. It concludes that, at current

* The single exception to these collective reports is *A Farewell to Ice: A Report from the Arctic* by Peter Wadhams, who has as much of importance to say—and more—than the two other Arctic reports reviewed here. See review in *CADMUS*, 3:3, Oct 2017, 165-166.

† The Agendas for Action and the two Overviews on global risks are largely authored by economists and other social scientists, although certainly based on what “hard” scientists have written.

rates, “global warming is likely to reach 1.5 °C between 2030 and 2052,” with severe risks (in order of importance) for corals, the Arctic region, small-scale fisheries, coastal flooding, and terrestrial ecosystems. Future risks can be reduced by accelerating coastal hardening, efficient irrigation, sustainable water management, etc. Four scenarios illustrate rapid and far-reaching transitions in energy, land, buildings, transportation, and industrial systems. The IPCC’s history as a focal point of climate change assessment ensured widespread mention of this special report, far more so than any of the other reports listed below. But many others are equally important—and more readable.

The **Fourth National Climate Assessment**, a massive two-volume effort from the U.S. Global Change Research Program, was mandated by the U.S. Congress, and thus escaped the head-in-sand climate change denial of the Trump administration. **Volume 1: Climate Science Special Report** (2017, 470p; 23p Summary), provides a non-technical overview of US and global climate change—past, present, and future—with projections and scenarios of temperature and precipitation change, drought and floods, extreme storms, Arctic change, sea-level rise, and potential surprises.

Volume 2: Impacts, Risks, and Adaptation in the United States (Nov 2018, 1,515p; 86p Report-in-Brief with 8p Summary) provides an excellent survey of economic and social areas that will be increasingly imperiled, as well as a detailed assessment of projected changes in 10 U.S. regions. Growing impacts and risks are described for water and energy supply, land use, forests, ecosystems and biodiversity, oceans, high tide flooding of coastal areas, agriculture and rural communities (productivity decline expected, especially in the Midwest), built environment and cities, infrastructure and property losses, transportation, air quality, threats to human health, threats to indigenous peoples, U.S. international interests, and sector interactions. Although Volume 2 is limited to the U.S., the framework for assessing rising costs of climate change, and where encountered, could be applied to any large country or region.

On the other side of the world, **The Hindu Kush Himalaya Assessment: Mountains, Climate Change, Sustainability, and People**, from the International Centre for Integrated Mountain Development (Kathmandu, Nepal; Jan 2019, 627p; 61p Summary from www.icimod.org) offers a different but no less concerned approach. The HKH region extends over all or part of 8 countries, encompasses 1.8 billion people—nearly six times the U.S. population—and is the source of 10 major river systems. This extensive and highly detailed regional report provides scenarios and proposals to meet the UN’s Sustainable Development Goals for the endangered area, which is likely to see a major decline of water depending on the degree of warming. The **Downhill Scenario** warns that the Himalayas could warm by 4.4 °C and lose two-thirds of its glaciers, bringing major disruption to food and water supplies. The **Business as Usual Scenario** assumes that climate change mitigation does not meet the 1.5 °C IPCC target. The **Prosperity Scenario** envisions large-scale sustainable development investment, with regional, national, and local cooperation.

An especially worrisome report appears in Britain’s premier medical journal, warning that public health gains of past decades are being reversed and offset by climate change.

Lancet Countdown: Tracking Progress on Health and Climate Change (*The Lancet*, 28 Nov 2018), was prepared by 150 experts from 24 academic institutions and UN agencies, who tracked 41 indicators across five domains: 1) climate change impacts, exposures, and vulnerability; 2) adaptation, planning, and resilience for health; 3) mitigation actions and health co-benefits; 4) financial aid economics; and 5) public and political support. It concludes that extreme heat, drought, and floods will continue, leading to more infectious diseases, lost labor, and diminished crop yields, and advocates a “global transformation for public health.”

To deal with climate change, a major—but by no means only—response is to accelerate the transition from fossil fuels to non-polluting and renewable sources. But it is no easy matter, as shown in great detail by the “gold standard” of long-term energy analysis: the annual report of the International Energy Agency, an independent arm of the OECD in Paris. **World Energy Outlook 2018** (Nov 2018, 650p; 6p Executive Summary) describes global energy trends, energy and the Sustainable Development Goals, and scenarios for oil, natural gas, coal, energy efficiency, renewables, and growing dependence on electricity. Three overall scenarios are provided. The **Current Policies Scenario** leads to increasing strains on almost all aspects of energy security. In the **New Policies Scenario**, a rising tide of electricity, renewables, and efficiency improvements stems growth in coal consumption, and oil use for cars peaks in the mid-2020s. But trucks, planes, ships, and especially petrochemicals keep overall oil demand rising. The share of renewables in the power mix will rise from 25% today to around 40% in 2040. The **Sustainable Development Scenario** accelerates clean energy transitions with an integrated strategy to achieve energy access, air quality and climate goals, and carbon capture, utilization, and storage. The share of renewables will rise from 25% today to two-thirds in 2040. The share of generation from nuclear plants will stay at around 10%.

2. Land and Seas

Many people concerned with environmental issues know of the IPCC. But very few are aware of the equally important Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (www.ipbes.net). Their **Assessment Report on Land Degradation and Ecosystem Services** (2018, 686p; 44p Summary) is a powerful eye-opening work by 184 authors, summarizing some 4,000 sources. Land degradation—a pervasive, systemic phenomenon in all parts of the world—is a major contributor to climate change. Current degradation of some 12 million hectares per year, notably desertification, “is negatively impacting the well-being of at least 3.2 billion people” and represents “an economic loss of c.10% of global gross product.” Declining land productivity also leads to socio-economic instability. “Unless urgent and concerted action is taken, land degradation will worsen in the face of population growth, unprecedented consumption, and climate change.” A global target of Land Degradation Neutrality will require new policies. However, reversing current trends “could generate up to \$1.4 trillion per year of economic benefits.” Widespread lack of awareness is a major barrier to corrective actions. Also see **Climate Change and Land** (IPCC Special Report, Aug 2019 draft, not paginated), stating that “climate change has adversely impacted food security and terrestrial ecosystems, and contributed to desertification and land degradation in many regions.” In turn, changes in land conditions drive global and regional

climate by affecting intensity, frequency, and duration of extreme events. Adaptation and mitigation responses are proposed, as well as near-term actions.

Land degradation parallels changes to the oceans, as reported in **Ocean Connections: An Introduction to Rising Risks from a Warming, Changing Ocean** from the International Union for Conservation of Nature (May 2018, 466p; 37p Summary). “The ocean is now changing more rapidly than it has for millions of years,” due to human interaction with the atmosphere and land, as well as increasing expansion of the human footprint across the ocean. This extensive work by 80 scientists describes ocean/earth system interaction, extreme storm events, pollution, hypoxia (oxygen deprivation), acidification, human health and disease, harmful algal blooms, coral bleaching, fisheries and aquaculture, rising sea levels, ineffective governance, and ocean warming consequences and costs.

Changes in both land and sea are especially profound in the Arctic region, as noted in the **Arctic Report Card 2018** (Dec 2018, 113p; 2p Summary), of the U.S. National Oceanic and Atmospheric Administration. Published annually since 2006, these essays involve 81 scientists from 12 countries on the acceleration of ice melting in a region where temperature changes are twice as high as elsewhere. Topics include rising air temperature, melting of the Greenland ice sheet, terrestrial snow cover, the rising threat of marine microplastics (higher than all other ocean basins in the world), the increase in river discharge, harmful toxic algal blooms, and how Arctic warming affects the jet stream by allowing cold Arctic air to move south. Curiously, methane is not mentioned.

“Clearly accelerating” change in the Arctic is also described in **Global Linkages: A Graphic Look at the Changing Arctic** (March 2019, 54p), produced by GRID-Arendal, a Norwegian foundation cooperating with UN Environment, written by a team of 15 scientists and 12 reviewers. In addition to many maps and charts, the clearly-written text warns of the melting cryosphere (ice, snow, permafrost), pesticide and industrial chemical pollutants, plastics pollution, mercury, and biodiversity concerns. Permafrost—22% of Earth’s surface—is melting and expected to make a major contribution to CO₂ and methane emissions, leading to more thawing. A 20% decline in the current permafrost area is expected by 2040, with 50-65% decline by 2080. Also see **A Farewell to Ice: A Report from the Arctic** by Cambridge University physicist Peter Wadhams (Oxford University Press, 2017, 240p) who describes Arctic methane release as “a catastrophe in the making,” creating extra global temperature rise of 0.6 °C by 2040. This is a well-informed outlier position at present, but may soon become mainstream.

3. Biodiversity, Food, and Water

The Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services issued a lengthy summary of its **IPBES Global Assessment Report on Biodiversity and Ecosystem Services** in May 2019, with the full report of >1,500 pages to be issued later in 2019. It is “the most comprehensive ever completed,” building on the landmark Millennium Ecosystem Assessment of 2005. Based on a systematic review of about 15,000 sources, it was compiled by 145 expert authors from 50 countries, with inputs from another 310 contributing

authors. The IPBES Chair warns that “The health of ecosystems on which we and all other species depend is deteriorating more rapidly than ever. We are eroding the very foundations of our economies, livelihoods, food security, health, and quality of life worldwide.” Some 75% of the land-based environment and about 66% of the marine environment have been significantly altered by human actions. Land degradation has reduced productivity of 23% of global land surface. Some \$235 to \$577 billion in annual global crops are at risk from pollinator loss. Plastic pollution has increased tenfold since 1980. Heavy metals and other wastes have produced >400 ocean dead zones. Of the 8 million estimated plant and animal species on Earth, including 5.5 million insect species, up to 1 million species are threatened with extinction, many within decades. The number of invasive alien species has increased by 70% since 1970. Over 2 billion people still rely on wood fuel for their primary energy needs. And \$345 billion in global subsidies for fossil fuels are resulting in \$5 trillion of overall costs, including nature deterioration externalities.

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Complementing the above, the 12th edition of the World Wildlife Fund’s biennial flagship report, **Living Planet Report: Aiming High** (Oct 2018, 144p; 35p Summary) provides the latest data of the WWF Living Planet Index, which tracked over 4,000 vertebrate species in the 1970-2014 period. The key finding is that global populations have declined by 60% due to agriculture and over-exploitation, and increasing human consumption. WWF proposes a new global deal for nature to reverse biodiversity loss, with a 2020-2050 roadmap for action offering clear goals, targets, and metrics, in support of their Bending the Curve of Biodiversity Initiative. Also see *Nature Communications* 10 (3 Jan 2019), on the rapid decline of bees and other invertebrates.

The State of Biodiversity for Food and Agriculture (Feb 2019, 529p; 64p Overview; 4p Executive Summary), is the first global assessment from the Food and Agriculture Organization of the UN, Commission on Genetic Resources, drawing on information from 91 country reports prepared by some 1,300 contributors, and inputs from 175 authors and reviewers. Discusses genetic resources (animals, forests, aquatic), ecosystem services, insect pollination, soil formation, and resilience. Biodiversity is essential to food and agriculture, but many key components are in decline, due to multiple interacting drivers of change. Much of the planet’s biodiversity is being eroded, “often at an alarming rate.” Use of many biodiversity-friendly practices is increasing, but “sustainable intensification” is needed to ensure food security and nutrition. Also see **The State of Food Security and Nutrition in the World 2019** (FAO/UN, July 2019, 212p), warning that some 2 billion people worldwide experience moderate or severe food insecurity, including 8% of the population in North America and Europe, and **Mainstreaming Biodiversity for Sustainable Development** (Organisation for Economic Cooperation and Development, July 2018, 180p; 4p Executive Summary), on the value of natural ecosystems in economic growth and good practices in agriculture, forestry, and fisheries.

The EAT Foundation in London, along with *The Lancet*, have formed the EAT-Lancet Commission on Healthy Diets from Sustainable Food Systems. Their report, **Food in the Anthropocene**, was published in *The Lancet* (16 Jan 2019, 47p; 30p Summary from <https://eatforum.org>). The 37 scientists from 16 countries, led by Walter Willett and Johan Rockström, warn that most of the world population is inadequately nourished and many environmental systems and processes are pushed beyond safe boundaries by current food production. A global transformation of the food system “is urgently needed” to feed a future population of 10 billion people, by increasing consumption of healthy foods (fruits, vegetables, nuts, whole grains, legumes) and decreasing consumption of unhealthy foods (red meat, sugar, refined grains). Also see **Creating a Sustainable Food Future: Solutions to Feed Nearly 10 Billion People by 2050** (World Resources Institute, World Bank, UNEP, UNDP, July 2019, 556p; 90p Synthesis Report, Dec 2018), warning that food demand is on course to increase by 56% in the 2010-2050 period, and demand for animal-based foods by 70%. Meeting this demand requires reducing food waste, shifting to plant-based foods, increasing fish supply, and improved food production without expanding farmland.

The **UN World Water Development Report 2019: Leaving No One Behind** (March 2019, 182p; 9p Executive Summary), published by UNESCO on behalf of UN-Water, notes that “water use has been increasing worldwide by about 1% per year since the 1980s,” due to population growth, economic development, and evolving consumption patterns. Water demand is expected to increase 20-30% above current levels by 2050. Agriculture, with 69% of global water withdrawals, will remain the largest user, although total share of water use is likely to fall. Over 2 billion people live in countries with high water stress, and some 4 billion people experience severe water scarcity for at least one month per year. Levels of water stress are likely to increase. “Improving water resource management and providing access to safe and affordable drinking water for all is essential for eradicating poverty, building peaceful and prosperous societies, and ensuring that no one is left behind on the road to sustainable development. These goals are entirely achievable, provided there is a collective will to do so.” **WWDR2018: Nature-Based Solutions for Water** describes soil moisture retention, groundwater recharge, constructed wetlands, green roofs, etc.

4. Agendas for Action

The most prominent agenda worldwide is the UN’s 17 Sustainable Development Goals “to transform our world” by 2030, adopted in Sept 2015. A detailed overview of progress to this end is **Sustainable Development Report 2019: Transformations to Achieve the Sustainable Development Goals. Includes the SDG Index and Dashboard** (Bertelsmann Stiftung and Sustainable Development Solutions Network, June 2019, 465p; 2p Executive Summary), with considerable detail finding mixed results. Denmark, Sweden and Finland top the Index, but “no country is on track for achieving all 17 goals.” High-level political commitment to the SDGs is falling short of historic promises, e.g.: SDGs are mentioned in central budget documents in only 18 of 43 countries surveyed. Half of the world’s nations are not on track for achieving SDG 1 (No Poverty). Countries obtain their worst scores on SDG 13 (Climate Action), SDG 14 (Life Below Water), and SDG 15 (Life on Land). No country is

“1.5 °C compatible” or a Role Model for climate mitigation; all EU countries are “Insufficient,” China is “Highly Insufficient,” and the US, Russia, Saudi Arabia, and Turkey are “Critically Insufficient.” Six transformations are needed to achieve the SDGs, as regards education/gender/inequality, health/wellbeing/demography, energy decarbonization and sustainable industry, sustainable food/land/water/oceans, sustainable cities and communities, and digital revolution for sustainable development (see J.D. Sachs, J. Rockström, and five others, “Six Transformations to Achieve the Sustainable Development Goals,” *Nature Sustainability*, 26 August 2019). The **2019 US Cities Sustainable Development Report** (SDSN, July 2019, 52p) has ranked 105 cities annually since 2017. The top four: San Francisco/Oakland, San Jose/Santa Clara, Seattle/Tacoma, and Madison WI. The worst city was Baton Rouge LA.

Most of the scientists’ reports identified here provide an agenda for action to remedy all or some of the above problems. Several reports emphasize speeding up the agenda, notably **Transformation is Feasible: How to Achieve the Sustainable Development Goals Within Planetary Boundaries** (Oct 2018, 58p), published by the Stockholm Resilience Centre as a Report to The Club of Rome. Jørgen Randers, Johan Rockström, and four others describe four scenarios in detail: 1) *Same*: baseline of current policies; 2) *Faster*: acceleration of economic growth; 3) *Harder*: government and business try harder to deliver on the UN’s 17 Sustainable Development Goals; 4) *Smarter*: choosing five transformation actions: rapid renewable energy growth, accelerated food chain productivity, a new development model, reduced inequality, and investment in health and education for all. Randers is one of the four authors of **The Limits to Growth**, the well-known first Report to the Club of Rome in 1972. Rockström is the former director of SRC and lead author of the nine “planetary boundaries” concept published in 2008. This important concept is not described here in any detail, but amply reinforced by the other reports on this list.

The **Exponential Climate Action Roadmap** (Sept 2018, 107p) was presented at the Global Climate Action Summit in San Francisco, concerning global economic transformation by 2030 to meet the Paris Agreement, halving emissions by 2030, energy supply, green bonds, circular economy approaches to production, green buildings, food consumption, forest management, and game-changing strategies. Written by 20 scientists from SRC, Future Earth, WWF, and other organizations, it underpins the Entrepreneurs Call to Action signed by over 300 CEOs.

In 2014, the Global Commission on the Economy and Climate published **The New Climate Economy**, arguing that ambitious climate action need not cost much more than business-as-usual growth. **Unlocking the Inclusive Growth Story of the 21st Century: Accelerating Climate Action in Urgent Times** (World Resources Institute, 2018, 207p; 6p Key Findings and Summary) argues that “we are not making progress anywhere near fast enough.” Current economic models “are deeply inadequate” in capturing opportunities for a transformational shift or the grave dangers of climate inaction. “Bold action could yield a direct economic gain of \$26 trillion through to 2030, compared with business-as-usual. And this is likely to be a conservative estimate.” The challenge now is to accelerate transition to “a new climate economy in five key economic systems: energy, cities, food and

land use, water, and industry.” Priorities for urgent action are pricing carbon, investing in natural infrastructure such as forests and wetlands, zero-emission energy transition plans, and reforming regulations and incentives that hamper shifting to a more circular economy.

The circular economy approach is described in detail by **Re-defining Value—The Manufacturing Revolution** (2018, 272p; 56p Summary), produced by the International Resource Panel, launched by UNEP in 2007 to improve use of resources worldwide. A circular economic system is needed for a sustainable global economy, enabled by remanufacturing, refurbishing, repair, reuse, and value-retention processes, resulting in less waste, green jobs, and lower production costs. The seven authors highlight systemic barriers that may inhibit progressive scale-up, and how they could be overcome. IRP has also published **Global Resources Outlook 2019: Natural Resources for the Future We Want** (March 2019, 158p; 36p Summary) on material resources, water, land use, environmental impacts, multi-benefit policymaking, and two scenarios: Baseline and Sustainability.

5. Overviews

A very extensive overview—“the world’s most comprehensive environmental report”—describes the **Global Environment Outlook Report 2019** (March 2019, 708p; 25p Summary in six languages), the flagship report of the UN Environment Programme. First published in 1997, this 6th report (GEO6), with the theme of “Healthy Planet, Healthy People,” covers climate change as a priority issue, the growing chasm between rich and poor countries, declining genetic diversity as a threat to food security and ecosystem resilience, rising sea levels and ocean temperatures, ocean acidification, water quality “worsened significantly since 1990” in most regions due to organic and chemical pollution, governance challenges, biodiversity (“a major species extinction event is unfolding”), land and soil, resources and materials, effectiveness of environmental policies, the need for transformative change, innovations for systemic transformation, trends in target achievement for selected Sustainable Development Goals, and benefits from following sustainable future pathways: human health and well-being, prosperity, and resilient societies.

In marked contrast to the hefty 708-page GEO6, **World Scientists’ Warning to Humanity: A Second Notice** by William A. Ripple and seven others (*BioScience* 67:12, Dec 2017, 1026-1028) is a compact 3-page overview, a follow-on to an earlier 1992 statement. Signed by >15,000 scientists from 184 countries, now organized as the Alliance of World Scientists, most environmental trends of the past 25 years were seen as “getting far worse.” Concern is expressed about current and potential damage to planet Earth, the 35% increase in human population since 1992, and “potentially catastrophic” climate change. Governments are urged to take immediate action as “a moral imperative to current and future generations of humans and other life.” A 13-point agenda is outlined, calling for renewable energy sources, dietary shifts to mostly plant-based foods, reducing food waste, access to family planning services for all, more outdoor nature education for children, halting conversion of forests and grasslands, well-funded and well-managed nature reserves, and “drastically reducing” consumption of fossil fuels, meat, and other resources.

In further contrast to the two overviews above, **The Global Risks Report 2019** (Jan 2019, 107p), issued by the World Economic Forum of corporate and government leaders meeting annually in Davos, Switzerland, is based on the WEF Global Risks Perceptions Survey of “nearly 1,000 decision-makers from the public sector, academia, and civil society.” Scientists are not mentioned, although some respondents, at least, probably have science backgrounds. This 14th annual edition on evolving risks summarizes the top ten by likelihood and impact. **Top Ten in Likelihood:** extreme weather events, failure of climate change mitigation or adaptation, natural disasters, data fraud or theft, cyberattacks, man-made environmental disasters, large-scale involuntary migration, biodiversity loss/ecosystem collapse, water crises, asset bubbles in a major economy. **Top Ten in Impact:** weapons of mass destruction, failure of climate mitigation/adaptation, extreme weather events, water crises, natural disasters, biodiversity loss/ecosystem collapse, cyber-attacks, critical information infrastructure breakdown, man-made environmental disasters, spread of infectious diseases. No action agenda is proposed, but the report is a valuable reminder that weapons of mass destruction and ruinous cyber-attacks can worsen environmental problems even more. We cannot have sustainability without security, but we also cannot have security without sustainability.

“In the 2020s, new leadership in new directions is needed from experts and advocates, inside and outside of academia.”

Global Catastrophic Risks (2018, 79p; 7p Forward), the annual report of the new Global Challenges Foundation in Stockholm, overlaps with the WEF Risks Report in concerns about nuclear weapons, chemical and biological weapons, catastrophic climate change, ecological collapse, pandemics, and natural disasters—specifically a globally catastrophic volcanic eruption. It differs from Davos by considering an unlikely asteroid impact, technologies such as artificial intelligence and solar geoengineering, and unknown risks. Concludes that “the next 50 years will determine the next 10,000 years,” and that “much is at stake, too little is done, and if we wait until later, caring may no longer matter.” Amen.

6. Concluding Questions

Summing up, these recent online reports present several questions.

- *Too Long, or Too Short?* Some readers with eyes glazed over will find this survey to be too long, while others could argue that it is too short. Surely, the short abstracts presented here beg a more extensive analysis of similarities and differences between these “save the world” agendas, along with many others such as the Green New Deal.
- *Too Disconnected?* The SDGs are mentioned in a few agendas, but are generally ignored, as are other, competing agendas. Is it desirable to attempt to overcome this fragmentation to some degree?
- *Does Aggregation Make Any Significant Difference?* Will more and better surveys help understanding and/or accelerate action? Will calls for a carbon tax or remedies for deforestation by ten large organizations, instead of one, make any difference?

- *Climate Change, or Global Environmental Emergency?* Most scientists, as well as the public, focus on the wicked problem of climate change, increasingly seen as a “climate crisis.” It is certainly an existential threat. But, as many of these reports demonstrate, it is part of a wider global environmental emergency involving degraded land, polluted oceans and air, and declining biodiversity. Even if climate change is halted in coming decades—which is highly unlikely, as increasing Arctic thawing adds more greenhouse gases—the other environmental problems will remain. Will a broader picture of the global environmental emergency encourage more action on climate change, or dilute attention?
- *Why Is There No Information System for Sustainability?* A comprehensive system is needed to identify all important sustainability information—reports, books, organizations, conferences, and articles not only in academic journals but in newspapers and magazines. It should not be confined only to Bibliography, but to Abstracts, Surveys, Indexes, and Critiques. This is easily remembered as Operation BASIC, proposed nearly 60 years ago and still on target.* There are hundreds of information portals offering information on climate and other related matters,† but they are still relatively narrow and overly academic, missing most or all of the hundreds of online reports and “green” books published every year, and failing to highlight what is most important by and for the global leaders of the 2020s who must facilitate the necessary transformations to sustainability.
- *Is a New Strategy Needed?* Generalized reports from leading scientists are important, and deserving of far more attention than they get, both individually and collectively. But, insofar as priorities go, we do not need still more books and reports, let alone obscure journal articles, or more “transdisciplinary” thinking in general, as some advocate. Thinking broadly about strategy, more effort should be made in public outreach: op-ed essays, spin-off articles, and talk-show appearances by leading authors, journalists, and advocates for the evidence-based transformation. Most of the reports in this Top 25 overview include a readable summary, which could be copied and sent to activist groups, teachers, busy policy-makers and, more importantly, their staff members. Also, in addition to the ethical and existential reasons for taking action, far more attention should be given to the benefits of green policies and the costs of ignoring or actively denying what the scientists are saying, and not taking appropriate action or promoting inappropriate action such as supporting fossil fuels.

The key issue is how to develop a broader and deeper appreciation of this emerging global emergency, which by all informed accounts is worsening. In the 2020s, new leadership in new directions is needed from experts and advocates, inside and outside of academia. They

* Bertram M. Gross, “Operation BASIC: The Retrieval of Wasted Knowledge,” *Journal of Communication* 12, 1962, 67-73. Also discussed in Bertram M. Gross, *The Managing of Organizations* (Free Press, 1964, 858-860), as regards “the [urgent] development of more effective knowledge availability systems” for improvement of administrative education—what would currently be seen as “governance”—due to “information overload” and the “problem of trying to keep up” (pp.857-858)

† See Overview Section 1E of The Security & Sustainability Guide (www.securesustain.org) for a listing of over 150 information portals, all useful but none comprehensive.

should promote the broader concept of an increasingly costly environmental emergency that threatens national and global security, draw more attention to the best environmental reports and ideas, and engage in new forms of outreach. An annual list of important recent science reports is one of many necessary actions. The sooner these actions are taken for better environmental information management, the better, for the health, security, and well-being of all.

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