

# Avoiding Collapse

## An agenda for sustainable degrowth and relocalizing the economy

### INTRODUCTION AND RATIONALE

The overarching premise of this paper is that human-induced global change represents a new context for development planning that cannot safely be ignored. Global ecological and socio-economic trends should now be major considerations in reframing even local planning strategies. Indeed, I argue that meaningful consideration of global trends would generate a whole new approach to sustainability planning at every spatial scale. It also represents a more hopeful way forward than anything under consideration today. But prior to outlining the core elements of such an agenda, a brief summary of the compelling need for a new approach is necessary.

While denialists have managed to befuddle popular understanding, there is solid scientific consensus that the world is in ecological overshoot, i.e. that the human enterprise exceeds the long-term carrying capacity of Earth.<sup>1</sup> Environmental and earth scientists have shown that human demands on the ecosphere exceed its regenerative capacity and that global waste sinks are overflowing. The accumulation of anthropogenic greenhouse gases, particularly carbon dioxide, is perhaps the best-known example, but is just one symptom of humanity's frontal assault on the ecosphere—climate is changing, the oceans are acidifying, fresh waters are toxifying, the seas are overfished, soils are eroding, deserts are expanding, tropical forests are shrinking, biodiversity is plummeting. The growth of the human enterprise continues at the expense of depleting self-producing natural capital and polluting life support systems.<sup>2</sup>

Moreover, for the first time since the beginning of the industrial revolution, the world economy is also facing shortages of essential *non*-renewable resources. Global extraction of conventional petroleum had peaked by 2006<sup>3</sup> and current consumption can be maintained only by exploiting ever-more-difficult-to-extract and expensive crude from the seabed, or "tight" oil from ancient shale and tar-sands deposits (and it is questionable how long even this can last).<sup>4</sup>

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- 1 WWF 2012; Rees 2013a.
- 2 Rockström et al. 2009; Rees 2013a.
- 3 IEA 2010.
- 4 Heinberg 2013.

By 2008, 63 of the 89 depletable mineral resources that sustain modern industrial economies had become globally scarce as revealed by diminishing returns to exploration and dramatically rising prices.<sup>5</sup> As the impacts of resource exploitation and excess consumption exceed safe planetary boundaries,<sup>6</sup> *Homo sapiens'* remarkable evolutionary success morphs into ecological dysfunction that threatens the survival of global civilization.

Ecological damage and resource scarcity is largely the result of production and consumption to satisfy just the wealthiest 20 per cent of the world's population. Chronic poverty and egregious inequality are the roots of social upheaval and arguably as much barriers to sustainability as is ecological decay.

And there is an attendant social problem. The litany of ecological damage and resource scarcity is largely the result of production and consumption to satisfy just the wealthiest 20 per cent of the world's population. At purchasing power parity exchange rates, this privileged elite enjoys more than 70 per cent per cent of global income (i.e. consumption) while the poorest 20 per cent survive on a paltry 2 per cent, less than \$1.25 per person per day. If these data are not sufficient to underscore chronic gross inequity, consider that the wealthiest 61 million individuals—less than 1 per cent of the human population—enjoy the same income as the poorest 3.5 billion, 56 per cent of the population.<sup>7</sup> While recent decades have seen a reduction in the proportion of people in abject poverty, mostly in China, progress is glacial. Ortiz and Cummins<sup>8</sup> estimate that it would take more than 800 years for the bottom billion to reach 10 per cent of global income at current rates of improvement. Meanwhile, the absolute number of impoverished has never been greater. In 2005, 40 per cent of the human family—2.6 billion people, which is more than the entire population of Earth in the early 1950s—lived on less than \$2 daily. Chronic poverty and egregious inequality are the roots of social upheaval and arguably as much barriers to sustainability as is ecological decay.

The mainstream “solution” to this double-barrelled conundrum is sufficient economic growth for everyone to become rich.<sup>9</sup> Prompted mainly by corporate interests (through lobbying and election campaign financing), politicians of every stripe assert that only an expanding GDP can eliminate poverty and provide the wealth needed to address ecological concerns. This “solution” ignores ecological overshoot and resource shortages, and it conveniently obviates any discussion of various means to ensure a more equitable sharing of Earth's limited bounty. (This last point is particularly regrettable given that most of the increase in national income in the US, Canada and elsewhere in recent years has gone to the already wealthy; see note 43.) Nevertheless, the world community has expended much effort in recent decades restructuring the global economy to facilitate growth. The accompanying rhetoric extols deregulation, globalization, expanding trade, competition and freer markets; nagging environmental concerns are dismissed with the promise of greater economic efficiency, ecologically benign technologies and enhanced factor productivity (essentially producing more from less). A deluded public generally cheers approvingly from the bleachers.

Arguably, this business-as-usual (BAU) panacea is doomed, even on its own terms. BAU ignores the “rebound effect” and discounts the ecological impacts of increased inter-regional connectivity. The past half-century of global market integration has been accompanied by unprecedented gains in material productivity and technological innovation. Yet the world has witnessed an equally unprecedented explosion in the consumptive throughput of just about everything; for example, roughly half the fossil fuel ever burned has been consumed in just the past 30 years.<sup>10</sup> Meanwhile, the material effect of globalization has been to expose the world's remaining pockets of resources to growing

5 Clugson 2012; World Bank 2013a.

6 Rockström et al. 2009.

7 Ortiz and Cummins 2011; Shah 2013.

8 Ortiz and Cummins, op. cit.

9 Beckerman 1992.

10 Steffen et al. 2007.

numbers of expectant and increasingly affluent consumers. Global restructuring extended the formal economy spatially, while enhanced efficiency and competition lowered prices and increased wages and salaries. As more people with more money chase cheaper goods and services, demand rises, the world economy expands and resource depletion/pollution accelerates. Various “resources” from honeybees through petroleum to songbirds slip down the scale from abundance to scarcity.

The overarching problem is one that the mainstream has yet to acknowledge: on a planet already in overshoot, there is *no* possibility of raising even the *present* world population to developed country material standards sustainably with known technologies and available resources. By 2008, the world population had reached 6.7 billion (it hit 7.2 billion in 2014) with an average eco-footprint of approximately 2.7 global hectares (gha) per capita.<sup>11</sup> However, there were only about 12 billion productive hectares on Earth or just 1.8 average hectares per capita—*global overshoot has already topped 50 per cent.*<sup>12</sup>

We can refer to “1.8 average hectares per capita” as one’s equitable, or fair, “Earth share.” It represents the biocapacity available to support each person, assuming the world’s productive ecosystems were distributed equally among the entire human population.<sup>13</sup> In this light, consider that average Europeans require the productive and carbon assimilative capacities of four to five gha per capita to support current levels of consumption. Thus, if everyone on Earth reached European material standards, aggregate demand would exceed 30 billion gha on a planet with a total of only 12 billion hectares of productive land and water. We would have a biocapacity shortfall of almost two Earth-like planets. The North American eco-footprint is seven gha/capita; to achieve North American levels of consumption and carbon emissions for everyone would demand at least *three* additional Earths (and we would still have to accommodate the material demands of the additional two billion people expected by 2050). This already precarious situation is deteriorating because the fair Earth-share is a moving target, one that shrinks annually with increasing population and accelerating ecosystem degradation. Even the arithmetically challenged should recognize that trying to grow our way out of poverty is ecologically naive and ultimately disastrous for everyone.<sup>14</sup>

Moreover, should we not be concerned that demand in most densely populated, high-income countries has long since exceeded domestic biocapacity? The United Kingdom, for example, uses at least three times as much extraterritorial biocapacity to maintain its consumer lifestyles as is contained within its national territory.<sup>15</sup> The world’s “haves” live, in part, on biocapacity imported from the global

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11 A population’s eco-footprint is the area of productive land and water ecosystems required, on a continuous basis, to produce the renewable resources that the population consumes and to assimilate its carbon wastes (Wackernagel and Rees 1996; Rees 1996, 2013a, 2013b). A “global hectare” (gha) is a hectare of world average productivity. We convert population eco-footprints into standard ghas to enable fair comparisons among regions or countries with differing ecosystem productivities.

12 This means that it would currently take about 1.5 years for the ecosphere to regenerate the renewable resources people use, and to assimilate the carbon their economies emit, each year (WWF 1012). Alarming enough perhaps, but note that eco-footprint data are generally underestimates because, in the absence of adequate data, they do not account for local overexploitation (e.g. soil erosion or declining fish stocks) and include only carbon wastes (Rees 2013a).

13 Rees 2010.

14 Also for other species—biocapacity appropriated for human use is irreversibly unavailable for non-human organisms. Continuous growth of the human enterprise therefore *necessarily* diminishes nature.

15 By contrast, Canada, with its relatively small population and large territory, is one of only a handful of countries whose domestic biocapacity (15 gha/capita) is more than adequate to satisfy domestic demand (6.5 gha/capita). However, the nation’s apparent eco-surplus is absorbed servicing the eco-deficits of over-consuming countries, including the UK. Indeed, exports of food and fibre are contributing to the depletion of the nation’s soils, commercial forests, fish stocks, etc. (Kissinger and Rees 2009; Rees 2013b).

commons and poorer countries half a planet away.<sup>16,17</sup> By contrast, the chronically impoverished survive on 0.5 gha or less and leave almost no footprint beyond their local environs. The world's poor simply don't have the money needed to access even their equitable allocation of the world's bounty.

Indeed, if current trends continue, it is unlikely they will ever achieve "fair share" levels of consumption, let alone eco-equity. Even as climate change and ecosystems degradation take their toll on productivity, remaining "surpluses" of local biocapacity are being appropriated by the rich through trade and, most recently, the phenomenon of "land-grabbing." Richer countries and local and transnational corporate interests are leasing or buying outright millions of the most productive hectares of land in poorer countries in Africa, Latin America and elsewhere, denying access to, and sometimes forcibly evicting, local people from their traditional lands.<sup>18</sup> Oxfam reports that as many as 227 million hectares of land—an area the size of Western Europe—had been sold or leased in developing countries since 2001 (enough to feed a billion people, roughly the number of currently calorically undernourished people on the planet).<sup>19</sup> This latest expression of egregious inequality in an increasingly fractious resource-poor world is likely to foster civil unrest and exacerbate geopolitical instability in coming years.

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Against this background, the goal of this paper is to advance a precautionary, transformational approach to sustainability planning. This framework recognizes that despite a half-century of alarm over the "environmental crisis" and 20 years of political rhetoric on "paradigm-shifting" and "sustainable development," action to date has been mere reform-at-the-margin, not fundamental transformation.<sup>20</sup> Indeed, it is arguable that no *real* progress is possible while the beliefs, values and assumptions of capitalism remain entrenched. Any rationale for rewriting global society's dominant economic narrative must, therefore, dramatically shift the ground for development planning. I assume, for example, that there are real biophysical limits to growth and that both climate change and widespread ecological degradation are indicative of both potentially fatal overshoot and gross market failure. It follows that government intervention in the economy for the common good is justified, even necessary for the survival of global civilization. Drawing on various disciplines from cognitive psychology through environmental science, sociology and economic history, I outline some of the broad framing necessary at the global level and specific policies needed at the national and (bio-)regional scales to achieve a planned descent to a sustainable steady state.

In assessing the proposed strategy, the reader would do well to keep contemporary Canada and British Columbia in mind. The federal government's current economic plan is heavily dependent on tar-sands development and pipeline expansion, i.e. the export of bitumen (among the dirtiest of fossil fuels) to US and world markets; the provincial government has tied BC's economic wagon to as-yet uncertain export markets for liquefied natural gas (LNG) extracted using ecologically destructive and energy-intensive hydraulic fracturing ("fracking"). (In addition, there are plans to expand coal exports.) The boreal forest is being stripped; salmon-bearing rivers, groundwater and the coastline are

16 Rees 2002, 2013b; Kissinger and Rees 2009, 2010.

17 Regrettably, globalization and trade separate high-end consumers spatially and psychologically from the ecosystems that support them. Wealthy consumers thus remain blissfully unaware of their increasingly precarious dependence on distant "elsewheres" for their very existence, even as excess consumption depletes the faraway supportive ecosystems.

18 The 2007–08 boom in food prices, and subsequent high and volatile prices, reminded many import-dependent countries of their food insecurity, prompting them to seek secure supplies overseas. Together with the reduced attractiveness of other assets, this led to a "rediscovery of the agricultural sector by different types of investors and a wave of interest in land acquisitions in developing countries" (Deininger and Byerlee et al. 2011, xxv), increasingly including Canada.

19 Oxfam 2011, 2012.

20 Rees 1995.

threatened; domestic carbon emissions are ballooning; and the nation is becoming a major exporter of climate change—all without serious national debate on this or alternative development strategies. Both levels of government apparently remain in thrall to corporate interests, subscribe to the myth of growth-as-progress and completely discount the environmental and climate risks of business as usual. And should we not be concerned that with such short-term opportunistic “development” strategies the nation reverts to its 19<sup>th</sup>-century role as an exporter of staples<sup>21</sup> to more advanced economies?

## FRAMING AN ACTION PLAN: ARE WE UP TO THE TASK?

*We, like Ahab and his crew, rationalize madness. All calls for prudence, for halting the march toward environmental catastrophe, for sane limits on carbon emissions, are ignored or ridiculed. Even with the flashing red lights before us, the increased droughts, rapid melting of glaciers and Arctic ice, monster tornadoes, vast hurricanes, crop failures, floods, raging wildfires and soaring temperatures, we bow slavishly before hedonism and greed and the enticing illusion of limitless power, intelligence and prowess.<sup>22</sup>*

Chris Hedges’s analogy of the world community and the crew of the *Pequod* in Melville’s *Moby Dick* describes a world in deep denial. Is this an inevitable response to crisis or is there another way? How might a more mindfully conscious world address the (un)sustainability conundrum? This section provides the rationale and major elements for a truly transformational approach to sustainability planning.

The proposed strategy will seem impossibly extreme to some so-called practical people. However, unlike mainstream solutions, it is consistent with the dire implications of growth-induced global change.<sup>23</sup> In particular, it recognizes that global-scale ecological and social turmoil ushers in a unique phase in human history.<sup>24</sup> Climate change has already disrupted the lives of millions, and eventually everyone will suffer the consequences of systemic collapse. No individual can implement the policies necessary (e.g. carbon taxes, resource quotas) to significantly reduce their ecological footprint or revamp the social programs needed for social stability. No country, however virtuous, can be sustainable on its own or remain insulated from global turmoil. Thus, the so-called developed world, long steeped in the rhetoric of competitive individualism, must now grapple with the notion that individual and national interests have all but converged with humanity’s common interests. Unsustainability is a collective problem that demands collective solutions. Arguably, civilization will not survive without recognition that we are all on the same fragile spaceship whose safe passage depends on unprecedented inter-institutional co-operation at all spatial scales.

Working co-operatively for the common good will require the ardent exercise of several intellectual and behavioural qualities that are unique (or nearly so) to our species:

- high intelligence, the capacity to reason logically from available facts and data;
- the ability to plan ahead, to direct the course of events toward desired ends;
- an unequalled array of socio-behavioural means and mechanisms for co-operation;

21 For more on Canada’s past and present as a staples exporter, see the CCPA report: <https://www.policyalternatives.ca/publications/reports/staple-theory-50>.

22 Hedges 2013.

23 There may be other alternatives, but for success each must be consistent with biophysical and social reality.

24 The mainstream shows signs of awakening. Even the World Bank acknowledges that “The science is unequivocal that humans are the cause of global warming” and that “we are on a path to a 4°C (7.2°F) warmer world...with potentially “devastating impacts on agriculture, water resources, ecosystems, and human health.” Bottom line? Four degrees of warming “must be avoided” and “...bold, ... immediate global action is needed to slow the growth in greenhouse gas emissions this decade” (World Bank 2013b [emphasis added], 2012; see also Kojm 2012).

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- the capacity for moral judgment, the ability to distinguish right from wrong; and
- the ability to empathize with other people and even non-human species and to exercise compassion toward “the other.”

(It is worth noting that certain of these capacities have been deliberately repressed in the socio-political discourse of recent decades.)

An orderly contraction is the only viable means to a just sustainability and this, in turn, implies nothing less than a deliberate rewrite of contemporary society's grand cultural narrative. In particular, the world would have to abandon its core myths of perpetual progress and material growth and focus instead on degrowth toward a sustainable steady state with greater equity.

The starting point for any contemporary survival strategy should be to embrace a possibility that mainstream governments and international agencies have thus far been loath to contemplate (at least in the public arena): in coming decades, the human enterprise will likely be forced to contract. Two basic scenarios bookend the range of possible contraction possibilities.

1. BUSINESS AS USUAL: Any sustained effort to maintain the growth-based status quo risks triggering systemic collapse in the form of either uncontrollable climate change, wide-spread ecological destruction and the loss of essential life-support functions<sup>25</sup> or diminishing returns to investment in resources, commodity shortages, rising costs/prices, competition for capital, unrepayable indebtedness and increasing social disparity. Either set of conditions (or some combination) defines a path to economic implosion, civil insurrection, geopolitical turmoil and resource wars.<sup>26</sup>
2. A CO-OPERATIVE, WELL-PLANNED ORDERLY DESCENT: In theory, the global community is capable of deliberately planning and executing a “prosperous way down” and still has the resources to do so.<sup>27</sup> The goals would be to restore and maintain the ecosphere while ensuring social order and reasonable economic security for all.<sup>28</sup> As noted above, this approach requires a complete transformation of national and global development paradigms.<sup>29</sup>

Can there be any doubt which end of the spectrum an objective member of an intelligent, forward-thinking, plan-capable, morally astute and (mostly) co-operative species should choose? An orderly contraction is the only viable means to a just sustainability and this, in turn, implies nothing less than a deliberate rewrite of contemporary society's grand cultural narrative. In particular, the world would have to abandon its core myths of perpetual progress and material growth and focus instead on degrowth toward a sustainable steady state with greater equity.<sup>30</sup>

## SOCIALLY CONSTRUCTING A NO-GROWTH ALTERNATIVE

*It seems implausible that humanity will not alter its energy course as consequences of burning all fossil fuels become clearer. Yet strong evidence about the dangers of human-made climate change have so far had little effect.*<sup>31</sup>

<sup>25</sup> Barnosky et al. 2012.

<sup>26</sup> Klare 2001, 2012.

<sup>27</sup> Odum and Odum 2001.

<sup>28</sup> Victor 2008.

<sup>29</sup> E.g. Greer 2008.

<sup>30</sup> An economic steady state implies a more or less constant rate of energy and material throughput, compatible with the regenerative and assimilative capacities of the ecosphere. The steady state is not to be confused with a stagnant state. A steady-state economy can be dynamic, constantly changing with the rise of new and the decline of “sunset” industries. It is an economy dedicated to qualitative improvement in well-being, not merely quantitative growth.

<sup>31</sup> Hansen et al. 2012.

Those who track the state of the ecosphere should be excused for being discouraged. A complex of interrelated behavioural tendencies combine to stifle the political will for decisive action: humans generally have difficulty processing information that conflicts with what they already “know”; even when convinced of the need for change, people are not wholly rational in dealing with threats to their socio-economic status or political power; and privileged elites with the greatest stake in the status quo increasingly exert control over the political process.

The first of these barriers is nearly universal and reflects another unique quality of *Homo sapiens*—much of what we assume to be true, much of what masquerades as “reality” in our conscious minds, is to some degree socially constructed.<sup>32</sup> Other sentient organisms respond to the world as they find it, their reactions dictated by instinct, predictable stimulus-response mechanisms and simple trial-and-error learning. By contrast, human groups collectively create complex abstract frames of understanding through which they filter subsequent sensory and emotional inputs. Different framings will produce different responses to the same stimuli with correspondingly different impacts on the well-being of the individual or group involved.

As post-modernists like to remind us, there are no theoretical limits to the diversity and form of alternative perceptions. Indeed, every religious doctrine, political ideology, academic paradigm, worldview and cultural narrative is a social construct. But this by no means implies that competing constructs are equally valid, particularly those pertaining to important aspects of biophysical reality. The important thing to recognize is that socially constructed norms, whether or not they “map” well to reality, profoundly influence how people act out in the world. Indeed, the evidence shows that social constructs carry sufficient weight, even in the face of contrary facts, to determine the fates of entire societies.<sup>33</sup>

### Grappling with the elephant in the room

*Anyone who believes in indefinite growth in anything physical, on a physically finite planet, is either mad or an economist.*<sup>34</sup>

The contemporary growth economy is a malignant social construct. We need to replace it with an ecologically benign and socially equitable no-growth variant. The idea that the economy would eventually stop growing actually dates from at least the mid-18<sup>th</sup> century when Adam Smith (incorrectly) predicted that a surplus of labour and resource scarcity would impose a limit on growth after just 200 years.<sup>35</sup> Almost a century later, John Stuart Mill also argued that society would reach a “stationary state,” but he hoped for a *deliberate* transition. Mill saw no virtue in becoming richer than one need be and advocated instead for a just distribution of property “...attained, by the joint effect of the prudence and frugality of individuals, and of a system of legislation favouring equality of fortunes....” Thoroughly modern, Mill even made an ecological connection. He lamented that the “unlimited increase of wealth and population” would cause Earth to lose “that great portion of its pleasantness which it owes to [nature], for the mere purpose of enabling it to support a larger, but not a better or a happier population.” He therefore hoped that people would come to “be content to be stationary, long before necessity compels them to it.”<sup>36</sup>

32 Berger and Luckmann 1966.

33 Tainter 1988; Diamond 2005.

34 Boulding 1973.

35 Smith 1776.

36 All quotes from Mill 1848:bk. 4, chap. 4.

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It took yet another century to reawaken interest in Mill's "stationary state" (though Mill would regret that "necessity compels [us] to it"). Beginning in the 1960s, the work of Nicholas Georgescu-Roegen<sup>37</sup> and his acolyte Herman Daly<sup>38</sup> culminated in a new discipline, ecological economics, which has debated the notion of a steady-state economy for the past 25 years. Also with intellectual roots in Georgescu-Roegen, the first decades of the 21st century have spawned an increasingly global "degrowth" (*décroissance*) movement. Proponents advocate a gradual downscaling of production and consumption toward a more equitable and co-operative society that would ensure both ecological stability and human well-being.<sup>39</sup>

Thoughtful people contemplating steady-state sustainability with justice (the essence of our scenario 2) usually draw on the following arguments:

1. Continuous growth of anything in a finite space is anomalous and ultimately self-correcting. For 99.9 per cent of human history, local populations rarely grew for extended periods but rather fluctuated near carrying capacity as a function of food supplies, disease, etc.<sup>40</sup> The recent 200 years of continuous growth that we consider the norm is actually the single most *abnormal* period in human history. Indeed, the present (socially constructed) policy fixation on growth dates only from the 1950s.
2. Economic *production* is actually mostly a *consumptive* process. Manufacturing, for example, irreversibly transforms large quantities of useful energy and material into an equivalent mass of useless waste (even the smaller quantity of product eventually joins the waste stream). Economic activity inexorably dissipates resources and increases the entropy (randomness, disorder) of the ecosphere.
3. Beyond a certain income level (long passed in high-income countries) there is no further correlation between GDP per capita and objective indicators of either population health or perceived well-being.<sup>41</sup> Once basic material needs are met, it is not rich countries but rather countries with greater income equality that perform better on standard quality-of-life indicators. Greater social equity is "better for everyone."<sup>42</sup>
4. With the promulgation of neo-liberal (corporate/capitalist) policies, an increasing proportion of the income gain from GDP growth accrues to the already wealthy—who don't tangibly benefit—at the expense of middle and lower classes.<sup>43</sup> The income

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37 Georgescu-Roegen 1971.

38 Daly (1973, 1991).

39 Kerschner 2010; Gheorghică 2012.

40 All species populations would be capable of continuous geometric (exponential growth) in an infinite habitat. Normally, however, space and resource shortages combined with disease, predation and weather effects hold populations in check. Human ingenuity and technology have temporarily loosened the grip of such negative feedbacks on the human enterprise.

41 Lane 2000; Victor 2008.

42 Wilkinson and Pickett 2010.

43 In 1980 the richest countries with 10 per cent of the world's population enjoyed a gross national income 60 times that of the poorest countries with 10 per cent of the world's population. By 2005 the ratio stood at 122:1. Meanwhile, the poorest quintile of the population within many countries has suffered a declining share of national consumption over the last 15 years (WHO 2013). For example, the top 1 per cent of income earners in the US captured 95 per cent of total income gains since 2009 and now enjoy 10 per cent of total household income. The richest 10 per cent of households take home half the nation's income (Saez 2013). While the trend is less dramatic in Canada, the total net worth of the poorest 20 per cent of Canadian families actually decreased by 15 per cent between 1999 and 2012, leaving them with negative net worth (debts exceeding assets) of more than \$10 million. By contrast, the richest 20 per cent of Canadian families captured two-thirds of the total increase in national wealth during this period and their net worth grew by more than 80 per cent (Canada 2014).

gap is increasing even as over-consumption depletes natural capital and undermines life-support systems. The chronically impoverished are hit the hardest, but such trends ultimately threaten everyone.

5. With integrated fiscal, tax, employment and population policies and the like, it should be possible to create an ecologically viable, more equitable, economically stable, no-growth economy with minimal unemployment and poverty.<sup>44</sup>

Even some climate-change scientists are breaking from their normal policy-neutral stance by voicing explicit support for orderly economic contraction. Unless the world can reconcile economic growth with an unprecedented 6 per cent per year decarbonization rate, avoiding a potentially catastrophic 4°C increase in mean global temperature may well require a “planned economic recession.”<sup>45</sup> Mill was a century and half ahead of his time.

## ACTION ON THE GLOBAL SCALE: CATCHING UP WITH MILL

*It is only in the backward countries of the world that increased production is still an important object: in those most advanced, what is economically needed is a better distribution, of which one indispensable means is a stricter restraint on population.*<sup>46</sup>

Let’s assume that the rising cost of global change or some major catastrophe precipitates a great awakening, that world leaders are shocked into agreeing that the science of climate change is basically correct and demands a decisive collective response. They will be on war footing and, with unprecedented unity, will launch a World Assembly for Mutual Survival.

The first thing this high-level forum might acknowledge is that the crisis is the inevitable result of an ill-conceived economic paradigm that assumes poverty and most other human problems can be resolved by technology and growth alone. The question then becomes “what alternative conceptual framing might provide the foundation for a new global narrative that better conforms to reality?”

Certainly recognition of biophysical limits to growth would be near the top of the list. The World Assembly might therefore adopt as its overall goal: *to engineer the creation of a dynamic, more equitable steady-state economy that can satisfy the basic needs of the entire human family within the means of nature.* Fair enough. However, our best science tells us that for the human enterprise to operate compatibly “within the means of nature” merely *curtailing* growth would not be enough. This is a world in overshoot—a sustainable steady-state economy will be a materially smaller economy. In general terms, the world needs to reduce fossil energy use, material consumption and pollution by 50 per cent or more by mid-century.

Moreover, to address egregious inequality, wealthy countries would have to reduce their energy/material throughput by 80 per cent by 2050 and abandon fossil fuels entirely shortly thereafter.<sup>47</sup>

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44 Jackson 2009; Victor 2008.

45 Anderson and Bows 2008.

46 Mill 1848:bk. 4, chap. 6.

47 Rich countries will have to phase out fossil fuels entirely before century’s end. Taking into account the pace of climate change and paleoclimatic evidence that even 2 Celsius degrees of mean global warming would be catastrophic, the latest science argues for limiting atmospheric CO<sub>2</sub> to 350 ppm (it’s currently near 400 ppm and rising) and warming to 1 Celsius degree (Hansen et al. 2013). If we were to begin cutting carbon emissions by 6 per cent annually, we would achieve the required short-term 80 per cent reduction by 2040 and be essentially free of fossil energy by 2090.

The additional commitment is necessary to free up the “ecological space” needed to improve material conditions in developing countries where, in Mill’s words, “increased production is still an important object.” If global growth is no longer available as a poverty-reduction tool, “a better distribution” (Mill again) emerges as the only viable policy option.

Needless to say, contraction is not an idea that resonates with contemporary economic thinking. If an orderly transition requires the consent and involvement of a majority of citizens, it also demands a dramatic shift in social-cultural norms. Specifically, the new narrative must de-emphasize competitive individualism, greed and short-term self-interest and trumpet instead the adaptive strengths of co-operation, community and people’s common interest in survival. It must also discard the shrivelled representation of the human character portrayed in neo-liberal economic models. *Homo economicus* is an atomistic self-interested utility maximizer devoid of family, community, place and any meaningful relationship with nature; this creature defines “rational” strictly in terms of maximizing personal consumption. Real people are vastly more complex; we live socially in physical communities and are capable of expressing a full spectrum of attitudes, behaviours and relationships to the rest of the world. We can all be greedy and self-serving on one occasion, generous and selfless on another; we can all enjoy the thrill of competition but are just as capable of joyful co-operation; for most people, money is a means to live, not an end in itself. The key insight is that, while human nature displays a spectral palette of attributes and behaviours, cultural nurture helps determine which of these “colours” shine most brightly. As previously noted, we socially construct the cultural norms that shape our interactions with each other, with other species and with the ecosystems that sustain us.

In general terms, the world needs to reduce fossil energy use, material consumption and pollution by 50 per cent or more by mid-century. To address egregious inequality, wealthy countries would have to reduce their energy/material throughput by 80 per cent by 2050 and abandon fossil fuels entirely shortly thereafter.

This is good news. As part of a survival plan, the world community will agree to a worldwide social marketing program designed both to bring the majority of citizens on board and to counter the inevitable push-back from those with the greatest stake in the status quo. Public re-education is necessary to inform ordinary citizens of the severity of the crisis and to animate values and behaviours compatible with the steady state. The program must advance a positively attractive vision of the future that ensures economic security, social cohesion and ecological stability. It must also graphically contrast this vision with the future of resource wars, geopolitical turmoil and climate chaos likely to unfold if we maintain our BAU trajectory.

There will undoubtedly be objections to any such global social learning exercise. However, let’s remember that the denizens of today’s self-destructive consumer society are already the most thoroughly socially engineered generation of humans ever to walk the planet; that billions of dollars are spent every year in public relations, advertising and deliberate misinformation campaigns to ensure that they remain tuned to the status quo; and that this programming is destroying their future prospects.<sup>48</sup>

48 Since the 1970s, business interests in North America have been remarkably successful in reframing popular political discourse to reflect corporate capitalist values against the perceived threats of civil rights, environmentalism and other “common good” values. The evidence is in corporate sponsorship of university chairs of (neo-liberal) economics, the founding and financial support of numerous influential neo-conservative think tanks (e.g. the Cato Institute, the Heartland Institute), and the sponsorship of right-wing talk radio and television programming. The latter are notable for their anti-intellectual/anti-science stance as reflected in support for creationism and climate change denial.

## BASIC POLICIES FOR GLOBAL/LOCAL SUSTAINABILITY

The cult of consumerism is not only spiritually empty but also ecologically destructive. To repair the failing ecosystems and life-support functions upon which we all depend, steady-state thinking emphasizes investment and conservation over spending and consumption. It also must work to restore trust in government as needed to mend our social safety nets and cultivate mutually supportive relationships among social groups.

### Fixing broken markets

Both ecological and social sustainability require that we abandon neo-liberals' unbridled confidence in markets as the sole wellspring and arbiter of social values. Climate change, fisheries collapses, ecosystems degradation and illegal sweatshops are all examples of gross market failure. The World Assembly must relegitimize national government intervention in markets to protect the common good; the world needs sound planning, selective reregulation and comprehensive extra-market adaptation strategies for global change.

A major goal is to ensure that prices reflect the full costs of production and use. True-cost economics recognizes the need to:

- End perverse subsidies to the private sector (e.g. to the fossil fuel sector, fishing fleets, the corn ethanol industry, and private banks “too big to fail”);
- Reregulate the private sector as necessary to protect the public interest;
- Introduce scheduled ecological fiscal reforms—tax the bad (depletion and pollution) as well as the good (labour and capital). This might require a combination of pollution charges/taxes on domestic produces and import tariffs on underpriced trade goods;<sup>49</sup> and
- Tie development policy to the “strong sustainability” criterion (i.e. maintain constant, adequate per-capita stocks of critical natural, manufactured and human capital assets in separate accounts). This requires that we learn to live on sustainable natural income, not natural capital liquidation. Society must therefore:
  - Implement “cap-auction-trade” systems for critical resources such as fossil fuels—i.e. place sustainable limits on rates of resource exploitation (or waste discharges), auction off the exploitation rights to available capacity, and use the rents thus captured to address subsequent equity issues;
  - Revise systems of national accounts to include biophysical estimates of essential natural capital stocks and sinks in support of the previous measure;
  - Enforce an adequate minimum (living) wage; and
  - Replace or supplement GDP with more comprehensive/realistic measures of sustainable human well-being.

We must work to restore trust in government as needed to mend our social safety nets and cultivate mutually supportive relationships among social groups.

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<sup>49</sup> For more on how an equitable and effective carbon tax can be modelled, see Lee 2011.

## Rewriting the social contract

Consistent with the principles of community, co-operation and people's common interest in an orderly transition, the World Assembly would generate guidelines for individual nations to renew the social contract and repair social safety nets. National plans would include programmatic tax reform based on recognition that taxation is society's means of pooling resources in service of the common good, particularly in times of widespread threat. Specific elements of the program might include:

National plans would include programmatic tax reform based on recognition that taxation is society's means of pooling resources in service of the common good, particularly in times of widespread threat.

- A return to more progressive taxation policies encompassing income, capital gains, estate and corporate taxes;<sup>50</sup>
- Using taxes and positive incentives to promote a shift from private capital accumulation to investment in public infrastructure (e.g. transit, community facilities) and human development;
- Recognition that a negative income tax (e.g. guaranteed basic income) may be necessary to assist low-income families through the transition and to ensure access to the basics for life;
- Investment in job training and job placement. Obsolete, unsustainable "sunset" industries must be phased out (e.g. coal-based electricity generation) and workers will need new skills for employment in emerging sunrise industries (e.g. solar energy technologies, *passivhaus* building);<sup>51</sup>
- Capitalizing on the advantages of a shorter work week and job-sharing to reduce unemployment and improve people's work/life balance (self-actualization);
- Other measures to promote full employment; and
- Implementing state-assisted family planning programs everywhere to stabilize/reduce human populations.

## RETHINKING GLOBALIZATION, RESTORING LOCALITY

The global survival plan would also partly unravel today's increasingly unsustainable eco-economic entanglement of nations. The rationale is clear: first, the human mind is incapable of adequately understanding, let alone safely controlling, the behaviour of complex global-scale systems under stress.<sup>52</sup> On the other hand, local/regional human communities and ecosystems are more manageable and any negative "surprises" will be confined to the affected region. Second, unfettered trade allows trading regions to exceed their local carrying capacities with short-term impunity while it both depletes remaining reserves of natural capital and accelerates global pollution, increasing the risk to all. Global overshoot would be eliminated if each region were sustainably managed. Third, the economic restructuring (e.g. national/regional economic specialization) required for global market efficiency reduces domestic economic diversity and resilience, destroys livelihoods

50 The CCPA has produced many reports outlining ideas for progressive tax reform. See for example Lee and Ivanova 2013.

51 For more on the transition to green jobs, see the Climate Justice Report by Lee and Card 2012.

52 This is perhaps the most powerful argument against attempts to "geo-engineer" solutions to climate change. Unintended systems responses are inevitable, unpredictable and most likely to be negative.

and sometimes whole communities and devalues the skills of local populations. Moreover, because specialization makes people dependent on trade for everything no longer produced locally, it increases their vulnerability to global change—crop failures, energy bottlenecks, geopolitical instability and even changes in market conditions.<sup>53</sup> What will China do when it can no longer feed itself because global surpluses are inaccessible or have disappeared? Fourth, global economic integration is partially a product of abundant cheap energy. With rising energy costs (the end of the fossil fuel bonanza?) the relocalization of production in heavy-goods sectors affected by rising transportation costs is already occurring and, as energy supplies shrink, the rest of the economy will necessarily follow. Fifth, unlike capital, many people feel affinity to their home communities (and are not fluidly mobile in any case).

To rebalance the tension between the global and local economies, the world community should revise WTO rules and similar regional trade treaties (e.g. NAFTA, the European Union). Nations and regions will be able to adapt creatively to emerging conditions only if they are free to:

- Develop deglobalization plans to reduce dependence on foreign sources and sinks (i.e. reduce nations' ecological footprint on others' ecosystems and the global commons);
- Generally increase national self-reliance in food, energy and other essential resources as a buffer against climate change, increasing scarcity and prices, and global strife;
- Simultaneously relocalize, re-skill domestic populations, strengthen domestic markets and diversify local economies through import displacement. Every nation/region should be able to produce the basic goods to feed, clothe and house itself, for example;
- Encourage development of local currencies and local exchange trading systems to facilitate intra-regional trade and buffer local economies from external market fluctuations;
- Insist on terms of international trade that prohibit capital depletion and that provide the producer surpluses needed to maintain essential natural capital stocks (e.g. soils, fish stocks); and
- Invest in rebuilding local/regional natural capital stocks (e.g. fisheries, forests, soils, biodiversity reserves, etc.) that have been traded away, using revenues collected from carbon taxes or resource-quota auctions.

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Let's be clear that rebalancing does not mean abandoning international trade. Trade does provide an important buffer in the event of domestic shortages caused by drought or disaster; it is necessary to acquire vital goods that cannot be produced locally. In any event, some countries and regions with large ecological deficits will remain highly trade-dependent at least until their populations fall to more sustainable levels. The rule for resilient local economies should be: export only true ecological surpluses (no net loss of productive natural capital) and import only important commodities that cannot reasonably be sourced at home. "Trade if necessary, but not necessarily trade" serves as convenient shorthand.

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53 Rees 2002, 2012; Kissinger and Rees 2009, 2010.

## Bringing it back home: relocalization

*Those people...living in relatively self-reliant, organic, village-scale settlements should be able to ride the change with minimal difficulty and will emerge into the post-civilization phase intact.*<sup>54</sup>

The uncertainties associated with global change also have important implications for urban form and function.<sup>55</sup> Urban designers and planners should begin now to rethink cities—or rather urban regions—so they function as complete quasi-independent human ecosystems. This is the ultimate form of functional bio-mimicry.<sup>56</sup>

Urban designers and planners should begin now to rethink cities — or rather urban regions — so they function as complete quasi-independent human ecosystems. Less dependent on imports for the necessities of life, bioregionally focused populations would be partly insulated from external climate vagaries, resource shortages and distant conflicts.

The city-as-ecosystem requires the relocalization of many ecological functions. Contemporary urbanization, combined with globalization, has transformed local, integrated, cyclical human ecological production systems into global, horizontally disintegrated, unidirectional throughput systems.<sup>57</sup> Rather than being recycled on the land, essential nutrients contained in grain from the Russian steppes or Canadian prairies wind up in distant oceans, irreversibly discharged from urban sewage outfalls all over the world. The soils of some of the world's most important breadbaskets have lost half or more of their natural nutrients in just a century of mechanized agriculture.

The least vulnerable and most resilient urban system might be a new form of urban-centred bio-region (or eco-city state) in which a densely built-up core is surrounded by essential supportive ecosystems. The goal is to consolidate as much as possible of the human community's productive hinterland in close proximity to its consumptive centre. Organic "wastes" and nutrients could then be economically recycled back to farms and forests.

Such a bioregionalized city would reconnect its human population to "the land." Citizens would see themselves to be directly dependent on local ecosystems and thus have a strong incentive to manage them sustainably. Less dependent on imports for the necessities of life, bioregionally focused populations would be partly insulated from external climate vagaries, resource shortages and distant conflicts.

Ideally, regional eco-cities would develop economic and social planning policies to facilitate reducing their residents' ecological footprints to a globally equitable 1.8 gha per capita. This is technically possible<sup>58</sup> and the implicit greater equity could actually improve individual and community well-being.<sup>59</sup> In any case, footprint contraction is essential to protect the regenerative capacity of nature and, where possible, to maintain populations within regional carrying capacity.

Clearly, the bioregional vision would require new governance structures that devolve significant control over their extended territories and resource hinterlands to eco-city states. These mechanisms would function to manage land, ecosystems and other resources vital to sustaining human life in the long-term collective interests of the entire community. This, in turn may require stinting some customary private property rights. On a planet in overshoot, it is unacceptable for landowners to destroy through "development" the life-support functions required by everyone. Protecting a redefined commons would be a fundamental goal of any socially just and sustainable steady state.

54 Mare 2000.

55 Register 2006.

56 Rees 2012.

57 Rees 1997, 2012.

58 Von Weizsäcker et al. 2009.

59 Wilkinson and Pickett 2010.

## EPILOGUE: MIRED IN DENIAL?

*The bad news is that evidently things still have to get much worse before we will muster the courage and clarity to try to make them better. The “good news” is that things are indeed getting worse....*<sup>60</sup>

This paper started from the premise that the human enterprise has already overshot global carrying capacity and that accelerating global change will soon force the world community to contemplate the end of material growth. I argued that if our best climate and environmental science is basically correct then humanity faces a choice between maintaining business-as-usual—in which case nature is likely to impose a chaotic implosion—or planning an orderly equitable contraction. In short, to achieve sustainability with justice we will have to deliberately scale back the global economy (or at least reduce the throughput of energy and material) and consider means to redistribute ecological and economic wealth at national and local levels. This would require the world community to collaborate in the social construction of a new economic narrative founded on stationary or steady-state thinking. We must also reconsider the role of globalization and trade and begin the relocalization of much economic activity at the community and regional levels.

Contemplating wholesale relocalization after decades of rhetoric on the inevitability of global integration makes it appear the most daunting of tasks. However, there is nothing ordained or sacred about contemporary globalization. It is purely a social construct, the product of many human minds, laboriously negotiated global and regional agreements and arguably designed mostly to serve the interests of capital and the corporate sector. It can therefore be deconstructed and replaced. A global network of largely self-reliant bioregional subsystems based on the principles described above would ensure a more economically secure, ecologically stable and socially equitable future for the majority of the world’s people. If each such interlinked bioregion managed to stabilize its domestic population and conserve adequate per-capita stocks of natural capita, the aggregate effect would be global sustainability.

In theory, opting for this alternative should not be a difficult choice for *Homo sapiens*. Would an ostensibly intelligent, forward-thinking, morally conscious, compassionate species continue to defend an economic system that wrecks its planetary home, exacerbates inequality, undermines social cohesion, generates greater net costs than benefits and ultimately threatens to lead to systemic collapse?

Remarkably, the answer so far seems to be “yes.” There are simply no strong voices for caution among contemporary leaders and certainly no political constituencies for degrowth. There is no nascent plan for a World Assembly for Mutual Survival. Humanity’s unique capacities for collective intelligence, rational analysis and planning ahead for the common good play no major role in the political arena, particularly when they challenge conventional myths, corporate values and monied elites. On present evidence, there is little possibility that anything like the proposals outlined above will be implemented in time for a smooth transition to sustainability. Daly was right: “evidently, things still have to get much worse before we will muster the courage and clarity to try to make them better.”<sup>61</sup>

We are our own worst enemy. People are naturally both short-sighted and optimistic and thus discount the future; we generally react emotionally/instinctively to things that threaten our social status or political/economic power; those most vested in the status quo therefore vigorously resist

To achieve sustainability with justice we will have to deliberately scale back the global economy and consider means to redistribute ecological and economic wealth at national and local levels.

60 Daly 2013.

61 Ibid.

significant change; corruption and greed (all but sanctioned by contemporary morality) overshadow the public interest.

Mindless dedication to entrenched beliefs is a particularly powerful blinder to otherwise obvious truths. History shows that the resultant “Woodenheadedness...plays a remarkably large role in government. It consists in assessing a situation in terms of preconceived fixed notions (i.e. ideology) while ignoring any contrary signs. It is acting according to wish while not allowing oneself to be deflected by the facts.”<sup>62</sup> Neuroscientists have long recognized the general phenomenon, but the means by which people become so deeply committed to particular concepts has only recently been revealed. In the course of individual development, repeated social, cultural and sensory experiences actually trace a semi-permanent record in the individual’s synaptic circuitry—cultural norms, beliefs and values can acquire a physical presence in the brain. Once entrenched, these neural structures alter the individual’s perception of subsequent experiences. People tend to seek out situations, people and information that reinforce their neural “presets.” Conversely, “when faced with information that does not agree with their internal structures, they deny, discredit, reinterpret, or forget that information.”<sup>63</sup>

Would an ostensibly intelligent, forward-thinking, morally conscious, compassionate species continue to defend an economic system that wrecks its planetary home, exacerbates inequality, undermines social cohesion, generates greater net costs than benefits and ultimately threatens to lead to systemic collapse?

In this light, the citizens of market democracies may well be blindsided by a socially constructed bias toward capitalist values and market ideology, which combines with innate behavioural conservatism in a formidable barrier to societal transformation. The fate of global civilization may therefore rest on humanity’s penchant for self-delusion in the face of harsh reality. People’s learned or “soft-wired” cognitive barriers can be broken down, but this requires acknowledgement of the problem and significant effort on the part of the individual—or an external shock powerful enough to shatter the treasured illusion.

So where does this leave us? The pace of global change is quickening, but it may well be that the mainstream world community is too fractious in outlook, too belligerent in defence of political status and tribal territory and too wedded to conventional myths to rise to the sustainability challenge. Despite considerable grassroots activity and the proliferation of sustainability-oriented NGOs, preferred lies and shared illusions may hold sway over discomfoting facts until it is too late to engineer a “prosperous way down.”<sup>64</sup>

Should this be our fate, it wouldn’t be the first time a human culture has risked tripping into the abyss—the most intriguing thing about the evolution of human societies is “the regularity with which the pattern of increasing complexity is interrupted by collapse...”<sup>65</sup> (Exceptions are those societies that are able to reject problematic core values and beliefs and replace them with more adaptive cultural narratives.)<sup>66</sup> What would be unprecedented is the sheer scale of the implosion. Previous ill-fated societies were regional societies, but if *global* civilization goes down, it could mean the end of the entire human experiment. *Homo sapiens* will have been selected out by ecological and social environments in turmoil. We will have failed to adapt, despite exquisite documentation of the changing reality destined to do us in.

Suggested epitaph: “Too clever by half but not nearly smart enough.”

62 Tuchman 1984:7.

63 Wexler 2006.

64 Odum 2001.

65 Tainter 1995.

66 Diamond 2005.

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## CLIMATE JUSTICE PROJECT

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For more reports from the Climate Justice Project, see [www.climatejustice.ca](http://www.climatejustice.ca)



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