1

The Global Context for Sustainability

In the pursuit of sustainability, we first need a basic understanding of what that means. A long-standing but evolving term, sustainable development has been open to interpretations and debates; some of which we will look at here. The term ***sustainable*** implies a constant state, or the ability of a system to maintain, uphold, or preserve its functions. Thus, "a sustainable society is one that can persist over generations, one that is farseeing enough, flexible enough, and wise enough not to undermine either its physical or its social systems of support."[1]

Sustainability is a concept that emerged in response to environmental concerns but is one that has expanded to include the economic and social implications of how humanity survives and thrives on planet Earth at all levels of analysis—from global to local. ***Sustainable development*** is the process and activities leading toward the end state of ***sustainability***.[2]

The 1987 Brundtland Commission Report defined sustainable development as "meeting the needs of the present without compromising the ability of future generations to meet their own needs"[3] and endowed the concept with political credibility. Sustainable development can connote sustainable *use* of renewable resources within their capacity for renewal,[4] but it historically carries industrialized world connotations.[5] This is because when sustainable ***development*** is conflated with sustainable ***growth***, it becomes an oxymoron—nothing physical can grow indefinitely. While *quantitative* increases in population, production, and income are aptly described as "growth," *qualitative* changes, such as improvements in health, knowledge, quality of life, social justice, and efficient use of renewable resources, are more accurately described as "development."

Sustainable development is also sometimes confused with protection of the environment. For additional clarity, environmental ***protection*** generally prevents land, water, and air pollution from human waste; environmental ***conservation*** generally manages land and bodies of water used by humans in a sustainable manner; environmental ***preservation*** keeps land and bodies of water pristine and excluded from human use; and environmental ***restoration*** recovers already degraded or damaged ecosystems (see Chapter 6).

In practice, the very concepts of environmental protection, conservation, preservation, or even restoration are based on the separation

of humanity from nature; we draw a boundary around what we think of as nature, then try to protect what's within the box. In so doing, we risk ignoring the fact that human activity outside that box—housing, economic development, transportation, and so on—has a far greater impact than environmental policies within the box.

In a similar way, climate action and climate policy are sometimes conflated with and potentially used as proxies for sustainable development. While action to mitigate climate change impacts and to adapt to a changing climate can help tackle multiple challenges to sustainability, governments, corporations, and other organizations attempt climate action while pursuing economic growth, presumably to pay for, among other things, protection of the natural environment.

For example, climate mitigation pathways (e.g., reducing greenhouse gas emissions, adopting technology efficiencies, and decarbonization policies) are prevalent in governmental and organizational policies in an effort to reduce and eventually eliminate the contribution of fossil fuels in energy production.[6] However, in some cases these are only "end-of-pipe" solutions while we avoid dealing with the root causes; preventative low-carbon strategies need to be part of systemic transformation.[7]

Finally, sustainability has become linked to the concept of socio-ecological ***resilience***, a concept first introduced by the renowned natural scientist C. S. Holling in 1973, that refers to the ability of a system to absorb disturbance after a sudden shock or a continuous stress, manage change, and reorganize while still retaining its function, structure, identity, and feedbacks.[8]

Research psychologist and global thought-leader Judith Rodin argues that resilience enables people, communities, and organizations to better withstand disruptions and to improve their current systems and situations.[9] Resilience enables people to build new relationships, take on new endeavors and initiatives, and reach out for opportunities that may have never been imagined before. Entities with a ***resilience deficit*** experience greater impact from disruptions, recovery takes longer, and their options are reduced. Entities that invest in resilience experience lesser impacts from disruptions, recover faster, and their opportunities expand—this is a ***resilience dividend***.

While moving in the same direction, the concepts of sustainability and resilience are vying for the same definitional space. Sometimes resilience emphasizes adaptation to the impacts of unsustainable practices while sustainability focuses on redressing these impacts and preventing them in the future.[10] However, "in a resilient social-ecological system, disturbance has the potential to create opportunity for doing new things, for innovation and for development"[11] while valuing diversity and natural and social capital.[12] In this respect, resilience supports sustainable development by recognizing the need for whole-systems decision-making.[13]

WHY CARE ABOUT SUSTAINABILITY?

One need only watch the daily news to get the idea that sustainability is of concern globally, as well as locally (see Chapter 2). In the media, issues like climate change are usually linked to images of extreme forces of nature: hurricanes, floods, droughts, fires, and migrating disease vectors, to name a few. Our current geological

age, the ***Anthropocene***, is marked by the detrimental impact of human (*anthro*) activity on the planet's ecosystems, evidenced by:

- increased frequency of natural disasters resulting from climate change;
- the decline of ecosystem viability, the spread of invasive species, and the unprecedented rate of species extinction; and
- pandemics and the spread of deadly viruses often linked to practices such as industrial agriculture, deforestation, and trade of exotic species.

In turn, these ecological impacts contribute to socioeconomic inequalities, a lack of access to basic necessities, and increasing climate refugees. Taken together, the Earth may soon not be able to sustain growing human populations and associated economic activity while maintaining ecological and social well-being.[14]

The notion of our planet's ***carrying capacity*** considers the degree to which natural ecosystems can remain viable while continuing to provide critical resources to support human populations. In November 2022, the global human population reached 8 billion. The United Nations (UN) projects that it will reach 9.7 billion by 2050,[15] which may be untenable in terms of food production, the availability of land and resources for human use, and the ecological integrity of undeveloped land.

Scholars have long warned us about the possible implications. Almost 200 years ago, English economist Thomas Malthus argued that unabated growth will eventually cause all populations to succumb to famine and disease. In their 1972 classic, *Limits to Growth*, Meadows et al. pointed out that while populations grow exponentially, the technology to increase resource efficiency only grows linearly.[16] Therefore, we must establish limits to physical growth and extraction industries that deplete natural resources beyond their capacity to renew.

In recent years, proposals for no growth, decoupling economic growth from environmental degradation, and even ***degrowth*** (e.g., transforming production and consumption patterns in high-income societies) have been put forward, albeit not without debates on whether such paths are feasible, desirable, or even adequate to achieve sustainable outcomes.[17] Alongside these proposals, there is the discourse on continuing on our current path more sustainably through limited growth. Herein, we identify practices that both redress previously problematic growth and enable sustainable growth within ecological limits (also see Chapter 2).

The argument for limited growth is strongly supported by current research on exceeding planetary boundaries.[18] Geographer Jared Diamond explained that population pressures in combination with fragile ecosystems and myopic political institutions have led many civilizations to collapse in the past.[19] Other scholars have explained that Earth is a complex closed system; thus, ***thermodynamics*** pose limits, which, if exceeded (by depleting resources faster than they regenerate year after year) will lead to collapse.[20]

As many argue, we need to perceive human beings as part of this closed system. For example, social ecologist Murray Bookchin eloquently argued decades ago that we must create an ecological society in harmony with nature.[21] Recently, the People's Republic of China set a policy to create an "ecological civilization" through which people would live well within the ecological limits of planet Earth.[22]

Nonetheless, for convenience and clarity, we will discuss humanity and nature as distinct parts of the *whole* ecosystem.

One way to consider human impact on natural ecosystems is to consider our ***ecological footprint***; the natural resources on which we draw to sustain our population and systems of production.[23] Nonrenewable resources such as fossil fuels and minerals must be conserved until they are replaced with alternatives, while renewable resources can provide goods and services (e.g., food, clean water, energy) in perpetuity if managed sustainably.[24] Furthermore, the ecosystem must be able to absorb or eliminate by-products of production, such as pollutants and emissions (e.g., the atmosphere's ability to regulate the planet's climate).[25]

The ecological footprint tool compares human demand for resources to the renewable resources available on Earth.[26] It estimates the amount of land in global hectares (gha) required for human demand by totalling the area providing these renewable resources (cropland, grazing land, fishing grounds, forest area), the area of built infrastructure, and the area needed to absorb waste (carbon demand on land).[27] Similarly, the Earth's ***biocapacity*** is also measured in gha that represent an average of bioproductive capacity, i.e., the renewable ecological goods and services available for consumption.[28]

Scholars estimate that, in the 1970s, humanity entered a state known as ***ecological overshoot***, i.e., consuming more resources than ecosystems can regenerate and producing more waste than can be absorbed. The Global Footprint Network calculation considers each natural resource as a form of capital being drawn down through use, then measures the newly regenerated portion of the resource, which is conceptualized as ***resource interest***.[29] When use exceeds interest, we enter a state of overshoot; in ecological footprint terms, we are appropriating carrying capacity from "distant elsewheres"[30] and "eternalities,"[31] meaning future generations. In 2022, Earth Overshoot Day occurred on July 28. The current rate of global ecological overshoot triggers consequences such as rapid climate change.[32]

A large portion of the overall ecological footprint is generated by ***greenhouse gases*** (GHGs), which (with the exception of chlorofluorocarbons, or CFCs) are naturally occurring compounds in our atmosphere. In order of abundance, GHGs include carbon dioxide, water vapor, methane, nitrous oxide, ground-level ozone (a component of smog), and halocarbons such as CFCs and other synthetic gases.

Carbon dioxide (CO_2) is part of the natural ***carbon cycle*** i.e., the biogeochemical cycle by which carbon moves between the atmosphere and all living beings. Atmospheric carbon primarily originated from volcanic activity and the exchange of carbon between the atmosphere and the oceans.[33] While some spheres release more carbon than they absorb, others act as ***carbon sinks*** that absorb more than they produce, like forests and oceans. Over the past 10,000 years, carbon has been at relatively stable concentrations in the atmosphere, allowing human civilization to flourish.

The abundance of CO_2, however, is only half the climate change story. Gases like methane and nitrous oxide are far more effective at trapping heat than others, e.g., CO_2. As well, some gases reside in the atmosphere much longer than others: CFCs, for example, remain for about 100 years, compared to about a decade for methane. Differences in absorption rates

and residence time coupled with different levels of relative abundance in the atmosphere make it difficult to determine the relative contribution of the various gases to climate warming. As a matter of convenience, when speaking of CO_2 levels in the atmosphere, scientists usually assume that the other gases are being considered too.[34] The bottom line is that humans are producing far more GHGs than our ecosystems can absorb.

The global ***carbon footprint*** currently sits at 60 percent of the global ecological footprint.[35] Carbon emissions are directly linked to climate change—a thorny and seemingly intractable problem. Compounding the problem is that GHG emissions are produced by sources that are as numerous as they are diffuse. Unlike the problem of ozone-layer depletion, which was substantially addressed through relatively painless phase-outs of ozone-degrading substances, climate change demands fundamental and sweeping long-term changes in how we organize our lives and develop our communities.

The UN Intergovernmental Panel on Climate Change (IPCC) developed a widely used set of five emissions scenarios that present possible trajectories for the Earth's temperature over the next 100 years.[36] IPCC predicts that, unless deep reductions in GHG emissions occur soon, along with global warming exceeding 2°C in the 21st century, the frequency and intensity of related extreme phenomena will exponentially increase, with impacts on human and natural systems.[37] It is expected that every region will increasingly experience concurrent and multiple changes with every increment of global temperature increase. Such changes and impacts include:

- decreases in permafrost, snow, glaciers, and ice sheets will result in the continuation of current trends of sea level rise, increased frequency and severity of flooding events, acidification and eutrophication of fresh and saltwater sources, and overall alteration of water cycles;[38]
- severe weather events such as heavy precipitation, tsunamis, and droughts will more frequently occur in most regions in North America, Africa, Asia, and Europe;[39]
- many areas (such as coastal cities or arid communities) are more likely to experience compound events, e.g., concurrent heatwaves, wildfires and deforestation, droughts or extreme rainfall, and sea level rise;[40]
- extreme heatwaves, deteriorating air quality, and migrating pest and disease vectors will pose significant health risks in all regions;[41]
- continuing shifts in ranges of plants and animals poleward; for example, species of North American birds have shifted their breeding colonies further north as traditional habitats become increasingly inhospitable;[42] and
- increasing temperatures and extreme weather events, compounded by plant and livestock diseases, will have detrimental effects on agricultural production over the long haul.[43]

Meanwhile, national, and international efforts like those of climate conferences in Copenhagen (2009), Cancun (2010), Paris (2015), and Glasgow (2021) have shown little success at controlling, let alone reducing, emissions. Such conferences are chronically hamstrung by controversy over differentiated responsibilities, the level of financial support to developing countries, technology transfer limits, and trade subsidies and sanctions.[44]

Since the 2015 Paris Agreement to keep a global temperature rise this century below 2°C above pre-industrial levels and pursue efforts to limit it to 1.5°C, little progress has been made. For example, despite the recently adopted and much-anticipated Inflation Reduction Act in the U.S., which pledges significant climate investments to reduce GHG emissions by half by 2030 (below 2005 levels), it is estimated that the investment is not sufficient to reach the goal and that more action is needed.[45]

Scientists agree that global average temperature has already increased by approximately 1.0°C above pre-industrial levels and, on our current path, will likely reach the 1.5°C increase shortly after 2030,[46] and could increase by as much as 2.8°C by 2100.[47] Although the precise nature of the impacts will be studied for years to come, the temperature gains are now expected to be irreversible, with long-lasting impacts.

Climate change may well be the defining issue of our time; it is already putting our food and water in jeopardy, threatening our health and well-being, and increasing competition between nations over access to resources.[48] As António Guterres, UN Secretary-General, remarked in Glasgow: "Our addiction to fossil fuels is pushing humanity to the brink. We face a stark choice: either we stop it, or it stops us. It's time to say, 'Enough […] We are digging our own graves.'"[49]

THE PATH TO UNSUSTAINABILITY

Arguably, based on this overview of Earth's carrying capacity, environmental crises are the most prominent shared existential threat; without coordinated corrective efforts, we face global natural calamities. We live quite literally on the brink of destruction due to "serious compromise of the biosphere."[50] The impacts are evident not only in the continuing trend of record-breaking global surface temperatures (2015, 2016, 2017, 2019, and 2020 were all record-breaking years);[51] impacts are also felt locally in the water, soil, and forests necessary to sustain life:

- acidification and eutrophication of fresh and saltwater sources;
- rising sea levels and severe weather events;
- deforestation and soil degradation due to mass agricultural production and fossil fuel energy production and use; and
- micro earthquakes linked to hydraulic fracturing for natural gas.

"One-planet living" or "one-Earth living" keeps consumption within Earth's carrying capacity. We currently consume at the rate of 1.75 planets on a global annual basis.[52] If we attempted to bring all nations up to North American living standards, we would require the equivalent of *8* planets.[53] As World Resources Institute founder James Speth warns, "If you take an honest look at today's destructive environmental trends, it is impossible not to conclude that they profoundly threaten human prospects and life as we know it on the planet."[54]

We are definitively on an unsustainable trajectory. The human *condition* has become a *predicament*: a devastating political and economic system has led us to the brink of ecological catastrophe that reveals the delicate balance of the ecosystem, what political theorist William Connolly characterizes as "the fragility of things."[55] The impacts cannot be isolated; these crises threaten everyone but disproportionately impact Global South nations and low-income communities of color.[56] They create

widespread disruption on our socioeconomic systems[57]—exacerbating the economic and social crises of sustainability in a cycle of ongoing deterioration.

How did we arrive at this state of ecological overshoot and climate change? The answers are found in the combined result of intersecting *human* systems: how we use and impact the environment, how we engage in economic production, and how we manage the use and distribution of resources through social and political processes. The following subsections unpack why and how our current systems are unsustainable in environmental, economic, and social terms, demonstrating how these problems manifest in our daily lives.[58]

Unsustainable Environmental Systems

Many biologists argue that a sixth mass extinction is already underway, one that is driven by human activity.[59] At this point in global history, human beings are quickly becoming an endangered species themselves. "Some people think we can survive by organizing nature, by finding species of trees and plants that can live despite pollution—producing new species through genetic engineering, or some other means. They think that we could industrialize our world so much that nature itself is industrialized."[60] Yet, these methods are part of the path to unsustainability in the first place.

The fundamental human uses of natural resources include agricultural production, extraction for manufacturing and energy production, and land development for habitation (see Chapter 2). IPCC estimated that human land use for agriculture (to feed a growing global population) and forestry (including commercial use) directly impacts more than 70 percent of the global ice-free land surface and leads to loss of natural ecosystems and declining biodiversity.[61] In addition to affecting climate change, extraction practices and energy production also wreak havoc on biodiversity at local, regional, and global levels.[62]

Unsustainable Agricultural Production

While there is growing concern over genetic and biotechnological engineering of food, animals, and people,[63] the most basic concerns are around how we produce food. The Green Revolution of the 1960s and 1970s promised to improve agricultural production and yields through intensive practices utilizing a combination of large-scale heavy machinery planting methods, hybrid high-yield seeds, and high levels of petroleum-based pesticides and nitrogen-rich fertilizers; all were packaged by global North agribusiness and promoted and distributed by government-led extension programs around the world, backed by governmental financial incentives.[64]

Despite producing higher crop yields in the short term, these large-scale agricultural practices actually reduce the productivity of farmland over the long term through erosion, contamination, and chemical burn that destroys the soil's organic richness and increases CO_2 releases from microbial denitrification.[65] Impacts such as soil degradation, eutrophication (excessive nutrients) of waterways that causes toxic algal blooms in critical water sources, loss of biodiversity, spread of invasive species due to global agricultural production and trade practices, and smog compromise the health of both local and global ecosystems.[66]

In response, the transnational agro-industrial complex is doubling down on its

practices through genetically modified organisms (GMOs) that often transfer genes across bacteria, animals, and plants in order to more tightly link seed, fertilizer, pesticide, and herbicide packages.[67] Scientists argue that by exposing pests and weeds to small amounts of the pesticide in the plant itself, they will develop resistance. No one can predict the long-term consequences of these fabricated transgenetic species.

Similarly, industrial farm animal production (IFAP) that seeks to maximize profit by raising food animals in highly compact and often enclosed environments (concentrated animal feedlot operations, or CAFOs) results in increased use of antibiotics and production of animal waste, polluting surrounding soil and water.[68] These high-density operations also place unsustainable pressures on land and water resources to feed the livestock, resulting in nutrient depletion in topsoil, soil erosion, and global deforestation;[69] they have a larger cumulative impact on global warming than the transportation sector.[70] Lastly, such practices also perpetuate social and economic inequities through agribusiness competition with smallholder farms.[71]

Unsustainable Natural Resource Extraction

In the last few centuries, particularly since the industrial revolution and more recently with the sharp rise of human population, we have been extracting natural resources for human sustenance (and often luxury) at unprecedented rates. Natural resource extraction for production of goods and services, such as food, energy, apparel, building construction, and transportation, includes wood logging and mining of hydrocarbons and other minerals and materials from the earth. Since 1900, material resource extraction from the biosphere has multiplied to sustain ever-higher living standards and consumption patterns in the industrialized world, resulting in decreasing capacity of natural resources to restore and regenerate and in increasing volumes of waste, both highlighting humanity's unsustainable methods.[72]

The use, for example, of hydraulic fracturing, a drilling method to reach oil and natural gas trapped in shale deposits, triggers microearthquakes, which have increased in areas with historically low risks and become more severe with deeper wells.[73] Along with extraction of oil from tar sands and long-distance, large-capacity pipelines, contemporary resource extraction has profound health impacts on local communities and wildlife populations through soil and water contamination.[74]

The burning of these fossil fuels for energy produces a great deal of CO_2. However, in many parts of the world, forests are being felled for fuel, timber, paper, and pastureland, releasing even more CO_2 and destroying valuable carbon sinks. These practices threaten the capacity of our ecosystems to provide the environmental goods and services we rely on for survival.

Unsustainable Energy Sources

Energy is used in all types of manufacturing, transportation, climate control in buildings, operating information technology (from our everyday work and organizational servers to digital currency mining),[75] and household functions like lighting and cooking. To generate energy, natural resources must be extracted as described earlier and transformed through mechanical processes creating emissions that

damage land, water, and air quality, in turn harming ecosystems and human health.

For example, ground-level ozone produced by industrial emissions can inhibit photosynthesis in plants, exacerbate human health problems, and contribute significantly to climate change.[76] Sulphur dioxide, emitted from industrial processes, is a primary cause of acid rain that damages plants, forests, and crops as well as structures and materials and can provoke or exacerbate health issues.[77] Biomass burning and fossil fuel combustion can increase susceptibility to viral infections such as influenza, irritate the lungs, and cause bronchitis and pneumonia. Low-level exposure to carbon monoxide from motor vehicles may exacerbate heart disease and compromise brain function.[78]

The exponential rise of GHG emissions because of human activities (except water vapor which is influenced by average temperatures) enhances heat retention and causes further warming of the planet. This phenomenon is known as the ***greenhouse effect***, a direct result from the agricultural practices previously described, deforestation, biomass and fossil fuel burning, the use of CFCs in manufacturing and refrigeration.[79] Although the concentrations of CFC-11 and CFC-12 are now slowly declining in the atmosphere, other halocarbon gases are, in the meantime, still contributing to global warming.[80]

Ecological impacts of large-scale hydroelectric dams are often met with public outrage, while nuclear power generation is expensive and radioactive waste management is problematic. As easily accessible deposits of nonrenewable energy resources are depleted, resource extraction will extend to areas (such as the Arctic) where environments and communities are more sensitive and susceptible to the damaging effects of resource extraction. We must shift to renewable sources that are cleaner, reliable, and widely available (see Chapter 6).

Unsustainable Economic Systems

North America is part of a ***capitalist economy***, meaning that the factors of production—including natural resources, labor, financing, and operations—are owned by private actors who seek profits above all else. Capitalist economies depend on supply and demand in markets for the exchange of goods and services.[81] These economic activities are regulated by governments in varying degrees, thereby linking the two in an overall ***political economy***. This is the basis for terms like ***neoliberal capitalism***, which emphasizes market freedom and leadership from the finance sector.[82]

The purpose of economic markets is to produce and exchange goods and services that are necessary to sustain life or desirable to improve its quality. Contemporary capitalistic economic models encourage societies to continue to extract and consume global resources at a rate faster than they can be regenerated and to utilize efficiencies and techniques that cannot always compensate for ecological destruction. Unstainable environmental outcomes are a problem of political economy and the way markets influence politics.

Despite the growing understanding of the widespread harmful impacts of mass food and energy production and distribution, such practices continue to be driven by an economic model based on the assumption of limitless growth.[83] This assumption and the current technological and financial practices encounter today both internal structural limitations and

an external crisis in the form of limited natural resources, particularly the waning supplies of nonrenewable energy.[84] Today, these issues "acquire an urgency unimaginable just a generation ago."[85]

In addition to how natural resources are used in production (see Unsustainable Environmental Systems), there are two other basic ways economic systems can be unsustainable in environmental and social terms: in how things are distributed among consumers and how they are produced through the capital-labor relationship.

Distribution and Consumption

Unsustainable contemporary economic systems have led to inequitable distribution and ever-increasing socioeconomic gaps based on comparative wealth in terms of Global North and Global South, developed and developing countries, and urban and rural areas. This was first shown in the 1980s: the poorest fifth of the world's population had less than 2 percent of the world's economic product while the richest fifth had 75 percent; and the 26 percent of the world's population living in developed countries consumed between 80 and 86 percent of nonrenewable resources and 34 to 53 percent of food products.[86]

Inequitable resource distribution is linked to inequitable distribution of costs and impacts, seen in environmental injustices due to air, water, and land pollution from pipelines or other industrial infrastructure built close to areas with predominantly Black, Indigenous, and People of Color (***BIPOC***) populations, as well as blatant appropriation of land and resources from such marginalized populations. These injustices are perpetuated through emerging approaches such as ***disaster capitalism***—expressed today as pandemic/COVID-19 capitalism—that promote economic growth, technology, and big data as the ultimate solutions to recovery from a crisis, as opposed to changes to the economic system itself.[87]

The ***material footprint***, an index measuring raw materials extracted to meet final consumption demands, varies greatly across countries and income levels. In 2017, it was approximately 27 metric tons per capita in high-income countries but only 2 metric tons per capita in low-income countries.[88] Likewise, the wealthiest 20 percent of global population consumes 80 percent of global resources with similarly disproportionate environmental impact (e.g., high emissions, pollution, material demand).[89] The United States and Canada also have high ecological footprints: while the global average is just 2.8 gha, they consume about 8.1 and 8 gha per capita annually.[90] The United Arab Emirates and Qatar top the list with 8.9 and 14.7 gha per person, respectively. Global South nations are overall lower consumers of energy and materials than those in the Global North.

Viewed through this lens, the population question takes on new dimensions; a woman in India would need to have ten children to match the resources consumed by one American child.[91] People around the world are starting to consider that the population problem in the Global South is less significant a problem than over-consumption and wasted resources in Global North. Demand for a quality of life determined by Western standards of material wealth results in mass harvesting of natural resources by large corporations and considers the impact to be ***externalities***, costs not quantified and included in cost-benefit calculations. Nicholas Stern, former chief economist at the World Bank, called climate change the largest

market failure in history;[92] climate change costs are externalized by producers and consumers to billions of people globally who suffer rising sea levels, droughts, floods, devastating storms, and depleted water resources.

Most contemporary critical theorists see advanced capitalism driving or exacerbating this human condition, and many characterize the globalizing process as an "Economization of the World"[93] through which all forms of social relationship become transactions with an economic or market-like character.[94] As such, many feel globalization "is increasingly forcing us to live in an economy rather than a society"[95]—the result is an "economic polity" as opposed to a political economy.[96] Indeed, the citizen's role in government has almost disappeared—we have become little more than "citizens of corporate-nations."[97]

Ostensibly, individuals are free to consume as they choose. However, "the dynamics of consumption actually render the individual more rather than less vulnerable to control."[98] Attention to power dynamics illuminates the reality that producers are in control of market exchange, thereby demonstrating the promise of consumer autonomy is merely rhetorical manipulation.[99] The market-oriented policies and rhetoric of neoliberalism therefore increasingly obscure concentrated power within the globalizing market while creating a visible, though false, sense of individual empowerment.[100] The "choices" offered are disempowering because desires are artificially fabricated and multiplied, often drowning out authentic needs.[101]

Economic disparities across regions and within nation-states are often strongly correlated with race and ethnicity, and those who have faced histories of slavery and colonialism are often disproportionately impacted by economic crises.[102] The global economy is increasingly interconnected with a "complex interplay" of market forces and financial institutions that allow financial crises to spread at unprecedented rates.[103] Contemporary market globalism is led by institutions created in the aftermath of World War II and the Great Depression that have played pivotal roles in expanding the global market through their loan conditions.

As the history of these organizations suggests, the current global economic system is ideologically grounded in free trade and nation-states are no longer "the overwhelmingly dominant actors on the world stage."[104] The reallocation of economic policy power toward IGOs, NGOs, and corporations erodes nation-state sovereignty and raises deep democratic concerns. Such organizations are able to influence trade agreements and loans that are conditional upon the implementation of austerity measures such as public spending cuts, privatization of public goods and services, deregulation, and reduction or elimination of trade barriers. These policies and agreements often reinforce global power imbalances, destabilizing Global South nations while empowering multinational corporations and securing ***hegemonic***, or total control, by the Global North.[105]

Capital-Labor Relationship

Within capitalist economies, short-term profit-seeking practices have also led to financial and social inequality in North America and globally, with workers' rights violations and an ever-widening income gap.[106] The savings from efficient technologies often are reinvested in CEO and stockholder profits or more growth instead of "trickle-down economics" to workers

and consumers.[107] As an example, a 2022 report by the Canadian Centre for Policy Alternatives showed that Canada's 100 highest-paid CEOs recorded their second-best year ever for compensation in 2020, making 191 times more than the average worker wage in Canada.[108]

Despite indications of strengthening economic markets in some countries, the global economy is arguably in the worst condition since the Great Depression as the capital-labor inequalities are worsening with the increasing gap between rich and poor "sometimes called 'global apartheid.'"[109] The global financial crisis (GFC) of 2008 and the following recession are simply the most recent evidence of the fundamental flaws of the assumptions underlying capitalism: limitless natural resources, progress, and growth.[110] Yet, despite the devastating global impact, capitalism's adherents have steadfastly refused to step back and question these assumptions, or capitalism itself. Indeed, recession responses like "too big to fail" bailouts, regulatory capture, and ongoing failures in corporate governance continued to fuel power and merely exacerbated economic asymmetries and injustices.[111]

Instead of diversifying socioeconomic perspectives and aiming to reduce disparities, capitalist globalization tends to homogenize cultures in the model of atomistic self-interest; "It is an ideology that defines basic expectations about the roles and behaviors of individuals and institutions."[112] Advanced capitalism uses fear of strong centralized control and the globalization wave to become a hegemonic force for deregulation and the hollowing out of governments,[113] resulting in "deregulation as a form of freedom" in which "global corporatism and the 'utopia' of unlimited consumption prevail."[114] Such market rhetoric "obscures how it itself requires a very large state to support and protect its preconditions of being."[115]

This hegemonic argument is difficult to deny as the key actors in globalization and the push toward international governance include the World Bank, the International Monetary Fund (IMF), various UN economic development initiatives, the Organisation for Economic Co-operation and Development, and the G-20 summits.[116] These organizations wield strong influence over public policy and ask that states demonstrate *good governance*, i.e., "transparency and accountability in government, economic liberalization and privatization, civil society participation, and respect for human rights, democracy and the rule of law."[117] Typically, though, the expected role of government to ensure "the rights of outside suppliers of equity finance to corporations are protected and receive a fair return"[118] results in forcing capitalist market policies on populations regardless of whether such economic and governance structures are culturally appropriate or desired.

Today's economic crises are not recent phenomena: in 1929, public intellectual Henry George wrote that it was both unconscionable and mystifying that poverty could perpetuate and even worsen amidst the overall growth of wealth.[119] Many would agree that postwar capitalism has led us even further down this regressive road. Scarcity, self-interest, competition, and the ensuing greed, corruption, and government austerity threaten markets, governments, and civil society alike. According to George, poverty persists because the means of production—land, labor, and capital—are privately owned and there are asymmetries of power.[120] In order to increase profits for the owners of

land and capital, market exchange is increasingly competitive, demanding ever-higher prices and volumes from consumers while providing ever lower wages to labor. Public administration theorist Frederick Thayer noted that capitalism is but another symptom of the more "generic" problem of hierarchy and its system of subordination.[121] Relational sociologist Pierpaolo Donati similarly argues that capitalism frames the "institutional order of the whole society,"[122] and William Connolly adds that neoliberalism "*inflates the self-organizing power of markets by implicitly deflating the self-organizing powers and creative capacity of all other systems*."[123]

In the wake of failing communism and socialism, many resign themselves to a lack of any viable alternatives to this capitalist model and its attendant liberal democracy.[124] Challenges to its utilitarian assumptions are dismissed as "audacious" and "hopeless" simply because they represent "reforms which would interfere with the interests of any powerful class."[125] Indeed, capitalism advocates argue its political economy is the only or best type of self-organizing and self-regulating system.[126]

Connolly suggests that because of these systemic beliefs, the 2008 GFC produced a sort of cultural disbelief—*How could government and the market allow this to happen?*[127] But he argues that with more participants in various social movements making a critical account of neoliberal capitalism, we may be at a turning point in political economy quite similar to where religion stood before the Enlightenment and where the physical sciences stood as the Newtonian system began to collapse into quantum and complexity theory. The Next System Project initiative may be one such indicator.[128]

Because policymakers still adopt capitalist and neoliberal strategies, sustainability initiatives are sometimes used for greenwashing, demonstrated by the fact that the fossil fuel industry had the biggest delegation in both the COP26 and COP27 climate summits.[129] Capitalism and the pursuit of economic growth cannot solve the problems they create.[130] Despite windows of opportunity such as the GFC, the annual climate conferences, or the 2020 (and ongoing) pandemic, such economic downturns have still not resulted in necessary shifts in thinking and practice.

Socioeconomic and environmental justice demands that we balance economic development goals with the needs of the vast majority of the human population—the poor. Contemporary calls for equity emphasize that human inequality is bad for environmental quality and a sustainable future.[131] This means we can no longer rely on our 200-year tradition of material growth and trickle-down benefits as the primary instrument of economic policy. Bold global and local action is required, with social equity policies targeted at narrowing the gap between the wealthy and the poor.

Unsustainable Social Systems

Sustainability requires environmental and economic work to be undertaken with attention to social equity as well. Unsustainable environmental and economic systems have negative implications for social sustainability, but there are basic causes of inequitable outcomes that lead to social crises in developed and developing countries alike. Social crises have myriad driving forces, e.g., histories of slavery, colonization, and genocide; competing worldviews; growing income disparities; corporate control of natural

and economic resources; and dominating relationships between governments and the governed. Of the wide range of possible responses, mass protest, violent conflict, and international military actions are the most visible.[132]

Systemic and structural inequities in how political power and economic and environmental costs and benefits are distributed in society are often based not only on income but on social identities, particularly for BIPOC populations and those who are marked as generationally impoverished (such as white Appalachians).[133] The most recent example is the unequal access to vaccines against COVID-19 globally.[134]

Another cause of unsustainable social systems particularly in modern Western culture is what Donati calls "institutionalized individualism."[135] Others describe the sociological impact of this ideal as ***individualization***.[136] Indeed, postmodern society is experienced as "'paradoxical community': a community made by people without any real community."[137] Amidst such isolation, fruitful coexistence is difficult to achieve. Nor can a collective culture be fabricated through our standard attempts to balance freedom and control through social contract.

Globalization of the economy and technological advances mean that we are becoming more interconnected. We are "increasingly tied to others, including at the level of world-wide networks and institutions,"[138] but there is "a general feeling that communication is breaking down everywhere, on an unparalleled scale."[139] The global "ethic of individual self-fulfillment and achievement" is fracturing all other forms of community.[140]

In many respects, we are less connected than ever before and have fewer skills to communicate shared meanings. Our capacity for actual *dialogue*—the listening and sharing that enables mutual understanding—is decreasing.[141] Instead, individuals seek out other like-minded individuals to connect with, creating what online organizer Eli Pariser describes as a "you loop" in which individuals use social media to foster groupthink while avoiding or attacking those who adhere to different political positions or worldviews.[142] The result is increasing political polarization.

However, it must be noted that there is also tremendous potential inherent in communication technologies to foster common ground and support for community action and social movements by bringing together a wider range of individual voices and experiences as seen in revolutionary actions such as the Arab Spring and resistance movements such as Occupy Wall Street and Black Lives Matter.[143] Still, such movements are often more successful in linking individuals of common perspective to organize oppositional politics than engaging individuals in genuine dialogue across differences to help resolve social disparities.

This tendency may be tied to culture. For instance, discussion in Western cultures typically aims to break up or analyze ideas rather than to find interconnections, potentially because Western languages and worldviews actually disable our abilities to be open, withhold judgment, and allow shared meanings to emerge.[144] We use adversarial modes of deliberation and debate to proliferate our own understandings while resisting or refusing the understandings of others.[145] As social agreements about everything from language meanings to identity and political ideology break down, the human condition is rapidly becoming that of the *frag-*

mented individual[146]—an isolated and decentered self that is steering away from its authentic identity. Proliferating identity politics thus serve to divide and separate individuals across various characteristics while broadly inclusive communities disappear. As a result, society is rife with conflict; these conflicts become amplified rather than seeking out commonalities across our differences.[147]

To address the paradoxical situation in which the individual is rhetorically empowered while disempowered economically, socially, and politically—where communication technology is advancing means of self-expression while mutual understanding between individuals is atrophied—we must seek a "posthuman politics" that recognizes the primacy of relation, interdependence, and *life* writ large.[148] Because we still waver among eternal or lifeless ontologies, feminist theorist Rosi Braidotti argues:

> Our public morality is simply not up to the challenge of the scale and complexity of damages engendered by our technological advances. This gives rise to a double ethical urgency: firstly, how to turn anxiety and the tendency to mourn the loss of the natural order into effective social and political action, and secondly, how to ground such an action in the responsibility for future generations, in the spirit of social sustainability.[149]

While social movements are often specific to particular place, people, or interest, new social movements share a trend toward solidarity.[150] These calls for direct democracy within increasingly globalized networks of social movements create a new sense of world citizenship. Individuals are beginning to see themselves as interconnected within "a borderless world."[151]

THE PATH TO SUSTAINABILITY

Based on this overview of our current context, sustainability cannot simply mean to maintain the systems we currently have—the current systems are failing. Sustainability of human and natural ecosystems requires transformative changes to ensure that all communities and future generations will have access to the same environmental benefits that current generations have enjoyed. This is a significant but achievable challenge! As we can see from the previous discussion, the root causes of unsustainability are well within our collective control. But to take on this challenge, we must recognize our collective vulnerability and mobilize our communities to use sustainability as a problem-solving tool.

Nobel prize-winning economist Elinor Ostrom's groundbreaking work on sustainable socio-ecological systems illustrates the complexity of a system's components and their relationships and interactions.[152] Environmental, economic, and social crises of unsustainability are mutually influencing, often coalescing to harm the most vulnerable simultaneously. This vicious cycle can make us feel powerless and apathetic about the future. Nonetheless, we must use this knowledge and approaches such as the Groundwater approach to inspire action: the metaphor of the fish, the lake, and the aquifer that feeds the lake is used to differentiate potential levels of analysis of individuals, communities, and societies.[153] Environmental, economic, and social disparities stem from systemic hierarchies (i.e., the aquifer); therefore,

sustainability ultimately requires addressing the aquifer—the social and political systems that either hinder or foster environmental and economic sustainability for all.

Policy and planning recognize the complex and deeply interdependent issues that comprise the sustainability crisis as "wicked problems" that are potentially both symptoms and causes of others and for which there are no "definitive and objective answers."[154] Because of their complexity and tendency to escape jurisdictional borders, wicked problems demand coordinated responses and sustainability governance in the pursuit of long-term well-being for all living beings.[155] A new paradigm is needed—through degrowth or drastically limiting growth, action for food sovereignty, respect or restoration of Indigenous land rights, locally/cooperatively owned production, and many more strategies that will be discussed in Part 2.

Based on what we know about unsustainable development, sustainable development must address all three critical systems—environmental, economic, and social—that are inextricable from one another in any local or global system. These components are usually conceptualized as a three-legged stool, a three-pillar edifice, or an overlapping Venn diagram (Figure 1.1).[156] This approach has been influenced by economist Edward Barbier's description of the sustainable economic development process as the interaction among economic, biological, and social systems and by business writer John Elkington's ***triple bottom line*** concept as a management and accounting method.[157]

These threefold frameworks have the potential to align the concept of sustainable development with Indigenous Peoples' worldviews. Their ecological worldviews of living systems and their stewardship of Mother Earth are the original approach to sustainability; they include both people and nature and strive for well-being optimization for both.[158] Indigenous and Aboriginal communities worldwide use local ecological and traditional knowledge to guide resource management and community decision-making.[159]

Furthermore, the Seven Generations principle held by many Indigenous Peoples centers intergenerational justice and sustainability.[160] The principle is presented in two different ways depending on tradition: while the Haudenosaunee embrace thinking for at least seven

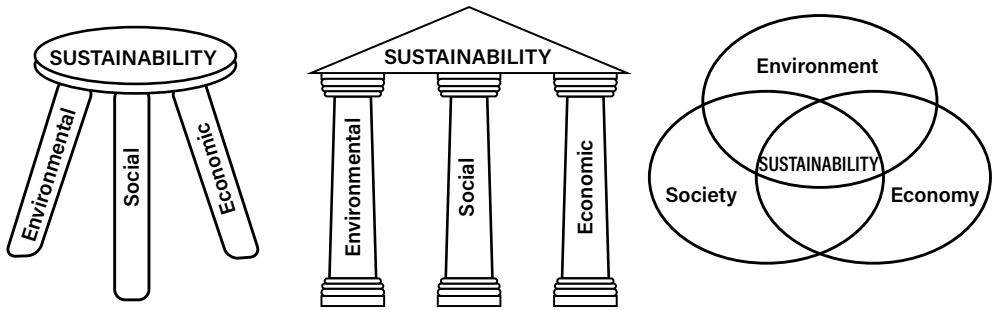

FIGURE 1.1. Threefold Sustainability Frameworks. (Source: Spiliotopoulou and Roseland, "Urban Sustainability: From Theory Influences to Practical Agendas.")

generations into the future,[161] other Indigenous Peoples hold that the current generation must learn from the experiences of three past generations, seek to meet the needs of the current generation, and anticipate the needs of three generations ahead.[162]

Environmental, economic, and social objectives must be placed within a comprehensive framework that allows identification of parallel objectives and reduction of harmful tradeoffs. This systemic approach can help reposition humanity as part of natural ecosystems (not apart from them) and promote restoration of ecosystems and biodiversity on which the community (and its economic development) rely.[163]

Emerging concepts and frameworks support such analysis. Under development by multidisciplinary scientists since 2011, the notion of ***consumption corridors*** advocates ensuring everyone is able to live well within planetary limits.[164] Figure 1.2 shows the "***doughnut economics***" framework, economist Kate Raworth's useful conceptual tool to help decision makers ensure social and economic

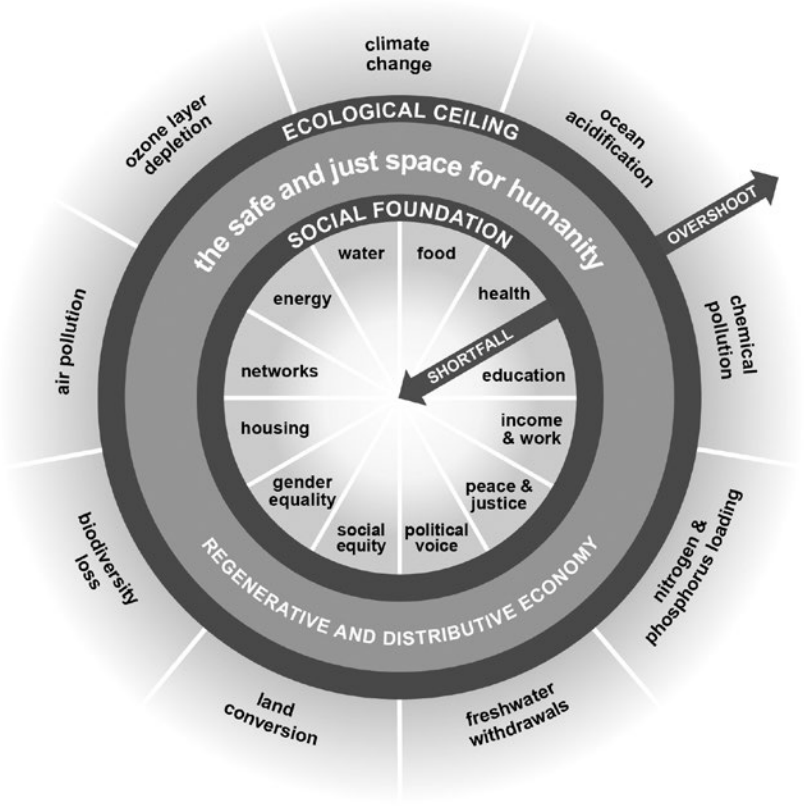

FIGURE 1.2. The Doughnut Economics Framework.
(Source: DoughnutEconomics, *Doughnut* [Economic Model].)

quality of life (meeting everyone's basic needs as the inner circle of the doughnut) within planetary ecosystem boundaries (outer circle).[165] This framework converges the planetary boundaries research with the just sustainability approach and the need for human-nature equity and Indigenous and racial justice.[166]

What Kind of Sustainability?

In the early 1990s, economists such as Herman Daly and David Pearce considered how to conceptualize sustainability in economic terms. They asked what it would mean for each generation to leave a stock of assets at least as great as that which they had inherited themselves. There are two possible ways to pursue this: ***weak sustainability*** and ***strong sustainability***.[167]

Weak sustainability implicitly aggregates all types of assets, reflecting the neoclassical economics assumptions that nonnatural assets can be substituted for natural assets and depleting natural assets is not problematic if profits generated provide an equivalent endowment to the next generation. This suggests natural capital stock could be destroyed if the benefits of doing so are very large or if the social costs of conservation are unacceptably large.[168] It also begs a key question: Are we even capable of knowing the full costs and benefits of destroying or conserving natural assets?

In contrast, strong sustainability recognizes that, in most cases, nonnatural assets cannot be substituted for natural assets because irreversible processes (e.g., species extinction or ecosystem destruction) mean that the former cannot be converted back into the latter. Strong sustainability recognizes that whatever the level of human-made assets, an adequate stock of natural assets is critical in securing sustainability.[169]

Based on these considerations, Daly, Pearce, and others began insisting that, in making policy decisions, we must differentiate between assets that are natural and those that are not.[170] This principle heightened awareness of the field of ***ecological economics***, which aims to address the interdependence and coevolution of human economies and natural ecosystems. It differs from environmental economics, the mainstream economic analysis of the environment, by virtue of its treatment of the human economy as a subsystem of the natural ecosystem (hence the limits to growth and technology) and its emphasis upon preserving and regenerating natural resources.[171] Its adherents argue that strong sustainability is the way forward and that natural resources cannot be simply conceptualized as a monetized input to the economic system.[172]

Our present "green" orientation toward sustainability is basically about tweaking our existing policies to be less environmentally harmful. If sustainability is to become a process with the power to transform rather than reform systems, economic and social justice need to be integrated at the very core. The concept of ***just sustainability*** bridges the "environmental quality–human equality" divide and implies a paradigm shift that requires a redistributive function in sustainability practice.[173] In short, a truly sustainable society is one where wider questions of social and economic equity are addressed without exceeding planetary ecological limits.

The emerging field of ***sustainability science*** aims to support this effort through an inte-

grated approach to six capacities of measuring sustainable development, promoting equity, adapting to shocks and surprises, transforming the system into more sustainable development pathways, linking knowledge with action, and devising governance arrangements that allow people to work together in exercising the other capacities.[174]

The UN 2030 Global Agenda for Sustainable Development has been a significant step toward strong, just sustainability by providing the Sustainable Development Goals (SDGs), a holistic framework for nation states and other organizations to walk the path of sustainability.[175] The bottom line is that we must learn to live within the limits of our natural resources and their renewable income as illustrated by the doughnut economics framework. Sustainable community development (SCD) therefore requires that we minimize our consumption of essential (and especially nonrenewable) natural resources globally *and* at the local level, as discussed in Chapter 2.