Key Features of Contemporary Global Challenges

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2.1 Introduction

The premise of this report is that the world faces significant challenges; many of which can be defined as complex or "wicked problems"(Rittel & Webber, 1973) defying simple, convergent solutions and analysis. This report argues that the arts and cultural sectors can help address these challenges.

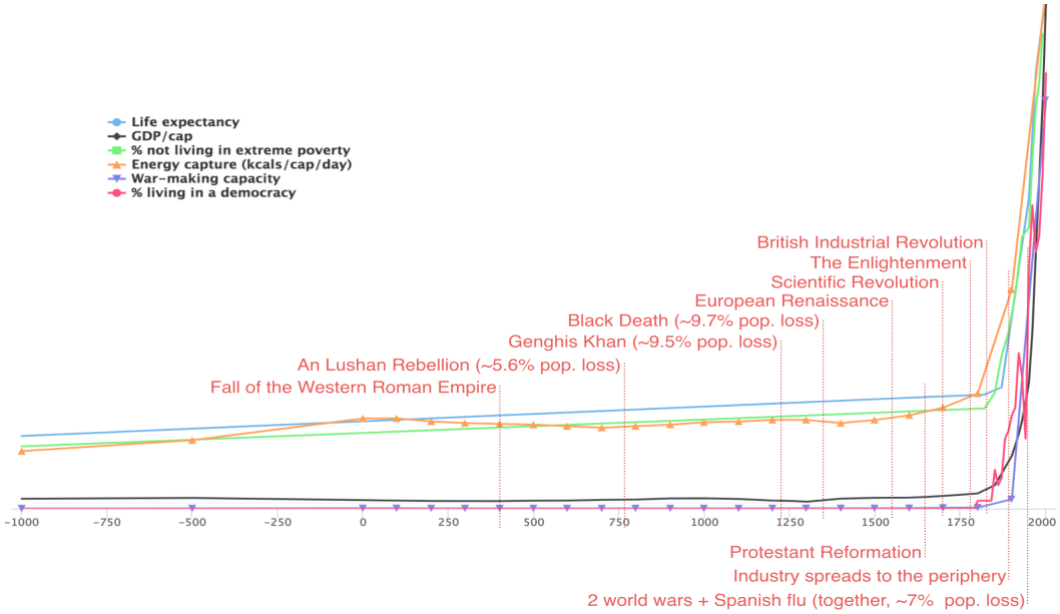
The state of the world is a subject of lively debate, entertaining widely differing opinions as to its trajectory. The 20th Century, and the beginning of the 21st have seen some of the greatest changes in human history, whether at the social, technological, or ecological level. While humanity has made unparalleled progress and reached great heights of development (Pinker, 2011), it also faces a growing number of challenges, many of which are complex, and some of which may even be existential (Bostrom, 2002).

In this section we ask ourselves the following questions: What are some of the major challenges being faced by the world today? What can we say about these challenges, in terms of their nature and general features? What kind of approaches might we need to address them? To answer these, we draw from academic literature and reports by institutions focusing on global issues.

2.2 The state of the world and some of its key challenges

The world of the 20th and early 21st Century is the result of an exponential rise in growth, GDP, technology, knowledge creation, and population size – unparalleled in human history (Figure 1). At the same time, this development has been accompanied by challenges of sustainability and resilience affecting society and the global ecosystem. These concerns are at the top of the global agenda today, and are raising questions about the very future of humanity (Bostrom, 2002; McLaughlin et al., 2021; UN, 2015; WEF, 2021).

Figure 1 : Trends across human history and indicators of health, wealth, energy usage, war and democracy from 1000 BC to 2000 AD (Muehlhauser, 2017)



2.2.1 Global successes

It is important to briefly acknowledge some of the major successes of the modern era. This is not only to present a balanced account of the state of affairs, but also because a number of our current challenges are linked to the same factors that created our progress. Our weaknesses are often the shadows of our strengths.

The end of the 20th century and the beginning of the 21st century have been defined by the rise of globalization, population growth, the continued rise of private enterprise, and rapid technological developments. This period has seen a sharp rise in computerization, applied technology and data in most realms of business and life (Ignat, 2017). Medicine and public health have continued to flourish, leading to a net reduction in mortality and communicable diseases, and an increase in lifespans (Hanlon et al., 2012). Literacy rates and overall education levels have continued to rise. There is less absolute poverty and hunger. GDP has risen exponentially over the last two centuries, though more steadily in the last few decades (Pinker, 2011). Access to information has risen exponentially, particularly through the internet and smartphones. Wars between countries, and overall battle-related deaths have been on the decline since the Second World War (Roser, 2016a). More women have entered the workforce than ever in history (Ortiz-Ospina et al., 2018), and there is relatively greater representation of historically oppressed minority groups in the economy and in political spheres(Protsyk, 2010). Overt colonialism and imperialism ended, though, as highlighted in postcolonialist studies, enduring legacies persist (Young, 2016). Democratically elected political systems began to overtake authoritarian ones by the beginning of the 21st Century(Roser, 2019). There was a growing belief that globalized society had solved most of its pressing problems. Following the fall of the Soviet Union, Francis Fukuyama famously hailed the “end of history” (Fukuyama, 1989), underlining the successes of Western liberal democracy. In terms of industrial and scientific progress, E F Schumacher notes the popular (and erroneous) belief at the time that the “problem of production” had been solved thanks to technology and the modern industrial system – the main limiting factor was demand (Schumacher, 2011).

The rate of progress has not been constant over this period. The most exponential and paradigm-shifting changes in the last two centuries took place in the late 19th – mid 20th century. This included the World Wars, the Age of Science and Mass Production, the Digital Revolution, and the tremendous developments in medicine, agriculture, and communications. The tail end of the 20th century, and the beginning of the 21st arguably saw a consolidation of the developments that preceded them, but also a greater awareness and experience of systemic limitations, challenges to assumptions of progress and growth, criticisms of the dominant models of development, and tensions in the social fabric. Many of these challenges are at least partly linked to the very progress of the last two centuries. For example, productivity and growth raise questions regarding resources, environmental impact, and consumption rates. These concerns are further explored below.

2.2.2 Global challenges

We explored expert reviews of global challenges from the Millennium Project, the World Economic Forum's Global Risks Report, Oxford University's Future of Humanity Institute and Cambridge University's Centre for the Study of Existential Risk (Bostrom, 2002; McLaughlin et al., 2021; Millennium Project, 2017; WEF, 2021), as well as several studies on specific subtopics from climate change to global debt. Based on this analysis we propose five broad categories of global challenge. They pertain to i) the environment, ii) the economy, iii) technology iv) human health, and v) social systems, cohesion, and peace. All of them are deeply interwoven, and include crosscutting issues such as inequality and legacies of conflict and oppression.

The environment

Environmental concerns, including climate change, biodiversity loss, and resource depletion are probably the most critical and existential challenges of our era (Beard et al., 2021; Bradshaw et al., 2021).

Anthropogenic, human-led climate change is now an established fact (Beard et al., 2021; Bradshaw et al., 2021; UN, 2015). It is largely related to the externalities of society's development, with greenhouse gas emissions and land use causing the majority of effects, including extreme weather events, rising sea levels, melting ice caps, floods and draughts, biodiversity loss, public health crises, agricultural crises, mass migration and land loss. The most recent expert review warns of a "ghastly future", noting that temperature rises will be higher than previously estimated, that global changes are nowhere near sufficient to mitigate these effects, and that most climate related Sustainable Development Goals are off track (Bradshaw et al., 2021).

The extent of biodiversity loss in the 20th Century is such that a growing number of scientists identify it as the sixth mass extinction in world history, the "Anthropocene"(Lewis & Maslin, 2015). These effects are linked to humans encroaching on natural habitats, human

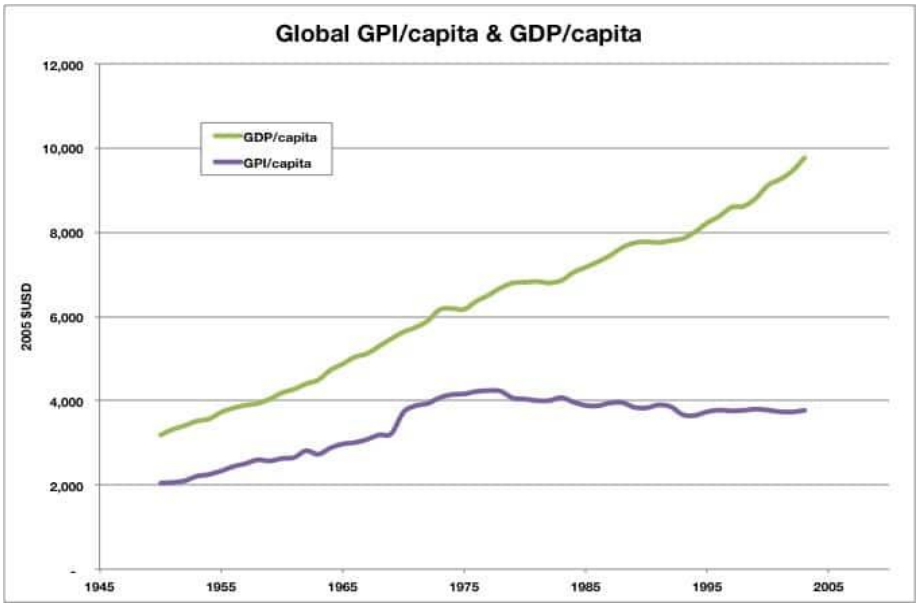
consumption rates, urbanization, pollution, and primary resource depletion (Bradshaw et al., 2021). Noting that "our relationship with nature is broken", the World Wildlife Fund calculates a 68% drop in wildlife populations between 1970-2016 (WWF, 2020). Material extraction of natural resources including water has tripled over the past five decades, while the global population has doubled. This extraction is accelerating, and accounts for 90% of biodiversity loss, water stress, and half of our climate change impacts (UNEP, 2020). Energy usage has continued to rely on traditional fossil fuels (notably oil, coal, and gas), of which more are burned every year. Decarbonization of the world economy is taking place too slowly (UNEP, 2020).

Humanity's consumption is a major factor to this challenge, exacerbated by inequality. The global population has doubled since 1970, and though rates of fertility and growth are changing in different parts of the world, the areas that are growing fastest, combined with uneven resource distribution, poor economic development, and climate change are also the most likely to suffer food and resource crises (Eggel & Galvin, 2021). As a result, despite modern agriculture, 700-800 million people were estimated to be starving in 2021, and 1-2 billion malnourished (Bradshaw et al., 2021). Global consumption is currently at 170% of the Earth's regenerative capacity(Bradshaw et al., 2021), though consumption needs are thirteen times greater in high-income countries than in low-income ones (UNEP, 2020).

The Economy

Global wealth creation continues to rise, while other indicators of progress, wealth inequality, and sustainability signal major concerns. Economic indicators such as Gross Domestic Product (GDP) have risen exponentially through the 20th Century and continue to rise. However there is evidence to suggest that the modern economic system is also vulnerable to crises, leads to expanding inequality of wealth distribution, and is currently experiencing its most significant crisis in peacetime (WEF, 2021). Figure 2 compares GDP to the Genuine Progress Indicator (GPI), a sustainability measure that estimates "net wealth" by accounting for costs such as resource depletion and environment footprints (Kubiszewski et al., 2013). It shows a stark difference, and suggests declining net wealth since the 1980s, largely due to the increasing costs of economic growth to society and the environment.

Figure 2: Gross Domestic Product vs Genuine Progress Indicator between 1945-2005 (Kubiszewski et al., 2013)



Inequality is one of the greatest concerns with the global economy. Though between-country inequality is on a relative decline, it has steadily increased since 1990 in most developed countries and some middle-income countries, including China and India, accounting for over 71% of the worlds population (UN, 2020). Despite progress in some countries, income and wealth are increasingly concentrated at the top. The share of income going to the richest 1 per cent of the population increased in 59 out of 100 countries between 1990 to 2015 (UN, 2020). Credit Suisse Global Wealth Report calculates that the world's 1% own over 43% of the world's wealth (Shorrocks et al., 2020). The International Labour Organization consider that income inequality is "far greater than previously thought"(ILO, 2020), with key differences playing across gender, urban/rural, and age divisions. Unemployment is projected to rise over the short term, exacerbated by the current pandemic(ILO, 2020; WEF, 2021). Inequality also affects unemployment. Though there has been a global decline, it is mostly in high-income countries, while middle- and low-income countries have undergone employment crises. In all countries, access to jobs is no guarantee of "decent work", with a rise in contract work and informal work, and an accompanying reduction in workers' conditions protections and rights. Low wages for the majority hamper the ability of the most vulnerable, particularly in low-income countries, to move out of extreme poverty. Unemployment and poor conditions affect women, marginalized groups and youth the most severely(ILO, 2020; UN, 2020).

Furthermore, global debt is a significant crisis to contend with, ranked by the World Economic Forum as one of the highest impact risks in 2021 (WEF, 2021). Rising debt across the world has been further worsened by the COVID pandemic. Not only have "three debt waves ended in financial crisis for emerging and developing economies" since 1970, but debt-to-GDP ratios rose to over 200% following the last global financial crash in 2008. This "ballooning debt" will lead to record level of public debt through the 2020s, leading to devalued currencies, lower relative buying power of low- and middle-income countries, and a deeper unemployment crisis (WEF, 2021).

These various factors underline issues related to the sustainability, resilience, and real benefits of the current economic system, and raise questions about its appropriateness and changes that may be needed to best meet the needs of the world (Piketty, 2018; Stiglitz, 2019).

Technology

We are still in the early phases of the Digital Age, often hailed as the Fourth Industrial Revolution (WEF, 2021), with an exponential rise in the application of technology to all spheres of activity. But this digital boom is accompanied by issues of unequal distribution and digital divides, resource depletion, the many dangers of Artificial Intelligence (AI), as well as power imbalances and security concerns.

The world is increasingly reliant on technology and the internet, and the professional and educational sectors are rapidly shifting online (a trend boosted by the current pandemic). However, this also worsens the digital divide, further disempowering those who do not have adequate access to technology. As always, this imbalance is greatest in populations that are already disadvantaged, exacerbating longstanding inequalities along ethnicity, gender, age and socio-economic lines (Plan International, n.d.; WEF, 2021).

The environmental impact of the digital revolution is significant (Liu et al., 2019), both in terms of energy usage, and resource depletion. This is further exacerbated by companies that do not follow principles of the circular economy (Stahel, 2016), but rather on business models of perpetual growth.

The most serious challenges regarding technology may be those related to artificial intelligence, data and security. Artificial intelligence (AI) is consistently featured as one of the world's top existential risks(Bostrom, 2002; Mecklin, 2021; WEF, 2021). The accidental or intentional misuse of AI or other forms of technology including nanotechnology, biotechnology, and big data, all present critical risks that could affect security, privacy, decision-making, and weapons development. Though it is unclear to what extent automation will reduce overall jobs, these developments also deepen existing technological inequalities and digital power divides. Big data, social media and AI are already having immense influence on economic, social, and political behaviors, being connected to socio-political echo chambers, increasing polarization and depression, influencing elections and economic choices (Berghel, 2018). This eagerness to speed up the development and usage of technology may be the ultimate Faustian bargain. Nick Bostrom of the Future of Humanity Institute notes that in front of the prospect of an exponential rise in artificial intelligence, we are like children facing a bomb (Adams, 2016).

Human health

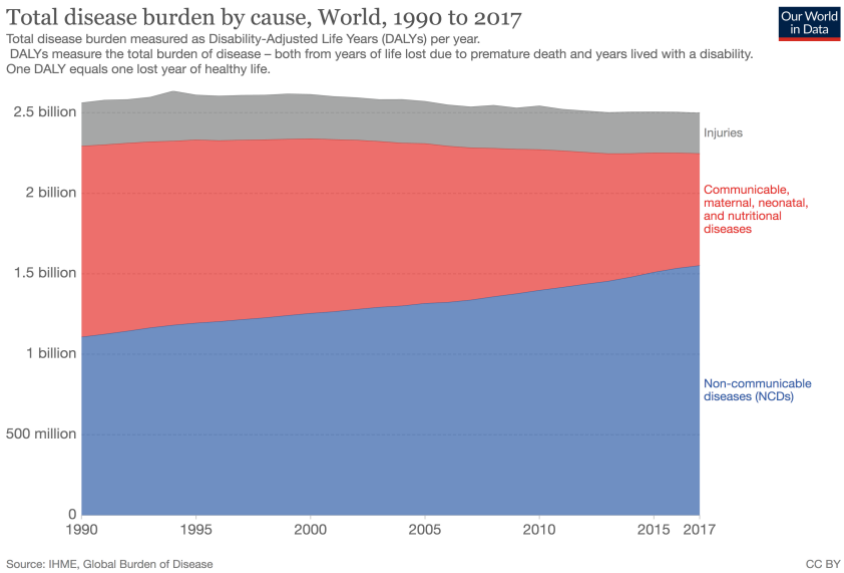
Though health has improved according to many metrics, particularly communicable diseases and all-cause mortality, the overall burden of disease has not changed drastically in the last three decades (see Figure 3). Rather, it has followed an "epidemiological transition" to non-communicable diseases including cardiovascular disease, cancers, respiratory illnesses, and diabetes (GBD 2015 Risk Factors Collaborators, 2016; Hanlon et al., 2012). Some experts have asked whether we are living longer but sicker lives(Angel et al., 2015; Hanlon et al., 2012).

Though the prevalence of communicable diseases is decreasing, the confluence of climate change, greater urbanization and population density, pollution, human-animal encounters due to encroachment and depleting wilderness, and more connected global populations

(Bradshaw et al., 2021) is greatly increasing the risks of epidemics and pandemics (Bradshaw et al., 2021; Costello et al., 2009). Together, these present some of the most significant existential global risks to humanity (Bostrom, 2002; Costello et al., 2009; WEF, 2021). The current pandemic is a prime example, along with an estimated 70% of new infectious diseases which are all linked to animals, including HIV, SARS, H5N1 bird flu, and Ebola (Carrington, 2021).

Equally concerning is the growing mental health crisis (Rehm & Shield, 2019; Vigo et al., 2016). Rates of depression, loneliness and suicide are rising across the world. Important questions have been raised about definitions of health, about what constitutes true and holistic wellbeing, and whether the dominant global system provides the best solutions to achieve this. Some public experts have gone so far as to say that the mental health crisis is linked to a crisis of modernity (Hanlon et al., 2012). The rise of mental health concerns, non-communicable diseases, and risks of epidemics underline the major questions that remain to be answered in global health, including the aims of health –focusing on healthy cultures and wellbeing rather than disease management (Hanlon et al., 2012).

Figure 3: The epidemiological transition. Communicable, non-communicable and injury-related mortality over three decades (Roser & Ritchie, 2016)



Social systems, cohesion, and peace

Social and political unrest is a defining feature of the early 21st Century. It is expressed in many ways, from interstate conflict and state- based violence to mass displacements and political polarization. These various sources of unrest and conflict compound existing inequalities and legacies of colonialism, violence, discrimination against women and minority groups, racism, and sociopolitical exclusion.

While overall deaths from all conflicts have decreased following the Second World War, civil conflicts have been on the rise ever since, reaching historic highs in the past decade while

peace agreements have been declining (Palik et al., 2020). Drawing on a large dataset of over a million violent events, the Armed Conflict Location & Event Data Project finds a global rise in political violence, together with a drastic increase in political demonstrations (ACLED, 2021).

Conflicts, economic crises, and climate change are creating a perfect storm of migration and displacement. Indeed, the last decade has seen the most displacement in recorded history (UNHCR, 2019). This has in turn led to political tension in countries receiving migrants and refugees, fanning polarization and populism around questions of identity and demographic change. In a globalized world, identity politics are not limited by confines of nation states of even regions, causing international movements and instability. Globalization has also boosted organized crime, which has diversified, reached "macro-economic proportions" and become transnational (UNODC, 2010). Economic crises, inter-state and intra-state inequality, organized crime, mass migration and globalization have also contributed to modern slavery, which is a multi-billion dollar industry, disproportionately affecting women and children (Davidson, 2015; Kara, 2017).

The world is also moving into a new phase of geopolitics, with multiple poles and a change in global norms of engagement. The growing economic power of countries like China and India, amongst others, has led to a shift in global power dynamics. "International relations now play out in increasingly diverse ways: beyond conventional military build-ups, these include new cyber sources of hard and soft power, reconfigured trade and investment linkages, proxy conflicts, changing alliance dynamics and potential flashpoints related to the global commons"(WEF, 2018).

The state of affairs can be summarized by a sobering update by the Bulletin of Atomic Scientists. The Bulletin has issued public warnings about existential catastrophe since 1945 via their "Doomsday clock", framing the likelihood of collapse as the number of minutes to "midnight". Citing climate change, nuclear weapons progress, rising conflicts, the threat of AI and a "worldwide governmental trend toward dysfunction", with poor "institutional and political capacity for dealing with these threats", the clock in 2021 was a mere 100 seconds to midnight – the closest it has ever been(Mecklin, 2021).

Figure 4: State-based conflicts since 1946 (Roser, 2016b)

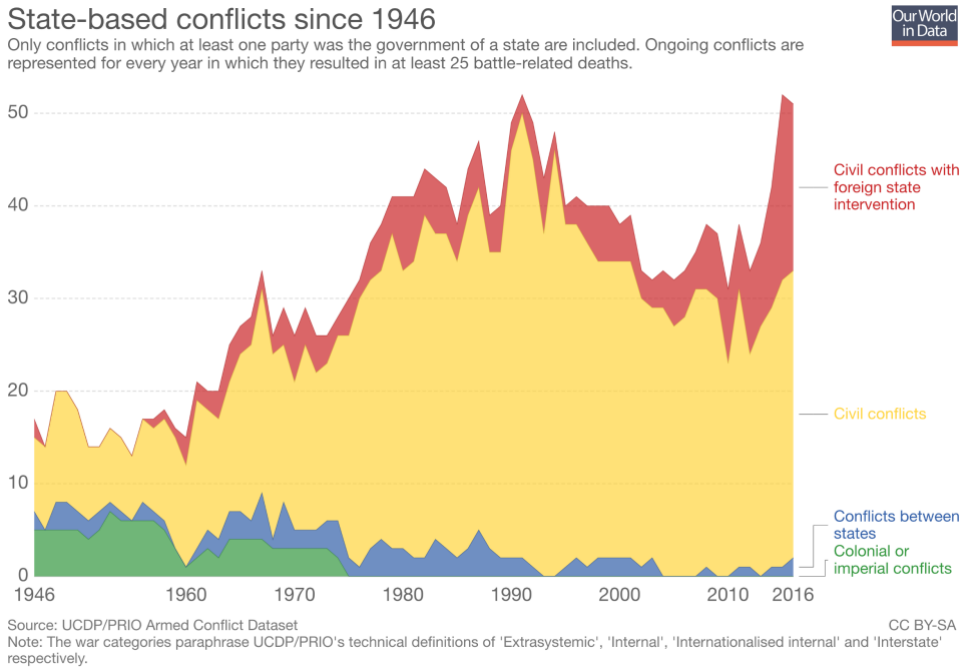
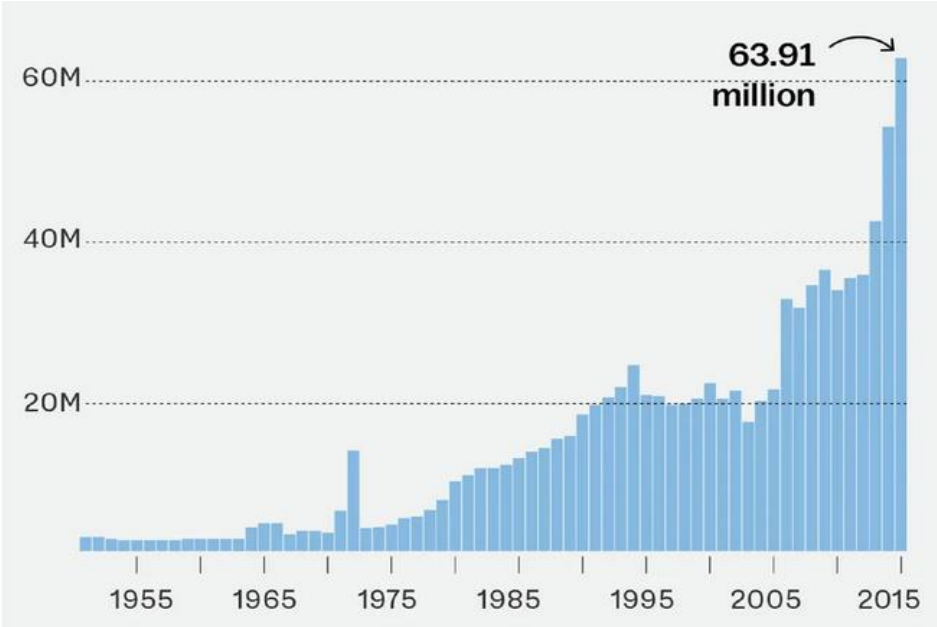


Figure 5: Global number of refugees, asylum seekers, internally displaced persons since 1955 (Beauchamp, 2017)



2.3 Key features of these global challenges

What are some cross-cutting features of the challenges examined in the previous section? What can be said about their nature? We find four common elements to these challenges, including: inequality as a transversal issue and effect multiplier; the limits of growth and unidirectional development actions; their interwoven, complex and systemic nature; a sociological underpinning based on behaviors, choices and policies.

Inequality

Inequality is a core issue of our time. The very title of the 2020 World Social Report includes the word, which, it claims, has moved "to the forefront of the policy debate". This is because the "extraordinary economic growth and widespread improvements in well-being observed over the last several decades have failed to close the deep divides within and across countries"(UN, 2020).

Inequality is a standalone issue as well as an effect multiplier. It is an important parameter to understand all the global challenges discussed above, as their impacts are far more significant when stratified by gender, race, ethnic group, socio-economic level, or age, amongst other factors. Ultimately, the disenfranchised and vulnerable suffer the most. Probing the nature of this disenfranchisement brings us to inherent inequalities in modern capitalism (Piketty, 2018), legacies of violence, discrimination and oppression; elitism, colonialism, racism, and sexism (Austin, 2010; Hout, 2021; Lempert & Nguyen, 2011; UN, 2014). This underlines a wider concern, which is the stratification of society at large. The extent to which a society is divided and unequal is a measure of its instability and lack of sustainability. In an increasingly globalized, interrelated world, inequality is an important impediment to overall development, and a critical factor to unrest and conflict (UN, 2020). Indeed, some researchers suggest that inequality has been an important contributor to historical instances of societal collapse (Levitt, 2019; Motesharrei et al., 2014; Turchin, 2007).

Limits to growth

In one way or another, most global challenges relate to limits and systemic constraints. The limits of production and consumption; resource usage and regeneration; urbanization and wildlife; industrial outputs and pollution; socio-political inequality and exclusion, competition, and cohesion.

This concern was well captured in "The Limits to Growth" (already half a century ago) warning against unbridled growth in a world with limited resources (D. H. Meadows et al., 1972). The report predicted a peak in production and growth around 2020, followed by a

rapid decline in production, population size, as well as ecological and economic stability. While it is subject to criticism, 30- and 40-year reviews suggested that the data match the model relatively well(D. Meadows et al., 2004; Randers, 2012; Turner, 2008).

Complexity and interconnected systems

A key feature of these challenges is their interwoven, systemic, and complex nature. The wider and more interconnected the system, the more complex its behavior. This is the case in a world that is fast becoming a single global unit, and where humanity's impacts are increasingly global in nature. Complex systems are distinguished by having large webs of interconnectivity, leading to new properties arising from these relationships. They apply to all ecosystems, from physical and environmental systems, to socio-economic and political ones (Anand et al., 2010; Cilliers, 2002; Harrison, 2012; Sun & Yang, 2016). A

As discussed further in section 3.1 and in the memo written by Emily Forsythe Queen, many of our modern challenges can be viewed through the lens of systems theory, be it climate change (Anand et al., 2010; Sun & Yang, 2016), social unrest (Cilliers, 2002), or inequality (Markey-Towler & Foster, 2013). Systems theory speaks of simple, complicated, complex and chaotic elements (Snowden & Boone, 2007), all of which are arguably at play in our modern global challenges (section 3.1, EFQ 2021). This is supported by the Organisation for Economic Co-operation and Development which recently published a report on systems thinking for addressing complex global challenges, arguing that to address "planetary emergencies linked to the environment, the economy and socio-political systems, we have to understand their systemic properties, such as tipping points, interconnectedness and resilience"(Hynes et al., 2020).

A notion related to complex systems is that of "wicked problems"(Zellner & Campbell, 2015). The term was defined by Ritter and Webber, criticising the scientific approach to solving issues related to social problems. They have also been applied to several other issues, including sustainability and climate change (Brønn & Brønn, 2018; Sun & Yang, 2016; Zellner & Campbell, 2015). Wicked problems do not have simple right or wrong answers, and involve complex interdependencies. They require an appreciation of the whole, of interrelations, of context, and of relationships (Brønn & Brønn, 2018).

The challenges we have examined have elements of both complex and wicked problems. They are deeply interwoven, have interrelated components, and show emergent properties whereby the whole is larger than the parts. Climate change increases likelihood of conflict, which in turn feeds into greater international migration (Abel et al., 2019). In turn, rising conflict and insecurity, climate change and economic shocks (including those related to the COVID-19 pandemic) increase global food insecurity and hunger (FSIN & Global Network Against Food Crises, 2021). A recent report backed by the G7 countries examines the "economics of biodiversity", drawing a clear relationship between economic growth and natural resource depletion. It considers our unsustainable behavior to be failures of the underlying premises behind markets and institutions, calling for changes in "how we think, act and measure success" (Dasgupta, 2021). It also underlines the importance of education and greater experiential connection to Nature, to not only improve "health and well-being, but also help empower citizens to make informed choices and demand the change that is needed"(Dasgupta, 2021).

Inner problems with outer effects

Though they are expressed “externally”, which is to say in the outside world, these challenges are fundamentally “internal” human problems. It is important to understand that conflict, climate change, resource depletion, AI creation, are not inevitable natural phenomena; they are based on individual and collective choices, behaviors and actions. Recognizing this, reports and initiatives addressing these challenges invariably conclude with the importance of shifts in awareness, behavior and policy(Mecklin, 2021).

This raises critical questions around what influences these “human” factors. Determinants of behavior are addressed in a variety of fields including psychology, sociology, philosophy, history and culture. They include dominant philosophical positions, and sociocultural frameworks that maintain those systems of thoughts. Values, contexts, and sense-making stories. They also address competing narratives, differential power, drives and pressures. It is the interaction between these different narratives and multiple perspectives through which we apprehend and make sense of the world.

2.4 Approaches to address these challenges

While we cannot claim to have clear, concrete and complete solutions to these complex, “wicked” problems, we can suggest ways of approaching them.

In the previous section, we found these issues to be: complex, systemic and interwoven; deeply affected by inequality; influenced by limits to growth and ecosystem boundaries; ultimately linked to human choices, behaviors and social systems. We can thus say that approaches to these challenges should be able to address complexity and interconnected systems; understand limits and boundaries; combat inequality; and tackle determinants of individual and collective behavior. A recent EU report on “sustainability competencies” resonates with this suggestion and complements it. It recommends different forms of thinking needed to reach the Sustainable Development Goals, notably relating to: systems, futures, values, strategies, interpersonal skills, integrated problem-solving, practical implementation skills, and intra-personal skills or self-awareness (Bianchi, 2020).

Though a detailed analysis is beyond the scope of this report, we expand on this by listing a few suggestions below. They broadly relate to complex systems and determinants of individual and collective human behavior and choices (some elements are found in both).

An approach that addresses the complexity of global challenges may need to:

- Consider context, including the boundaries and limits that keep systems healthy and in equilibrium.
- Pay attention to the broader, emergent, holistic bigger picture.

- Be trans-disciplinary and appreciate interconnectivity, interdependence and interrelations.
- Be inclusive and take different perspectives and positions into account. To go beyond the perspective of those in circles of power and dominance, and extend to our wider ecosystem.
- Use different modes of understanding and knowledge in order to grasp the full complexity. This principal is used in design thinking for example, which is often employed to solve "wicked problems" (ref). It includes modes of knowing that extend beyond rational reasoning and logic, and perspectives from different genders, minority groups, decolonization practices, and indigenous knowledge.
- Generate creative, innovative approaches and visions (Currie, 2019).

An approach that addresses the human element to these challenges, including determinants of individual and collective behavior and choices may need to:

- Be trans-disciplinary, sharing lessons between all fields of thought (including science, the humanities, religion and culture) and including multiple perspectives
- Critically examine the underlying frameworks, narratives and values related to these global challenges. This includes questions related to economic growth, and indicators of true human development, health and prosperity(Hanlon et al., 2012; Piketty, 2018; Stiglitz, 2019).
- Where necessary, help rebuild narratives, values and visions that are in line with addressing these global challenges. These use different tools and methods from widely varying disciplines and perspectives. Culture is an important paradigm and framework in this regard (Farida Shaheed).
- Connect to global challenges in different manners using multiple ways of understanding. This includes the importance of embodied and emotional understanding, which has been suggested to be a key factor to the necessary social and policy shifts for sustainability. As noted by Shrivastava, *"[s]ustainability is a holistic and a complex issue….[which]….requires integrative transdisciplinary systemic understanding [that goes beyond] scientifically accessible systems…increases awareness of the complexity and interrelationships of environmental, economic, social, political, and technical systems and also increases respect for the diversity of voice that exists amongst cultures, race, religion, ethnic groups, geographic, and intergenerational populations…" (Shrivastava et al., 2012)*.
- Develop interpersonal and intra-personal competencies including empathy, cooperation, coherence, and cohesion (this includes different fields, approaches and perspectives).

2.5 Concluding note

We propose five broad categories of global challenge, pertaining to i) the environment, ii) the economy, iii) technology, iv) human health and v) social cohesion and peace. All of them are deeply interwoven, and include crosscutting issues such as inequality and legacies of conflict and oppression.

We find four common elements to these challenges, including: inequality as a transversal issue and effect multiplier; the limits of growth and unidirectional development actions;

their interwoven, complex and systemic nature; a sociological underpinning based on behaviors, choices and policies.

We can say that approaches to these challenges should be able to address complexity and interconnected systems; understand limits and boundaries; combat inequality; and apprehend determinants of individual and collective behavior. We list a number of suggested approaches to these. Our critical examination of global challenges reveals the importance of trans-disciplinary approaches that make room for multiple perspectives and ways of knowing, and address fundamental questions related to values and sense-making narratives.

This analysis also sheds light on the role that could be played by the arts and culture sector towards addressing these challenges. As noted by the first Special Rapporteur on Cultural Rights, culture "is the core of being human: it is how we assign meaning to our lives and understand our human, natural and manufactured environment, as individuals and collectives"(Shaheed, 2014). It is part of the wider framework that encapsulates the narratives and values that determine behavior and choices. The arts help tap into different modes of understanding and perspective, stimulate creativity and insightful vision, and encourage an embodied, emotional appreciation that may also be critical to action, cohesion, and cooperation. The rest of this report is dedicated to exploring this role in more depth.

2.6 References

Abel, G. J., Brottrager, M., Crespo Cuaresma, J., & Muttarak, R. (2019). Climate, conflict and forced migration. *Global Environmental Change*, *54*, 239–249. https://doi.org/10.1016/j.gloenvcha.2018.12.003

ACLED. (2021). *ACLED 2020: The year in review* (The Year in Review). Armed Conflict Location & Events Data Project. https://acleddata.com/acleddatanew/wp-content/uploads/2021/03/ACLED_AnnualReport2020_WebMar2021_PubUpd.pdf

Adams, T. (2016). Artificial intelligence: 'We're like children playing with a bomb.' *The Guardian*. https://www.theguardian.com/technology/2016/jun/12/nick-bostrom-artificial-intelligence-machine

Anand, M., Gonzalez, A., Guichard, F., Kolasa, J., & Parrott, L. (2010). Ecological Systems as Complex Systems: Challenges for an Emerging Science. *Diversity*, *2*(3), 395–410. https://doi.org/10.3390/d2030395

Angel, R. J., Angel, J. L., & Hill, T. D. (2015). Longer lives, sicker lives? Increased longevity and extended disability among Mexican-origin elders. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *70*(4), 639–649.

Austin, G. (2010). African Economic Development and Colonial Legacies. *International Development Policy | Revue Internationale de Politique de Développement*, *1*, 11–32. https://doi.org/10.4000/poldev.78

Beard, S. J., Holt, L., Tzachor, A., Kemp, L., Avin, S., Torres, P., & Belfield, H. (2021). Assessing climate change's contribution to global catastrophic risk. *Futures*, *127*, 102673. https://doi.org/10.1016/j.futures.2020.102673

Beauchamp, Z. (2017, January 30). *9 maps and charts that explain the global refugee crisis*. Vox. https://www.vox.com/world/2017/1/30/14432500/refugee-crisis-trump-muslim-ban-maps-charts

Berghel, H. (2018). Malice domestic: The Cambridge analytica dystopia. *Computer*, *51*(5), 84–89.

Bianchi, G. (2020). *Sustainability competences: A systematic literature review.* Publications Office of the European Union. https://data.europa.eu/doi/10.2760/200956

Bostrom, N. (2002). Existential risks: Analyzing human extinction scenarios and related hazards. *Journal of Evolution and Technology*, *9*.

Bradshaw, C. J., Ehrlich, P. R., Beattie, A., Ceballos, G., Crist, E., Diamond, J., Dirzo, R., Ehrlich, A. H., Harte, J., & Harte, M. E. (2021). Underestimating the challenges of avoiding a ghastly future. *Frontiers in Conservation Science*, *1*, 9.

Brønn, C., & Brønn, P. S. (2018). Sustainability: A Wicked Problem Needing New Perspectives. In *Business Strategies for Sustainability* (p. 17). Routledge/CRC Press. https://www.crcpress.com/Business-Strategies-for-Sustainability/Borland-Lindgreen-Maon-Ambrosini-Florencio-Vanhamme/p/book/9781138311343

Carrington, D. (2021, June 4). World leaders 'ignoring' role of destruction of nature in causing pandemics. *The Guardian*. http://www.theguardian.com/world/2021/jun/04/end-destruction-of-nature-to-stop-future-pandemics-say-scientists

Cilliers, P. (2002). *Complexity and postmodernism: Understanding complex systems*. routledge.

Costello, A., Abbas, M., Allen, A., Ball, S., Bell, S., Bellamy, R., Friel, S., Groce, N., Johnson, A., Kett, M., & others. (2009). Managing the health effects of climate change: Lancet and University College London Institute for Global Health Commission. *The Lancet*, *373*(9676), 1693–1733.

Currie, A. (2019). Existential risk, creativity & well-adapted science. *Studies in History and Philosophy of Science Part A*, *76*, 39–48.

Dasgupta, P. (2021). *The Economics of Biodiversity: The Dasgupta Review.*

Davidson, J. O. (2015). *Modern slavery: The margins of freedom*. Springer.

Eggel, D., & Galvin, M. (2021). *The Rise of Inequality and Its Contested Meanings* (Issue 9; Global Challenges: The Moving Fault Lines of Inequality). The Graduate Institute Geneva. https://globalchallenges.ch/issue/9/the-rise-of-inequality-and-its-contested-meanings/

FSIN & Global Network Against Food Crises. (2021). *Global Report on Food Crises 2021*. World Food Programme.

Fukuyama, F. (1989). The end of history? *The National Interest*, *16*, 3–18.

GBD 2015 Risk Factors Collaborators. (2016). Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990–2015: A systematic analysis for the Global Burden of Disease Study 2015. *Lancet (London, England)*, *388*(10053), 1659.

Hanlon, P., Carlisle, S., & Lyon, A. (2012). *The future public health*. McGraw-Hill Education (UK).

Harrison, N. E. (2012). *Complexity in world politics: Concepts and methods of a new paradigm*. SUNY Press.

Hout, B. (2021). *"Tackling legacies of Europe's colonial past in the wake of Black Lives Matter"—An interdisciplinary symposium*. Tackling legacies of Europe's colonial past in the wake of Black Lives Matter" - An interdisciplinary symposium. https://europe.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=2597&LangID=E

Hynes, W., Lees, M., & Müller, J. (2020). *Systemic Thinking for Policy Making: The Potential of Systems Analysis for Addressing Global Policy Challenges in the 21st Century | en | OECD* (New

Approaches to Economic Challenges). OECD. https://www.oecd.org/publications/systemic-thinking-for-policy-making-879c4f7a-en.htm

Ignat, V. (2017). Digitalization and the global technology trends. *IOP Conference Series: Materials Science and Engineering*, *227*(1), 012062.

ILO. (2020). *World employment social outlook: Trends 2020* (World Employment Social Outlook). International Labour Organization. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_734455.pdf

Kara, S. (2017). *Modern slavery: A global perspective*. Columbia University Press.

Kubiszewski, I., Costanza, R., Franco, C., Lawn, P., Talberth, J., Jackson, T., & Aylmer, C. (2013). Beyond GDP: Measuring and achieving global genuine progress. *Ecological Economics*, *93*, 57–68. https://doi.org/10.1016/j.ecolecon.2013.04.019

Lempert, D., & Nguyen, H. (2011). The global prisoners' dilemma of unsustainability: Why sustainable development cannot be achieved without resource security and eliminating the legacies of colonialism. *Sustainability: Science, Practice and Policy*, *7*(1), 16–30. https://doi.org/10.1080/15487733.2011.11908062

Levitt, M. S. (2019). The Neglected Role of Inequality in Explanations of the Collapse of Ancient States. *Cliodynamics: The Journal of Quantitative History and Cultural Evolution*, *10*(1). https://doi.org/10.21237/C7CLIO10142572

Lewis, S. L., & Maslin, M. A. (2015). Defining the Anthropocene. *Nature*, *519*(7542), 171–180. https://doi.org/10.1038/nature14258

Liu, R., Gailhofer, P., Gensch, C.-O., Köhler, A., & Wolff, F. (2019). *Impacts of the digital transformation on the environment and sustainability* (Issue Paper under Task 3 from the "Service Contract on Future EU Environment Policy"). Öko-Institut.

Markey-Towler, B., & Foster, J. (2013). *Understanding the causes of income inequality in complex economic systems*. University of Queensland, School of Economics.

McLaughlin, A., Ainscough, J., Kemp, L., & Jones, N. (2021). Earth's existential threats: Inequality, pandemics and climate change demand global leadership. *The Conversation*. http://theconversation.com/earths-existential-threats-inequality-pandemics-and-climate-change-demand-global-leadership-154325

Meadows, D. H., Meadows, D. L., Randers, J., & Behrens, W. W. (1972). *The limits to Growth*. Universe Books.

Meadows, D., Randers, J., & Meadows, D. (2004). *Limits to growth: The 30-year update*. Chelsea Green Publishing.

Mecklin, J. (2021). 2020 Statement. *Bulletin of the Atomic Scientists*. https://thebulletin.org/doomsday-clock/2020-doomsday-clock-statement/

Millennium Project. (2017). *15 Global Challenges*. http://www.millennium-project.org/projects/challenges/

Motesharrei, S., Rivas, J., & Kalnay, E. (2014). Human and nature dynamics (HANDY): Modeling inequality and use of resources in the collapse or sustainability of societies. *Ecological Economics*, *101*, 90–102. https://doi.org/10.1016/j.ecolecon.2014.02.014

Muehlhauser, L. (2017). How big a deal was the Industrial Revolution? *Luke Muehlhauser*. http://lukemuehlhauser.com/industrial-revolution/

Ortiz-Ospina, E., Tzvetkova, S., & Roser, M. (2018, March 24). *Female participation in labor markets grew remarkably in the 20th century*. Our World in Data. https://ourworldindata.org/female-labor-supply

Palik, J., Rustad, S. A., & Methi, F. (2020). *Conflict Trends: A Global Overview 1946-2019* (PRIO PAPER, p. 40). Peace Research Institute Oslo (PRIO).

Piketty, T. (2018). *Capital in the twenty-first century*. Harvard University Press.

Pinker, S. (2011). *The better angels of our nature: The decline of violence in history and its causes*. Penguin uk.

Plan International. (n.d.). *Bridging the gender digital divide*. Plan International. Retrieved May 1, 2021, from https://plan-international.org/education/bridging-the-digital-divide

Protsyk, D. O. (2010). *The representation of minorities and indigenous peoples in parliament* (Promoting Inclusive Parliaments, p. 24). UNDP / IPU. https://www.agora-parl.org/sites/default/files/agora-documents/A%20global%20Overview_The%20representation%20of%20minorities%20and%20indigenous%20peoples%20in%20parliament-1.original.pdf

Randers, J. (2012). *2052: A global forecast for the next forty years*. Chelsea Green Publishing.

Rehm, J., & Shield, K. D. (2019). Global Burden of Disease and the Impact of Mental and Addictive Disorders. *Current Psychiatry Reports*, *21*(2), 10. https://doi.org/10.1007/s11920-019-0997-0

Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, *4*(2), 155–169. https://doi.org/10.1007/BF01405730

Roser, M. (2016a, December 13). *Battle-related deaths in state-based conflicts since 1946*. Our World in Data. https://ourworldindata.org/war-and-peace

Roser, M. (2016b, December 13). War and Peace—State based conflicts since 1946. *Our World in Data*. https://ourworldindata.org/war-and-peace

Roser, M. (2019). *Number of Democracies*. Our World in Data. https://ourworldindata.org/democracy

Roser, M., & Ritchie, H. (2016). *Burden of Disease—Total Disease Burden by Cause*. https://ourworldindata.org/burden-of-disease

Schumacher, E. F. (2011). *Small is beautiful: A study of economics as if people mattered*. Random House.

Shaheed, F. (2014). *REFLECTIONS ON CULTURE, SUSTAINABLE DEVELOPMENT AND CULTURAL RIGHTS*. International Award UCLG - MEXICO City - Culture 21, Mexico City. http://agenda21culture.net/sites/default/files/files/pages/award-pages/art_FS2_ENG.pdf

Shorrocks, A., Davies, J., & Lluberas, R. (2020). *The Global wealth report 2020* (Global Wealth Report, p. 56). Credit Suisse.

Shrivastava, P., Ivanaj, V., & Ivanaj, S. (2012). Sustainable development and the arts. *International Journal of Technology Management*, *60*(1–2), 23–43.

Snowden, D. J., & Boone, M. E. (2007). A leader's framework for decision making. *Harvard Business Review*, *85*(11), 68.

Stahel, W. R. (2016). The circular economy. *Nature News*, *531*(7595), 435.

Stiglitz, J. E. (2019). *Measuring what counts: The global movement for well-being*. The New Press.

Sun, J., & Yang, K. (2016). The Wicked Problem of Climate Change: A New Approach Based on Social Mess and Fragmentation. *Sustainability*, *8*(12), 1312. https://doi.org/10.3390/su8121312

Turchin, P. (2007). *War and peace and war: The rise and fall of empires*. Penguin.

Turner, G. (2008). A comparison of The Limits to Growth with 30 years of reality. *Global Environmental Change*, *18*(3), 397–411. https://doi.org/10.1016/j.gloenvcha.2008.05.001

UN (Ed.). (2014). *Gender equality and sustainable development*. United Nations.

UN. (2015). *Transforming our World: The 2030 Agenda for Sustainable Development | Department of Economic and Social Affairs* (A/RES/70/1). United Nations. https://sdgs.un.org/publications/transforming-our-world-2030-agenda-sustainable-development-17981

UN. (2020). *World Social Report 2020: Inequality in a rapidly changing world / Department of Economic and Social Affairs.* United Nations Department of Economic and Social Affairs.

UNEP. (2020). *Global Resources Outlook 2019: Natural Resources for the Future We Want*. UN. https://doi.org/10.18356/689a1a17-en

UNHCR. (2019). *Global Trends Forced Displacement 2019* (Global Trends). United Nations High Commissioner for Human Rights. https://www.unhcr.org/statistics/unhcrstats/5ee200e37/unhcr-global-trends-2019.html

UNODC. (2010). *The Globalization of Crime: A transnational organized crime threat assessment*. United Nations Office on Drugs and Crime (UNODC). https://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=348837

Vigo, D., Thornicroft, G., & Atun, R. (2016). Estimating the true global burden of mental illness. *The Lancet Psychiatry*, *3*(2), 171–178. https://doi.org/10.1016/S2215-0366(15)00505-2

WEF. (2018). *The Global Risks Report 2018: Fractures, Fears and Failures* (Global Risks Report). World Economic Forum (WEF). https://reports.weforum.org/global-risks-2018/global-risks-2018-fractures-fears-and-failures/

WEF. (2021). *The Global Risks Report 2021 16th Edition* (No. 16; Global Risks Report). World Economic Forum (WEF).

WWF. (2020). *COVID 19: URGENT CALL TO PROTECT PEOPLE AND NATURE*. World Wide Fund for Nature. https://c402277.ssl.cf1.rackcdn.com/publications/1348/files/original/FINAL_REPORT_EK-Rev_2X.pdf?1592404724

Young, R. J. (2016). *Postcolonialism: An historical introduction*. John Wiley & Sons.

Zellner, M., & Campbell, S. D. (2015). Planning for deep-rooted problems: What can we learn from aligning complex systems and wicked problems? *Planning Theory & Practice*, *16*(4), 457–478. https://doi.org/10.1080/14649357.2015.1084360