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# INTERSECTING

VOLUME 11/2023

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"The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn."
—Alvin Toffler (1980)

That our world is growingly complex is hardly a radical revelation. The challenge is to act accordingly. To widen our knowledge, we specialize and consequently isolate ourselves in various silos.

In face of overwhelming evidence of our interrelatedness and interdependencies, from our bodies to our environment and our actions within it, we have no other choice than to work at the edges and at the crossroads.

INTERSECTING cuts through strategic policy areas across countries. It builds upon multi-sectoral, multi-disciplinary, and multi-stakeholder approaches.

INTERSECTING is distributed by the Global Solutions Initiative. It is geared towards think tanks, civil organizations, international institutions, in particular the G20/T20.
It addresses established and future generations of leaders in public and private spheres.

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Image Source: Members of the delegation of Nigeria at the World Urban Forum in Katowice make a stop of the booth of Hungary to discuss their schedule, June 2022. Image by Nicolas J.A. Buchoud, all rights reserved ©.

# preface

## The Global Editorial Project

Resources of various kinds have always been an essential prerequisite for prosperity and life. We live in a world where there is not enough wealth for many or, in other words, too much for a few. The “overfed mouths” pointed out by Martin Luther King in the 1960s are no novelty, but the issue of sharing and distribution of resources has become way more acute for a few simple reasons. First, the world of 2030 is far more populated and globalized than the one of the 1960s. Globalization of trade and investment has accelerated ceaselessly since the end of the Cold War, at least before the Covid-19 pandemic and geopolitical competition changed the rules of the game. Second, technological changes such as digitalization and increasing demographics are accelerating the race for resources. Third, climate change is demonstrating the extent to which livelihoods are under threat, while the notion of planetary boundaries has become widely recognized in the past decade, indicating geo-chemical limitations to human activities. Last, reversing the course of production overflows is a humongous challenge, exemplified by the slow progress towards a global treaty on plastics, an illustration of the complex promises of circular economy.

This INTERSECTING publication is about just that. It brings together perspectives from different disciplines and world regions to focus on these questions: What appropriate conditions should be created to regulate the consumption of natural resources of life and raw materials? How can human

resources such as skills and cooperation be improved to address degradation and well-being? This second printed volume of INTERSECTING builds on the lessons learned since the inception of this global editorial project in spring 2020, initially as a way to build responses to the Covid-19 pandemic. We believe that our common future is not yet written, and that a looming risk is the coexistence of exponentially unequal futures. Even if global temperatures continue to rise and resources become scarcer, the impacts will not be the same here and there, and depending on countries, communities or neighborhoods. While this new volume of INTERSECTING is about to be published, post-Covid-19 "recovery" trajectories are tainted by high inflation and high interest rates, with high disparities among nations and within them. A number of the countries most in need of green or sustainable investments have little or no capacity at all to raise funding from global capital markets.

Initiated in the context of the G20 Italy in 2021, the continuation of the INTERSECTING project through the G20 Indonesia and G20 India in 2022-23 has allowed us to broaden our vision of "resources" from both consumption and production perspectives. We learned from Indonesia and the ASEAN about the issues of interoperable normative systems. We learned from India, with the concept of the "LiFE economy," about how to review climate or biodiversity commitments according to lifestyles and their per capita $CO_2$ impacts. This nurtures macroeconomic transformations, including the revision of GDP and other foundations of the contemporary international monetary system, largely inherited from decisions made during the 1940s amid World War II. We believe these are the directions in which the energy of the G7, BRICS, and other concerted fora should be directed.

Economic decisions and actions span across multiple areas of society, human life and nature. They range from production to meet basic needs, to disruptive innovations, to long-term changes in social relations and living conditions on the planet. We refer here to "transformations" as a profound restructuring of systems, such as towards carbon-neutral societies and economies for the common good. Against this backdrop, the authors of this new INTERSECTING publication have devoted themselves to drafting commentaries on what is at stake and suggestions on what pathways for transformative change might look like. Yet, social capital and education losses triggered by the Covid-19 pandemic have been dramatically underestimated, and inequalities and imbalances in the production and distribution of social capital and capacities have deepened exponentially in just a few years. In many ways, deep transformations are already under way, but they will not produce shared benefits. Instead, INTERSECTING: Resources for the Future focuses on levers for transformative change and the sustainable use of resources across various fields, such as inclusion, skills, digitalization, health, work, urbanization, technologies, infrastructure, or development cooperation.

In his article, Michael Cohen focuses on inclusion and discusses how the debates about the role of cities in the global economy have evolved beyond past discussions on globalization, value chains, and digitalization. For him, the focus has shifted towards regional productivity and growth, with trade becoming more geographically specific. Cohen emphasizes the importance of social inclusion in this changing landscape, as inequality and social exclusion tend to increase during periods of change. The article suggests seven key factors to consider for promoting social inclusion: consistency, composition, conditionality, cascading crises, causation, cities, and communication. These factors are crucial for planning and policy-making in the context of evolving global economic trends.

On the subject of skills, Rainer Kern's article highlights the undervaluation of art and culture in the context of multiple crises. He argues that despite its transformative power and ability to generate imagination, art is often overlooked and considered a voluntary service. Dictatorial regimes recognize its influence and suppress it, while democratic systems fail to fully utilize its potential. Kern calls for the integration of art into socio-political, economic, and ecological change processes, since it is crucial for sustainable development. He sees potential in initiatives like "Pre-Texts" that promote art-based literacy programs to address social problems. Acknowledging and utilizing art's potential can lead to constructive and proactive action in times of complexity and change.



In his article, Mathias Janke discusses the impact of digitalization on the economy, highlighting the acceleration of information and production processes. The speed of information transfer has increased exponentially, thanks to advancements in technology. Computers and algorithms have replaced humans in tasks requiring speed and efficiency, leading to increased productivity. However, the promised age of leisure and freedom from economic concerns, as predicted by Keynes, has not materialized. Despite global wealth accumulation, the world continues to exploit resources and race forward, neglecting sustainability. For Janke, the economy remains driven by competition and the constant pursuit of growth, perpetuating inequality between developed and developing countries. Digitalization has compressed space and time, but leisure and wealth distribution remain elusive.

The conversation between Lars Lerup and Gunnar Hartmann highlights the complexity of urbanization and challenges the binary distinction between rural and urban. It introduces the concept of citification and urbanization as separate processes. Citification refers to the shift of population to cities, while urbanization encompasses cultural and lifestyle changes. The authors highlight that access to resources and the degree of urbanization vary among individuals, resulting in a relative urbanization experience. The conversation emphasizes the importance of access to city resources for city dwellers and discusses the resources available to urbanizing dwellers. The authors suggest using a heuristic

box such as Gapminder's "Life on the Four Income Levels" to capture the multidimensional nature of urbanization and bridge the gap between developing (rural) and developed (urban) areas. Overall, the conversation explores the nuances of urbanization and challenges traditional categorizations.

The article by Ramiro Albrieu discusses the role of technological innovations and global trends in shaping the future of work. Albrieu emphasizes the need for a comprehensive framework that integrates factors like technology, climate change, and demographics. The impact of these trends on work is uncertain and depends on the response of governments, firms, and households. The article highlights the differences between the Global South and Global North in terms of their capacity to adapt to technological change. Albrieu challenges us to enrich debates on the Global South's future of work by addressing technological lag, skilling challenges, informal sector impact, and inequality. The article calls for a reframing of policy debates to consider local contexts and systemic perspectives in order to create better jobs in the future.

On the subject of health, Thomas Pogge's article proposes the establishment of an international Health Impact Fund (HIF) as an alternative reward mechanism in the pharmaceutical sector. The HIF would enable pharmaceutical companies to exchange their monopoly privileges for impact rewards, encouraging the development of cost-effective treatments for diseases concentrated among the poor. For Pogge, registered products would receive annual distributions based on health gains achieved, using a common metric like quality-adjusted life years ($/QALY). The HIF aims to address moral concerns, promote global health, incentivize disease eradication efforts, and reduce costs associated with patents and marketing. Funding would initially come from states, offset by savings and economic gains. The HIF offers a cost-effective solution to improve access to medicines and enhance global preparedness against communicable diseases.

On the subject of technology, the article by Shuva Raha highlights the importance of integrating technology and circularity into the economy. Raha discusses how the circular economy can benefit both small communities and global value chains. For her, technology plays a crucial role in enabling resource efficiency, tracking and managing resources, improving processes, and involving people in the circular economy. However, there should be a balanced approach, avoiding overemphasis on technology and considering local contexts, traditions, and priorities. The integration of technology should align with sustainable consumption and production patterns and promote cooperation between countries for inclusive and sustainable development.

The conversation between Martin Pauli and Gunnar Hartmann focuses on Arup's commitment to the circular

economy through its climate and sustainability portfolio, incorporating circular principles into projects globally. They are the Ellen MacArthur Foundation's knowledge partner and have introduced the Circular Buildings Toolkit. Opportunities for circular initiatives exist in Europe, the US, and Australia. For Pauli, the EU taxonomy is a significant policy instrument, and progress is observed in both private and public sectors. However, there are regulatory hurdles, such as construction demolition material being considered waste. Denmark sets exemplary targets to ensure climate protection and sustain construction production until 2050. Achieving circularity, Pauli said, requires methodical digitalization, but current digital maturity poses challenges.

The article by Nicolas J.A. Buchoud questions what looks like an impossible global infrastructure consensus in times of rising geopolitical confrontations and still prevailing models of "infrastructure for growth" at the expanse of distribution and social justice. Yet, this is only one aspect of the complex contemporary infrastructure landscape. Nurtured by the lessons from the first INTERSECTING volume and several years of intensive cooperation across the think tanks of the G20 (T20) and G7 (T7), Buchoud advocates that the current presidencies of the G20, led by major emerging economies, have a very strong potential to enable transformations of the current world (dis)order, on two conditions. First, the vision of infrastructure systems has to change, to include physical, digital, social but also research infrastructure investments, Second, successful work at the intersections of different infrastructure systems largely depends on a high-quality dialogue between think tanks from developed and emerging countries, initiated in 2022 and strengthened in 2023 by the T20 India and T7 Japan. Finally, Buchoud echoes the long-term innovation and cooperation potential of the "LiFE economy" as introduced by the T20 India.

The article by Johannes Kummerow, Moritz Hunger, and Jörn Geißelmann emphasizes the need for global cooperation and partnerships to tackle the multiple crises and challenges facing the world, including violent conflicts, poverty, inequality, climate change, and the impacts of the Covid-19 pandemic. The authors stress the importance of the 2030 Agenda and the Sustainable Development Goals (SDGs) in guiding efforts towards a sustainable and equitable future. Climate change and climate justice are highlighted as key global issues requiring collective action. The article also emphasizes the potential of digital transformation and the importance of inclusive multilateralism and respectful international cooperation. Partnerships between states, public-private collaborations, and engagement with civil society organizations are seen as crucial for achieving the SDGs and addressing global challenges effectively. The article concludes by highlighting the opportunity for localized, long-term, and systemic development cooperation to shape a better future.

All these levers for transformative change are taken up by the authors, who recognize that technologies and digitalization are no longer all that fantastic and innovative, but the prevailing forms of linear, extraction-based economies enabling the digital devices to work have already induced unwanted environmental problems. At the same time, the various interconnections through powerful market trends seem to tick all the boxes in the definition of general requests and purposes of new (future) skills. This leads to the social and social-cultural side of the same coin: the new mechanisms of impeding or allowing inclusive societies. The current dynamics between skills, digitalization and inclusiveness force the authors of this book to ask the question: How can we privilege those who are creating value for societies while reducing natural resource consumption through enabling re-use and share of materials? What are the role models and narratives going forward?

–Nicolas J.A. BUCHOUD, Gunnar HARTMANN, Holger KUHLE, eds.

“City-led initiatives must be embedded into a transition of city services, infrastructure, and business innovations, and must jointly leverage the different tools cities have at their disposal.”

—Magash NAIDOO, Marion GUÉNARD

Quote from the article “Circular Transitions from the Consumption Side: Influencing Lifestyles at City Level” in Intersecting Vol. 9 by Magash Naidoo and Marion Guénard (International Council for Local Environmental Initiatives ICLEI, Germany). Image Source: In the outskirts of Indonesia’s capital Jakarta, construction of the new MRT network is accelerating after years of stalemate (shown here with business districts in the background and agricultural land and water systems in the foreground). 2022. Image by Nicolas J.A. Buchoud, all rights reserved ©.

# inclusion
# skills
# digitalization

**1.1. Social Inclusion in Cities 3.0**
Michael COHEN, Director, Doctoral Program in Public and Urban Policy, The New School, New York, United States of America

**1.2. “There is no trust in anyone” – On the Fatal Artlessness of the Crisis**
Rainer KERN, Founder and Artistic Director, Enjoy Jazz Festival; Special Advisor to the Mayor, City of Mannheim; Independent Consultant - policy, culture & arts, sustainability, networks; Chairman, UNESCO Cities of Music Network (until September 2023), Heidelberg, Germany

**1.3. Annihilating Space and Time**
Mathias JANKE, Technical Advisor Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Frankfurt, Germany

“As digitalization creates job opportunities, higher income and secure employment for some, it exacerbates inequalities and exploitation for many others.”

—Sandra FLICKE-LOETZSCH, Fabiola FRICK

Quote from the article “Talent Is Evenly Distributed, But Opportunities Are Not – Impact Sourcing as an Enabler for Tomorrow’s Digital Creatives in the Global South” in Intersecting Vol. 10 by Sandra Flicke-Lötzsch and Fabiola Frick (Deutsche Gesellschaft für Internationale Zusammenarbeit GIZ, Germany). Image Source: Rickshaw drivers transporting passengers and goods in Sonipat, near New Delhi, India, in December 2022. Image by Nicolas J.A. Buchoud, all rights reserved ©.

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## Social Inclusion in Cities 3.0

The essays included in this volume demonstrate that the debates about the role of cities in the global economy have moved on. We are not only far beyond the discussions of globalization of the 1990s, but we have also moved past earlier thinking about value chains, digitalization, and the new kinds of economic impacts which became visible during the Covid-19 pandemic. The world is in a different place, and so must be our thinking. As we enter new debates, I believe that we should urgently increase the intensity of our focus on social inclusion.

Two recent narratives about the current historical moment set the context. First, a 2022 report by the UN Economic Commission for Latin America has concluded that "globalization is over" and has been replaced by divergent patterns of regional productivity and growth.[1] Growth and trade are less and less about global markets, and are increasingly devoted to specific geographies and sites of production. Terms such as "near-shoring" or "friend-shoring" suggest that proximity of production has become more important.

A second converging narrative by Shannon K. O'Neill demonstrates that global economic growth has been closely tied to regional capacities and opportunities all along.[2] The global is composed of regional units. O'Neill argues that country growth has benefitted from an emphasis on trade within regions. She notes that China in 2022 accounted for about 50% of all production, while Europe and North America contributed another 40%, and the remaining 10% came from Africa, Latin America, and the Middle East. Most trade is within Asia, between Asian countries and markets. The same applies to Europe and North America.

This trend highlights how regional, national, and local conditions will affect production, trade, and consumption, but also spatial equity and social inclusion. As we plan and set policies for "Cities 3.0," I would suggest that we must learn from the pandemic period that inequality and social exclusion grow rapidly during periods of change. The rich do well; the poor face new forms of deprivation and obstacles to social mobility. As Oxfam has reminded us, Covid-19 was also the "inequality virus." [3]

Another lesson from recent history is that contextual features heavily affect social inclusion. Global thinkers rarely devote sufficient attention to local contexts. I would suggest that we

need to pay attention to what might be called the "7 Cs."

These include:

1. Consistency: We need to assure that countries' macro and micro-economic policies are not working at cross purposes with sectoral strategies. This requires more government coordination, not less.

2. Composition: The composition of contextual factors necessarily varies from country to country. Our approaches must reflect that individuality as well as a diversity of local knowledges.

3. Conditionality: Conditionality must vary from country to country and city to city, reflecting actual conditions on the ground and existing institutional constraints.

4. Cascading Crises: We must recognize that crises affect each other and often have multipliers which can deepen specific local impacts.

5. Causation: Causation is cumulative, with one action generating consequences which build on one another. Together, over time, these consequences create structural inequalities.

6. Cities: Cities are the locus for this complicated patchwork of cause and effect, of policies and impacts. Cities are also spaces of hope for social and economic progress, but they must assure social inclusion. If the ILO is correct that 90 % of employment in developing countries is informal, then we must change our view that formal work is superior to informal work. Indeed, formal employment is a small minority of total employment.[4]

7. Communication: A key to effective action is communication, between public authorities and their constituencies, and between public and private actors. Current forms of communication fail to reach the full diversity of local communities.

These requisites are only briefly identified here, but they are essential factors to keep in mind.

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2. Shannon O'Neil, The Globalization Myth: Why Regions Matter (New Haven and London: Yale University Press, 2022)

3. OXFAM-India, Davos-India Supplement, The Inequality Virus (2021)

4. International Labor Organization, Patterns of Informal Employment (Geneva: ILO, 2018)


"The availability of smaller and cheaper digitalized tools has the potential to help craftspeople to move out of low-volume, hand-made crafts, while preserving the originality of their cultural designs."

—Marisa HENDERSON, Hubert ESCAITH

Quote from the article "Handicrafts and the Creative Industry 4.0" in Intersecting Vol. 10 by Marisa Henderson (Creative Economy Section United Nations Conference on Trade and Development UNCTAD, Switzerland) and Hubert Escaith (The World Trade Organization WTO, Switzerland). Image Source: A mural QR-Code from the '10,000 Moving Cities-Same but Different' by the Swiss media artist Marc Lee in the Lodhi Colony Creative District area in New-Delhi, an Initiative by India St+Art Foundation, 2019. Image by Nicolas J.A. Buchoud, all rights reserved ©.

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## “There is no trust in anyone” – On the Fatal Artlessness of the Crisis

A famous dictum by Albert Einstein is: “Problems can never be solved with the same way of thinking that created them.” Einstein used the plural, “problems.” And this plural has become our biggest problem. We live in a time of multi-crisis. The resulting maximum complexity of global crises and developments is considerably intensified by the fact that there is hardly any leeway with regard to a possible prioritization and successive processing of problem areas. Sustainable approaches to solutions within the resulting complex situation must necessarily take place simultaneously and be interlinked. Perhaps this is even the decisive and still often underestimated paradigm shift: The belief in progress, programmed into us in evolutionary terms, has led us to fundamentally value time as a criterion that works for us. Almost all development strategies – whether technological, economic, medical or humanitarian – have traditionally been based on this. For too long, we have acted as if time working for us would also solve the problem of time working against us. Now, we are faced with the ruins of this erroneous belief – and we see before us, with unprecedented clarity, what it entails: the dismantling of democracy, climate change and famine, climate-induced migration and much more.

What role do art and culture actually play in this multi-crisis context? Now it becomes paradoxical: a subordinate one. In times of great complexity, of all things, we are foregoing the inclusion of a system of order that is essentially based on discourse and inspiration. In fifteen out of sixteen German federal states, for example, culture is only considered a “voluntary service.” This is linked to the legally stipulated obligation to first cut back or discontinue funding for such voluntary services in times of crisis, i.e., especially for art and culture. In the pandemic situation of recent years, it has also become clear that art is the first to disappear, with consequences that often threaten the existence of artists. This is against our own interests. For how else could one explain the fact that art is the first to be summoned after a crisis in order to rebuild society and is itself reinstalled faster than other areas? When industry was still in ruins after the Second World War, the theatres were already performing again. When the process of coming to terms with the civil war-like conflicts in Peru, which dragged on into the 2000s, seemed to be hopelessly stalled, it was, according to the assessment of those politically active at the time, essentially art and culture that were able to get the dialogue

that was indispensable for national reconciliation going again. That, too, is just one example of many.

Why, then, is art not, or far too rarely, included as a constant in social, economic and political considerations in accordance with its significance and value? On the one hand because, especially in Western democracies, the understanding of art is often stuck in pre-democratic times. It is an ornamental accessory, serving as edification and as measurable proof of the system's sophistication. Its impulses and creative power are usually seen and accepted, but not or only rarely really used in the sense of transfer. On the other hand, presumably because art has an often astonishing individual resilience, but not sufficient systemic resilience.

One could even go so far as to state that dictatorial regimes apparently value the influence of art and culture more highly than is the case in democratically constituted systems. They consider art and culture to be such powerful instruments of free will, discourse and transformation that they want to prevent them at all costs. Under the Taliban regime, the Afghan Ministry of Education had banned girls older than twelve from singing. After protests at home and abroad, it was officially withdrawn for image reasons, but the principle remained: Music and art in general are undesirable and de facto forbidden. The mere possession of an instrument can result in arbitrary draconian punishments. Incidentally, the quote in the headline of this text is from a 23-year-old Afghan musician named Yama Ahadi. He was persecuted in his home country for practicing his art and was eventually able to be brought out of the country by "Mission Lifeline," one of only two musicians to do so. The second had previously been tortured by the regime. Rescuing artists is not a priority.

What makes art so powerful from the point of view of its opponents is its visionary power, its ability to generate imagination and the will to participate and to artistically act out even the most complex processes, to make them comprehensible and thus visible and perceptible as constructively changeable. By its very nature, art always has something to do with transformation. Nowhere is the will and readiness for change better trained than in art. In times of equally urgent and highly complex socio-political, economic and ecological change processes, it is therefore a fatal omission not to lead them in an integrative manner. Mondiacult 2022 in Mexico City, the world's largest intergovernmental cultural conference of the last 40 years with 150 countries participating at the invitation of UNESCO, put it in a nutshell: For the first time, culture was defined as the fourth pillar of sustainable development between states and at the same time recognized as a global public good. Culture is thus recognized as an important driver of overall development. This is spectacular in the sense of the overdue writing down of a long-standing insight. However, it will only be as good and helpful as the commitment and consistency of those who translate this political will into concrete action on the ground, i.e., in cities and countries. And as with the

implementation of the 2030 Agenda, this can only happen successfully if cities (can) take on an active role. For this, resources need to be made available, therefore the financial distribution between nation states and cities needs to be renegotiated, and ultimately the globally valid multilateral system of governance needs to be extended to cities on an equal footing. But that is another matter, albeit equally urgent.

At Harvard University, Prof. Doris Sommer founded an initiative (NGO) that runs an art-based literacy program called “Pre-Texts” in schools in Latin America and Africa, among other places, which promotes writing skills, critical thinking, and civic awareness. As part of this initiative, Sommer has put together a panel of international experts from the fields of political consulting, science, art and culture and launched another program called “Renaissance Now.” It is aimed at senior management in city administrations and the economy. It shows ways and imparts implementation skills in order to use participatory arts to create new resources for solving pressing social problems on the ground.

Behind this is the realization that art is predestined to play a central role in the development and implementation of abundant resources for constructive, proactive and solution-oriented action. It is not only an important promoter of our inner balance and mental health. It is also penetrating ever deeper into academic knowledge processes. For art and culture are not only critical and empathic companions of change processes, they have the potential to act as game-changers. It is up to us to acknowledge this potential and finally use it consistently. For that means scattering Einstein’s insight from the beginning of this text and turning it into action, making new use of a well-known and hardly exploited resource.


“The adoption of new circular practices does not only depend on market conditions, but also on social, cultural and cognitive factors.”

—Hilde REMØY, Alex WANDL

Quote from the article “Challenges for Circular Urban Development” in Intersecting Vol. 9 by Hilde Remøy and Alex Wandl (TU Delft, Environmental Technology and Design, Netherlands). Image Source: A look at the conference area of the World Urban Forum 11 in Katowice, Poland, which raises the question of the physical form of knowledge building and sharing, as well as policy making through large assemblies, e.g. on urbanization, climate, biodiversity, etc. 2022. Image by Nicolas J.A. Buchoud, all rights reserved ©.

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## Annihilating Space and Time

In 1843, the German author Heinrich Heine was astonished by the unfolding age of trains. Living in exile, he wrote that at the local train station in Paris he could already smell the German sea and German lime trees: "The railroad annihilates space and only time remains." [1] As magnificent as this may sound, it is equally impossible. Naturally – and thankfully – one cannot annihilate either space or time. What really happened: The relation of space to time (of kilometers per hour) had accelerated drastically. Speed was increasing, and it has ever since.

From an economic perspective, human consumption is divided into two categories: goods and services. Goods are basically material things that our body either directly ingests or which surround and indirectly comfort it. Services, on the other hand, mostly rely on immaterial information. For a long time, immaterial information moved with the same speed as material: The post was only as fast as the fastest runner, rider, dove, train or plane. In case of Heinrich Heine's mid-nineteenth century train, that was around 60 km/h. However, when telegraphy, telephony, radio, and television were invented, information went supersonic: Seemingly decoupled from its material base, information started to travel close to the speed of light at easily more than one billion km/h.

Nothing is faster than light. So how did and does digitalization add to this race of information? Well, computers are faster than humans. Based on algorithms, the circuits of a computer can produce out of incoming signals new outgoing signals. These tasks take them a fraction of a second where humans would have needed hours, days, or even longer. Moreover, computers can run calculations that humans would never have been capable of performing. Since "Deep Blue" won against world champion Garri Kasparov in 1996, humans have lost against top chess computers – always. Humans, being more and more the slowest link in the information processing chain, are consequently replaced. One of the most staggering examples is probably the financial system: In the twentieth century, a limited number of financial traders gathered around order books – for a long time in the form of chalkboards. On trading floors, they shouted at each other and into their telephones. Today, the order books are in server parks where most trading operations are handled by algorithms; the material trading floors are now deserted spaces which have fallen silent.

In the same manner, computers' ability to run algorithms

also allowed the creation of virtual spaces for other kinds of human interaction. While a telephone call is an exchange of information between two human beings, internet platforms allow the exchange of information between millions – without any of them having to move. These days, whoever possesses a smartphone has more information within reach than any scholar in any library in the twentieth century. Thanks to digitalization, information can be easily and immediately consumed and shared among humans by text, audio, graphically, or all of these at once by video.

In the economy, digitalization (together with other aspects of automatization) is accelerating production. Processes are running faster and more efficiently: Costs are reduced, competitiveness thus increases, and profits potentially increase too. More and more products are produced within the same amount of time. Speed is further increasing, and production is skyrocketing. At the same time, replacing humans has and most likely will further shift jobs from agriculture and industry towards services. No wonder: In the latter sector, the human domains of complex information processing and especially creativity are particularly present. However, the emergence of increasingly capable AI, for instance in translation, also replaces tasks in this field. Taken together, by increasing the amount of information and its speed, digitalization is driving productivity, and new jobs are evolving while others become obsolete.

In 1930, in the middle of the great depression, the founding father of macroeconomics, John Maynard Keynes, described the phenomenon of "technological unemployment." He argued that a hundred years later – so roughly about now – technology and the principle of capital accumulation would have raised productivity substantially. Thus, such wealth would have been created that "for the first time since his creation man will be faced with his real, his permanent problem – how to use his freedom from pressing economic cares, how to occupy the leisure, which science and compound interest will have won for him, to live wisely and agreeably and well." [2]

Keynes was right about productivity and capital accumulation. Worldwide, capital has increased about eightfold since 1960,[3] and world GDP per capita has increased more than threefold alone since 1993.[4] Yet, Keynes was wrong about leisure: Although worldwide production would be sufficient to enable a worldwide decent life with long periods of leisure, the world is speeding on, accelerating further, exploiting its natural resources with increasing intensity – despite all political pronouncements on sustainability. It seems the world is still racing, although it reached the finish line long ago.

What happened? What went wrong? To be fair, Keynes only wrote about "progressive countries." However, in these developed countries, for most people, no age of leisure has dawned in the last 100 years – not to mention developing countries. Although worldwide poverty significantly

decreased since the turn of the millennium, close to 50% of the world population still lives on less than 6.85 USD (at 2017 international prices) per day – which is far away from a life in wealth and leisure.[5]

In the same article, Keynes wrote that some human needs "which satisfy the desire for superiority, may indeed be insatiable; for the higher the general level, the higher still are they." Our economy is a race. It is based upon competition – and if some powerful competitors one day decide to take it easy, they may find themselves out of business, because there is no way the others would stop. A lot has been written and said about Schumpeter's creative destruction, yet most global "disruptive" innovations come from the same societies of the Global North. Do they disrupt the distribution of wealth? Not really. Drop the old stock, buy the new one. And what people particularly tend to forget: In a race without end, there is also no fair restart. Although there is the narrative that the Global South may catch up, the opposite is the case: Productivity of an average citizen in the Global North is growing faster than that of an average citizen in the Global South.[6]

Digitalization has accelerated the race that is our economy to unknown speed. According to Heinrich Heine, digitalization metaphorically annihilates space. Indeed, our planet seems to have grown smaller. Heine also wrote that only time remains – so Keynes had hoped, but no era of leisure has dawned. Whoever wants to eat and own, needs to work and join a race beyond the finish line. We are annihilating space and time.

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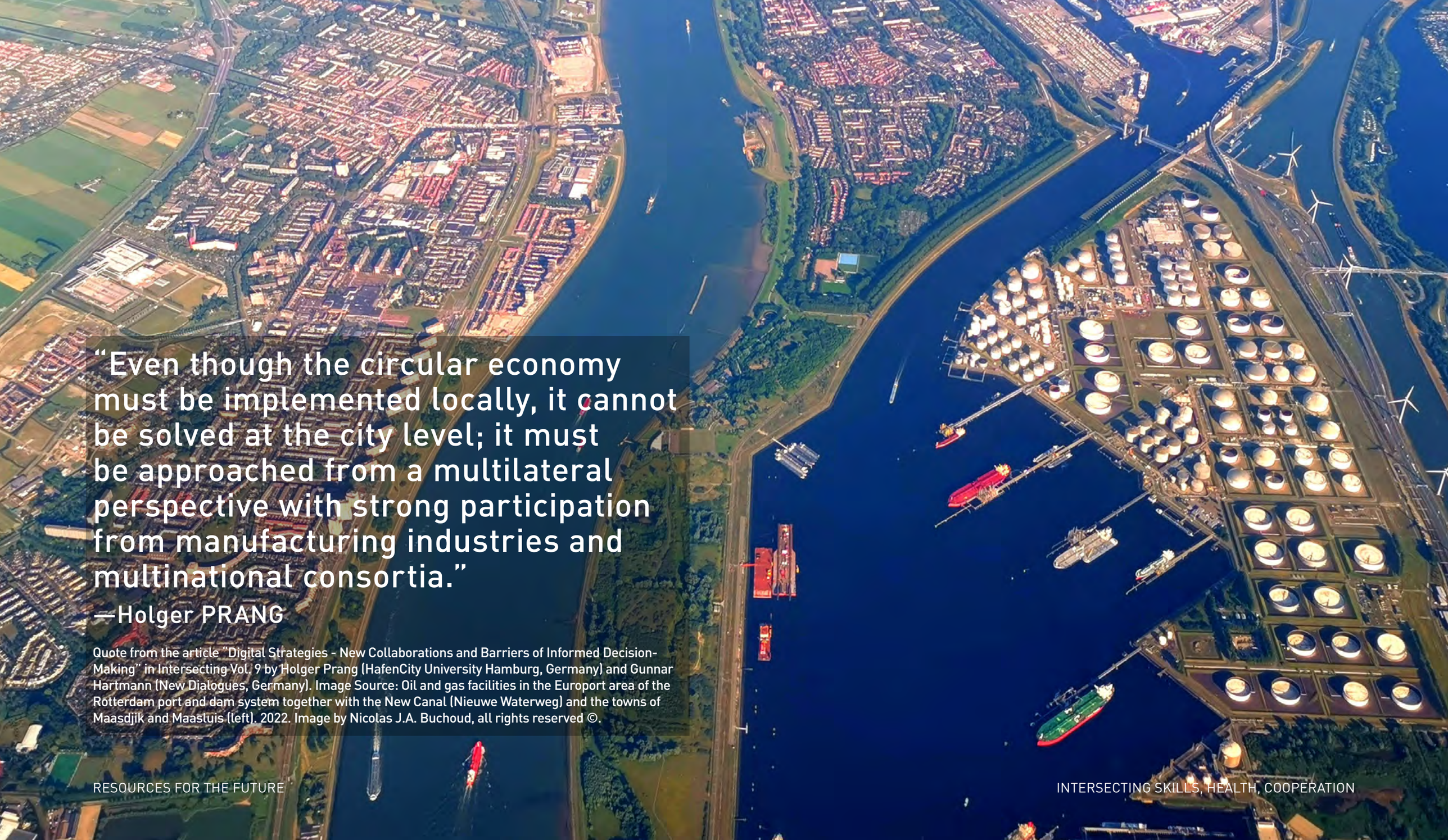

“Even though the circular economy must be implemented locally, it cannot be solved at the city level; it must be approached from a multilateral perspective with strong participation from manufacturing industries and multinational consortia.”

—Holger PRANG

Quote from the article “Digital Strategies - New Collaborations and Barriers of Informed Decision-Making” in Intersecting Vol. 9 by Holger Prang (HafenCity University Hamburg, Germany) and Gunnar Hartmann (New Dialogues, Germany). Image Source: Oil and gas facilities in the Europort area of the Rotterdam port and dam system together with the New Canal (Nieuwe Waterweg) and the towns of Maasdjik and Maasluis (left). 2022. Image by Nicolas J.A. Buchoud, all rights reserved ©.

**2.1. The Ins and Outs of Urbanization**
Lars LERUP, Designer and Writer, Professor Emeritus, University of California at Berkeley, Dean Emeritus, Rice School of Architecture, Houston, United States of America and Gunnar HARTMANN, Publisher, Editor, and Architect, New Dialogues, Berlin, Germany

**2.2. Framing the Policy Debates on the Future of Work**
Ramiro ALBRIEU, Principal Researcher, South American Network of Applied Economics, RED SUR, Buenos Aires, Argentina

**2.3. A Health Impact Fund**
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# urbanization
# work
# health

“Many medium-sized cities in the Global South face a systematic problem with data collection due to inadequate data infrastructure. One priority would be to address the imbalances created by the fact that urban science is essentially developed in the Global North.”

—Esteban MUNOZ, Sharon GIL

Quote from the article “Accelerating the Transition to a Circular Economy Through the Creation of Local Jobs” in Intersecting Vol. 9 by Esteban Munoz and Sharon Gil (The United Nations Environment Programme UNEP, Cities Unit, France). Image Source: In Nairobi, the capital of Kenya, where the last decade has seen a dramatic increase in the construction of new roads to cope with rising traffic volumes, people still largely have to make their daily journeys on foot. 2018. Image by Nicolas J.A. Buchoud, all rights reserved ©.

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## The Ins and Outs of Urbanization

**Gunnar HARTMANN (GH)**: "Almost all growth of the human population this century will be accounted for by a growing number of city dwellers." [1] Clear, unquestionable, based on statistics – the statement nevertheless requires unpacking. Behind this apparent one-way move, hides a back-and-forth between what, in the past, we called rural and urban. A binary that has worn out its use, and should now be replaced by a process. The process of urbanization.

**Lars LERUP (LL)**: The statement suggests a distinct separation between a rural dweller and a city dweller – a miraculous overnight transformation. However, a newcomer to the heavily urbanized city struggles to make use of its abundance of resources, and it may take years to utilize these resources, if ever. It is therefore more correct to speak of an urbanizing dweller. For many of us, this is a lifelong process.

Old thoughts linger – at one end, we assume that a city contains a series of essential functions within walking distance (government, control, courts, and cultural venues). Here the city is seen as a central and discrete object. At the other end, the word "city" is freed from its object, operating in language, and available for a wide variety of assignations – legally, all types of urbanization inside the city limits are referred to as the city; however, my own personal view of a small portion is also seen as the "city." In the meantime, the (physical) citification is expanding to such a degree that the notion of a "discrete object" no longer holds – the figure has disappeared in favor of an assemblage. This fabric is made up of smaller assemblages, some of which are quite figurative – a single-family house, a car, a park, and so on.[2] The new city is a vast assemblage of such "machines" – each one actionable. The convenient distinction between urban and rural has collapsed. Since the center no longer holds, megashapes, such as a freeway system, become the navigation system. For drivers, the Geographical Position System replaces the physical form of the city. For passengers, individual cities become linear constructs, unfolding around each errand. The migrant worker walking in from Haiti to the developed Dominican Republic to work for the day is not just "the last

pedestrian," but also a city dweller experiencing the city in pedestrian detail.

**GH**: Another example that demonstrated the complex assemblages at work was the large movement of migrant workers in India who returned to their small towns and villages during the recent Covid pandemic. The pandemic revealed previously what had remained hidden. Migrant workers, the most recent city dwellers, remain connected to the less urbanized areas through family ties; in some cases, their children stay behind and are raised by the grandparents. Portions of the migrants' income flow back into their home areas. When they get sick or can no longer work (as during the pandemic), they are forced to move back home.

German sociology differentiates the greater process of urbanization in two distinct processes: citification (Verstädterung) and urbanization (Urbanisierung). Citification refers to the change of settlement structures and to demographic change. That is, citification describes a development in the course of which an ever-greater proportion of the population lives in cities, while the proportion of the rural population declines. This process thus writes a shift in population distribution and a change in settlement structure.[3] Urbanization stands for considerable cultural as well as lifestyle changes that lead to individualization and emancipation from strong ties to the community. In other words, one could adopt an urban lifestyle while living in the countryside. While citification is a quantitative term, urbanization is a qualitative term. For the possibility of data collection, the quantitative perspective receives the most attention and therefore seems to be the most discussed. Using the semantic distinction that you made earlier between city dweller and urbanizing dweller, could we then say that the city dweller is dependent on a city for physical access to labor markets and various services, and that the city of the city dweller represents a place for economic and cultural production? If so, what kind of resources are available for the urbanizing dweller?

**LL**: The key here is access. In a field of heavy urbanization, a high-income dweller has "total access." Meanwhile, a low-income dweller may have virtually zero access – both living in the same abundance. As a verb, urbanization is relative.

Citification implies that we are all city dwellers, but since access to a city's resources is relative, citification is a description of the infrastructure available – the availability of housing, the speed of the Internet, the variety of job opportunities and so on. Those who utilize these resources is another matter. The professional living on the top floor makes full use of the citification. The homeless person living in a tent on a sidewalk in Los Angeles, or a cleaner in a hotel in Delhi, living behind the garbage bin, live in the wake of citification, far away from its resources, in two of many urban lacunas. Dwelling in all its facets is always somewhat unhinged from the degree of urbanization. Deforestation in the Amazon is a

reflection of heavy urbanization, while its workers are mere cogs in the machinery. Their dwelling is probably worse than that of the forest population that they displace. Nothing new here.

The last pedestrian, whom we encountered above in the Dominican Republic, is walking daily back and forth between two levels of urbanization. They are slowly transferring wealth gained through labor in one location to another, literally performing urbanization. What is being performed is not just the transfer of money, but skill, understanding and insight.

**GH**: We are in the habit of dividing things, e.g., between urban and rural, and once we have done so, we consequently view them as distinct. The late Hans Rosling pointed out that our general "gap instinct" is firmly established. He objects to what he calls the "mega misconception" that the world is divided into developing and developed ends. Instead, he suggests looking at the developing world through the lens of four income levels. What I'd like to suggest is that we turn Rosling's four levels (see Gapminder's Life On The Four Income Levels) [4] into a tool for allowing us to capture the phenomenon of urbanization beyond worn binaries.[5]

**LL**: The Swiss astronomer Fritz Zwicky, in his work on rocket systems, effectively used a morphological box as a design tool during the Second World War. Rosling's box, defining life under four income levels, is a heuristic one; rules of thumb that can be greatly expanded in depth and breadth. Looking at drinking water, the sudden rage for bottled water on Level 4 brings us back to Level 1, if the water is not delivered but picked up. The use of images and accompanying annotations show how versatile morphological thinking is. A plastic bucket used to fetch water on Level 1 shows how a sophisticated machine product trickled down the urbanization ladder to its last rung. In turn, this shows how some form of urbanization is now global. But also, that a distinct assemblage of resources is necessary to claim citification. One bucket does not make a city. We see Gapminder's "Life on the Four Income Levels" heuristic box as a working tool, but also as a gathering point for an integrative conversation; here, each profession, each interest can find a window, a way to join the conversation.

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“Following the syntrophic principle from nature, waste or energy from a city can ideally provide resource input for agriculture in surrounding rural areas where food for the city is produced.”

—Andreea OARGA-MULEC, Petter D. JENSSEN, Vesna LAVTIZAR

Quote from the article “Urban Biocycles – Connecting Built and Natural Environments with People” in Intersecting Vol. 9 by Andreea Oarga-Mulec (University of Nova Gorica, Slovenia), Peter D. Jenssen (Norwegian University of Life Sciences, Norway), Vesna Lavtizar (Institute for Global Environmental Strategies IGES, Japan). Image Source: Wikimedia Commons. March 26, 2015. Riga fertilizer terminal (Latvia). Photo Credit: Karlis Dambrans. https://commons.wikimedia.org/wiki/File:Riga_ fertilizer_terminal.jpg

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## Framing the Policy Debates on the Future of Work

As a pleasure or as a burden, "work" has always been a central coordination device between humans, assigning different roles and identities to the members of a community and in this way creating an organic whole based on diverse parts endowed with a certain autonomy. Since we began to work, there have been machines or artefacts around us: Man-made arrangements of elements of the environment that help us to fulfil our roles. It is impossible to deny the role of technological innovations on growth and well-being. In the first industrial revolution back in the eighteenth century, the United Kingdom and some regions of continental Europe were leading technological innovations around steam power, and outstripped the rest of the world. The second industrial revolution at the turn of the nineteenth century saw the emergence of the United States and the proliferation of electricity-powered mass production systems. In the 1990s, the Information and Communication Technologies (ICTs) revolution fueled a series of Asian miracles that put China above the US in terms of GDP, expressed in international (PPP) dollars.

Many of these very disruptive innovations (which economists called "General Purpose Technology," or GPT) redefined the world of work. The Neolithic revolution transformed hunter-gatherers into farmers; the Industrial revolution converted the self-employed into factory workers.[1] For the subset of GPTs that emerged in the last 200 years, new labor relations came with the movement of workers from low-productivity jobs to high-productivity jobs, resulting in higher economic growth and unprecedented improvements in living standards. Countries that escaped low-growth and development traps have created new, better paid jobs by leveraging the advantages of emerging technologies in past industrial revolutions.[2] They managed to develop, adopt and adapt new technological solutions quickly and widely enough to transform them into relative gains in terms of productivity and living standards.[3]

In the current context of a new wave of technological innovation, with artificial intelligence at the center of transformative change, societies are reorienting their efforts to make the most of the new GPT. As firms are reimagining products and processes and workers are increasingly intertwined with digital tools, the world of work is again entering a redefinition process.[4] Governments are aware of these mutations, and policy frameworks regarding current and future labor markets – that cover a variety of issues,

ranging from skills to technology and regulation – are being revised to shape the trajectory of change toward a future with higher productivity and better jobs for all.[5]

There is no straightforward way to build these frameworks. Why? Because technological change is a systemic change, where diverse issues such as infrastructure, skills, demographics, and international cooperation must be taken into account. We list three significant trends: technology, the climate and demographics. We refer, of course, to artificial intelligence as already mentioned, to global warming, and to the demographic transition. We need to be able to go beyond analyzing each one of these trends in isolation, and integrate them into a unified framework. The impact of these trends on the future of work is not known in advance, but depends critically on the set of behaviors of governments, firms, and households – what we call "the response." The rapid speed of change and the consequent break with the past indicate that status quo institutions (which explain the current set of learning systems, social protection policies and incentives to innovation) are hardly up to the challenge. This is a complex matter; innovation is badly needed in public policy in diverse areas such as education, the labor market, and science and technology.

Things get more complicated. Economic and social transformation is deeply rooted in the local context. Even in the case of digitalization, which pretty much has to do with moving economic and social activities from a world made of atoms to a world made of bits, both the rate and the direction of change are conditioned by the capabilities of local firms, the stock of skills of domestic workers, the available national infrastructure, the state of government finances, etc.

The Global South differs fundamentally from the Global North in this respect. Take, for example, the discussions on technological change. Global North debates on technology and the future of work are built on the premise that AI-centered technological innovation is booming, and its growth is exponential.[6] The future is already here. In a context where the conceptual field is dominated by science fiction,[7] the Global North's narrative on the future of work represents a good first step for guiding public frameworks, as it breaks away from the – largely unfounded – fears of robots dominating humans. However, this narrative has its own set of assumptions regarding the pattern of technological change, the functioning of institutions, and, more generally, everything that matters for the future of work.

How can we enrich debates to reflect the challenges and opportunities of the Global South? We have identified four key structural features where the Global South and the Global North differ, and which need to be emphasized in any meaningful narrative about the future of work in the developing world. First, in the past, the Global South has failed to make the most of global technological innovations, and remains a follower in the age of AI.[8] This matters

because governments in the Global South cannot take exponential innovation for granted. Of course, developing countries need to understand the consequences of fast automation. However, at this point, automation is probably not as much of a threat as failing to encourage a more accelerated diffusion of new technologies. Second, the challenges of skilling and reskilling are more complex in the Global South,[9] as many current and future workers are excluded from education and training institutions. Furthermore, those who are integrated in these institutions suffer the consequences of low-quality education systems and learn the hard way that that schooling is not the same as learning.[10] From a Global South perspective, curricula reform must be addressed, but new elements of analysis – low coverage, bad quality, scarce finance – also need to enter into the picture. Third, labor market institutions differ in fundamental ways. While technological change is challenging formal jobs in the developed world, in the less developed we need to add to these threats the likely impacts in the informal sector, as non-standard forms of employment are the norm.[11] Fourth, inequality in the Global South goes well beyond income. In these countries, the uneven distribution of voice, digital capital, skills, and firms' capabilities translates into a marked inability to take advantage of emerging growth opportunities, such as technological innovations. Getting into the complex issues related to structural inequality is key for countries in the Global South.

Reframing the policy debates on the future of work to embrace systemic and locally rooted perspectives is a critical step toward creating better jobs in the future. Let's hope we are up to the challenge.

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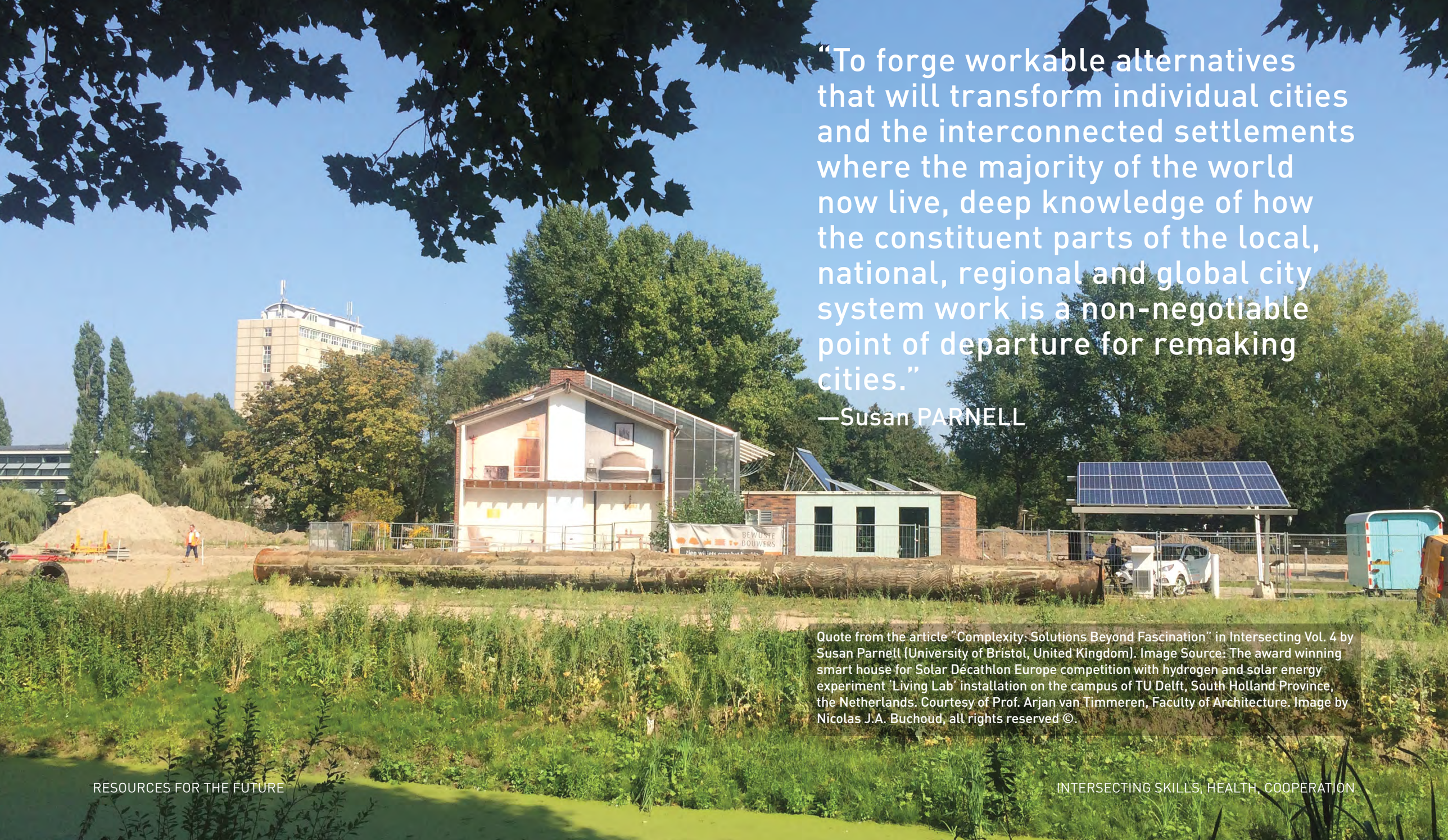


"To forge workable alternatives that will transform individual cities and the interconnected settlements where the majority of the world now live, deep knowledge of how the constituent parts of the local, national, regional and global city system work is a non-negotiable point of departure for remaking cities."

—Susan PARNELL

Quote from the article "Complexity: Solutions Beyond Fascination" in Intersecting Vol. 4 by Susan Parnell (University of Bristol, United Kingdom). Image Source: The award winning smart house for Solar Décathlon Europe competition with hydrogen and solar energy experiment 'Living Lab' installation on the campus of TU Delft, South Holland Province, the Netherlands. Courtesy of Prof. Arjan van Timmeren, Faculty of Architecture. Image by Nicolas J.A. Buchoud, all rights reserved ©.

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## A Health Impact Fund

Globalized in 1995 through the TRIPs Agreement,[1] humanity's dominant mechanism for encouraging innovations features 20-year product patents that reward innovators through monopoly markups. As the recent Covid-19 pandemic has shown once more, reliance on this mechanism is morally problematic in the pharmaceutical sector. It excludes the global poor who cannot buy patented treatments at monopoly prices and whose specific health problems are therefore under-researched, and it discourages pharmaceutical firms from fighting diseases at the population level with the aim of slashing their incidence.

These problems can be alleviated by establishing an additional, optional reward mechanism that would enable pharmaceutical originators to swap their monopoly privileges on a patented product for impact rewards. Such an international Health Impact Fund (HIF)[2] would require prices of registered products to be delinked from R&D expenses and limited to the lowest feasible variable costs of manufacture and distribution. This price cap could be determined through a tender among competing contract manufacturers, or the innovator might issue royalty-free licenses for the manufacture and sale of its product.

In exchange, the HIF would make predictable annual distributions that are divided among registered products according to the health gains achieved with them in the preceding year. Each registered product would participate in ten consecutive annual payouts and then go generic. Some version of quality-adjusted life years (QALYs) could be used as a common metric for comparing and aggregating health impact across diverse diseases, therapies, demographic groups, lifestyles, and cultures.

The HIF would create a novel market in which new pharmaceuticals of all kinds could compete in the quest to achieve the most cost-effective health gains. Over time, a stable, self-adjusting reward rate ($/QALY) would emerge. When innovators find it unattractive, registrations dry up and the reward rate rises as older innovations exit at the end of their reward period. When the reward rate is seen as generous, registrations multiply, and the reward rate declines. Such equilibration reassures participating innovators and contributors that the reward rate will be fair and stable. Innovators would find HIF registration especially attractive for new pharmaceuticals with which they expect to be able to generate large cost-effective health gains but only

modest monopoly rents: effective remedies against diseases that are widespread, grave, infectious, and concentrated among poor people. Many HIF-registered pharmaceuticals would be ones that otherwise would not have been developed at all.

Each year, millions suffer and die from diseases that we could treat or prevent with medicines that could be mass-produced quite cheaply. The HIF would end this outrage by creating powerful new incentives to rapidly develop remedies against diseases that are concentrated among the poor, to provide such remedies with ample care at very low prices, and to deploy them strategically to contain, suppress, and ideally to eradicate the target disease. Registrants would gladly share their relevant technology and know-how to this end, and even invest in subsidizing their product to resource-constrained buyers and in promoting optimal use, if and insofar as the increase in impact rewards gained from wider and better use is expected to exceed the cost of the relevant investments.

To leave no one behind, the HIF assigns more value to the lives and health of poor people than what they themselves can afford to pay. Doing so is morally imperative. It is also collectively beneficial, especially with communicable diseases, which would be central to the HIF. By suppressing and ideally eradicating such a disease among the poor, all are safer from the threat it poses, including the threat of new drug-resistant strains, which often emerge in patients who cannot afford to take an expensive drug at full dosage for the full course of treatment.

The HIF would motivate registrants to build, in collaboration with national health systems, international agencies and NGOs, a strong public health strategy around their product. It would do so by taking full account of the health externalities of product deployments: rewarding not merely health gains achieved for treated patients but also realized reductions in the incidence of the target disease. The latter rewards are especially sweet because such health gains are generally highly cost-effective. For example, by making its product accessible rapidly, competently, and universally in one country, an originator may help contain a disease that would otherwise have spread into neighboring countries, thereby achieving health impact in those other countries without having to do any work there at all. Were its all-out effort successful in containing the target disease, this originator would, without further labor, collect health impact rewards from a grateful world.

Monopoly rewards, by contrast, penalize originator efforts at disease curtailment and eradication: as the target disease disappears, so does the market for its remedy. The HIF is useful, then, to motivate originators to fight communicable diseases at the population level. The absence of such incentives heretofore may well be the reason why, with all our scientific sophistication, and all the trillions spent on pharmaceuticals, humanity has only ever managed to

eradicate one single human disease: smallpox, over 40 years ago.

The HIF needs reliable, long-term funding commitments which, at least initially, must come from states. Their contributions would be offset by savings on registered pharmaceuticals and other health care costs (health insurance, national health systems, foreign aid) as well as by health-related gains in economic productivity and associated tax revenues. In addition, the HIF would greatly reduce wasteful originator spending on multiple staggered patenting in many jurisdictions with associated gaming efforts (e.g., evergreening), searching and preventing patent infringements, and mutually-offsetting competitive promotion efforts. Finally, the HIF would also avoid economic deadweight losses, corrupt marketing practices, and counterfeiting: With the genuine quality product widely available at a rock-bottom price, it is not profitable to market fake copies; nor is it necessary to patent the product in all jurisdictions when the HIF recognizes one reputable patent as sufficient for registration.

Contributions to the HIF might be based on Gross National Income, exempting lower-income countries. Should some affluent states decline to contribute, originators should be free to exercise their patent privileges in those states. This exception would give affluent countries an incentive to join. It would also lower innovators' opportunity cost of registration and thereby depress the HIF's endogenous reward rate, making it cheaper to attract a given number of registrations. In this way, the missing payments from non-contributing affluent states would be largely offset by the HIF's lower cost – making it realistically possible for the HIF to be launched by a few major countries.

Creation of the HIF is an extremely cost-effective reform, potentially freeing millions of mostly poor people from their debilitating ailments and greatly strengthening humanity's preparedness against communicable diseases.

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“Part of how we know the world in global health is shaped by ‘indicatorization’. Just as structural adjustment enables governance at a distance, global health is increasingly monitored through algorithms and statistical and mathematical modelling.”

—Alicia YAMIN

Quote from the article “From Health to Political Economy: ‘How We Know What We Know and Why Intersecting Matters Now” in Intersecting Vol. 1 by Alicia Yamin (Petrie-Flom Center for Health Law Policy, Biotechnology and Bioethics at Harvard Law School, Boston, United States of America). Image Source: Wikimedia Commons. About 100 people queuing at a supermarket in Italy during coronavirus outbreak. March 19, 2020. Image by Ian-Art. photography. https://de.m.wikipedia.org/wiki/Datei:Ian_Art_Photography_-_Italy_100_people_queuing_at_a_supermarket_during_coronavirus_outbreak_mar-2020.jpg

# technology
# infrastructure
# cooperation

**3.1. Intersecting Technology, Circularity and the Economy**
Shuva RAHA, Head - New Initiatives, Council on Energy, Environment and Water, New Delhi, India

**3.2. Achieving Circularity: Policy Instruments and Regulatory Hurdles**
Martin PAULI, Director, Global Leader Circular Economy Services at Arup, Berlin, Germany and Gunnar HARTMANN, Publisher, Editor, and Architect, New Dialogues, Berlin, Germany

**3.3. The Impossible Infrastructure Consensus?**
Nicolas J.A. BUCHOUD, President, Grand Paris Alliance Fellow, Global Solutions Initiative, Co-chair, T20 India TF3 Advisor to the dean of the Asian Development Bank Institute (ADBI), Paris, France

**3.4. Cooperation Remains Indispensable for Tackling Global Challenges**
Johannes KUMMEROW, Moritz HUNGER, and Jörn GEISSELMANN , GIZ Foresight Unit
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"If the materials that are being reused through the circular economy do not necessarily help mitigate broader relations of inequity among communities, should these processes still be categorized as being constitutive of the circular economy?"

—Gökçe GÜNEL

Quote from the article "On Status Quo Utopia, Technocratic Dictatorship, and Constitutive Processes of the Circular Economy" in Intersecting Vol. 9 by Gökçe Günel (Rice University, United States of America) and Gunnar Hartmann (New Dialogues, Germany). Image Source: The development of Riyadh, the capital of the Kingdom of Saudi Arabia, now includes major investments in public transportation to offset a car-oriented, resource-consumption-intensive (including land) growth model. 2020. Image by Nicolas J.A. Buchoud, all rights reserved ©

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## Intersecting Technology, Circularity and the Economy

The circular economy can equally enrich micro, hyperlocal processes in small communities and vast, interlocked global value chains spanning many products and places. Improvements can vary from small tweaks to simplify the distribution or collection systems of local handlers to save time and effort, to major design and engineering alterations that yield substantial resource efficiencies and investment gains.

The value proposition is the opportunity to use the intersections of resources, products, processes, people, and places to integrate circularity into value chains. The circular economy was once approached procedurally, to minimize and manage the end-of-life waste of the linear economy. Efforts were aimed at recycling or repurposing materials, components, and products to keep them in circulation, thereby maximizing resource gains. The idea is better understood now, and encompasses the design, engineering, production, transportation, distribution, use, and end-of-life management of each process and product in the value chain.

A value chain, irrespective of its length and complexity, needs to be deconstructed into logical and manageable segments to introduce circularity using a mix of policy, financing, capacity building, and technology levers. Successful integrations must also foster political will across local or international jurisdictions; alter existing markets or create new ones; adapt to local environments; leverage traditional expertise; and garner public acceptance. At the heart of successful circular economy revolutions is a creative blend of technologies: traditional and modern, analogue and digital.

Thoughtful product and process technologies help us select better resources, gathered via more sustainable extractive processes or recycled from other value chains, and use these with greater efficiency. Innovations like blockchain and the Internet of Things – online networks of physical objects connected by sensors and software – improve the tracking and management of resources and products, and production, transportation, use, and disposal systems. Real-time, continuous, and accurate metrics reduce data gaps and errors.

Technology can also improve people's involvement in, and experiences with, the circular economy. Automation reduces human effort and risk in unsafe, unhygienic or exhausting processes. E-learning systems deliver content, especially

audio and video in local languages, to homes and mobile phones, allowing people to learn and apply new skills, or hone existing ones. Digital inventories and payment systems can bring remote populations and the weaker sections of society into the mainstream, especially in emerging and developing economies. There is also a slow but steady rise in the consciousness of product developers to include local resources, traditions, experiences, and expertise to enhance the effectiveness of technologies in specific geographies, whether urban metropolises or small communities.

The emerging area of nature tech, which aims to sustainably deploy nature-based solutions at scale, and ecosystem-based approaches to protect communities and preserve landscapes and biodiversity from the adverse impacts of industrialization and climate change, could help bolster the circular economy. As Markus Lücke notes in his article, "On circularity and international cooperation," strategic decision-making must include monetary valuation of the environment and natural resources, and its inclusion in legal and administrative actions.[1]

New-gen technologies like virtual reality and artificial intelligence are compelling us to revisit our theories, policies, and practices, and helping us find better ways to sustainably grow our economies and improve our quality of life. Indeed, as Himkaar Singh asks in his "Case study of composting in South Africa," can we imagine how a society 500 years hence will manage waste?[2]



Will they use more and bigger trucks to transport waste to landfills and oceans in a dreadful escalation of our habits, or will they have a system to process their own waste, using technologies that minimize resource use and maximize ease of disposal and reuse?

The success of the circular economy also hinges upon the parallel development of supporting technologies like clean energy systems, resilient infrastructure, and sustainable transport. This needs a whole-of-government-and-economy effort, with all gears of the circular economy rotating in sync.

We must, however, guard against the overemphasis on technological interventions. We lead tech-intensive lives with a diverse, complex array of electrical, electronic, and digital appliances and devices. This ubiquitous envelope of technology, plus the outsized influence of technocratic policymakers and infotech celebrities flush with public funding and private investment, has created a skewed dependence on technology to solve virtually all problems.

This global subservience to "technocratic dictatorship," as noted by Gökçe Günel and Gunnar Hartmann in their article, "On status quo utopia, technocratic dictatorship, and constitutive processes of the circular economy," has seeped into the arenas of sustainable production and consumption, socioeconomic development, and climate action.[3]

Such techno-centrism banks on scientific problem-solving and process engineering to unravel the complex intersections of resources, people, the environment, and the economy. When applied indiscriminately in countries and communities, it excludes their varied priorities and stages of development, policy and regulatory landscapes, resource and finance availability, technological and human capacities, and the nuances of traditions and cultures.

Technology, deployed without adaptation to a specific purpose, place and people, will rarely, if ever, deliver to its full potential. The integration of technology in the circular economy must also be rooted in the ethos of Sustainable Development Goal 12, which endeavors to ensure sustainable consumption and production patterns. Design and technology choices that promote the planned obsolescence of products and materials by shortening their lifespans to drive replacement sales must be eschewed. This requires introspection into the profit-centric economic models and market mechanisms of the day. Another hazard of policy-technology entanglement is the techno-mercantilism of technology owning countries that devise policies to maximize exports and minimize imports. They strategically wield their technological prowess by leveraging intellectual property regimes, creating exclusive ecosystems and impeding the circular economy of global value chains.

International diplomacy and cooperation must actively discourage such siloes of supremacy, and promote technology co-development between developed, emerging, and developing economies. This way, all parties can adopt and adapt technologies as per their circumstances and capacities without compulsions, helping rebuild trust amidst fracturing multilateralism. Technology must enable us to creatively integrate best practices into the circular economy. Technology must equalize, with unbiased processes and platforms for all. And technology must empower us to maintain, and build upon, our cultural heritage and traditions, as we create a productive, inclusive and sustainable world for tomorrow, today.

This curation of INTERSECTING articles illustrates some pathways.

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"Circularity finally builds into the economy the nature of nature: a regenerative system. It makes recycling the very last logical option, it turns the term 'waste' into nonsense, because all remains 'resource'."

—Holger KUHLE

Quote from the article "Cities as Enablers for Circular Economy – Cities as Providers for Cooperation Across Businesses" in Intersecting Vol. 9 by Holger Kuhle (Deutsche Gesellschaft für Internationale Zusammenarbeit GIZ GmbH, Berlin, Germany). Image Source: Wikimedia Commons. May 8, 2021. Construction of the twin apartment high-rises at Kalvebod Brygge in Copenhagen. There will be a common base at the ground with culture, a shop and waste sorting. Photo Credit: Leif Jørgensen. https:// commons.wikimedia.org/wiki/File:Construction_of_Kaktus_Towers_02.jpg

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## Achieving Circularity: Policy Instruments and Regulatory Hurdles

**Gunnar HARTMANN (GH)**: Arup is a multinational services firm providing planning, engineering, architecture, design, and consulting services for all aspects of the built environment. To what extent is Arup involved with the circular economy?

**Martin PAULI (MP)**: There are two pertinent factors in the context of circularity: our project portfolio and our internal-external organizational structure. We are heavily involved with the circular economy services in our climate and sustainability portfolio, where we are globally rooted and locally anchored. The claim that we have methodically incorporated the circular economy's tenets into the projects with our clients is now broadly acknowledged. Also, we are the Ellen MacArthur Foundation's global knowledge partner, focusing on the built environment and all the knowledge and tools that come with it. These resources are current, open to everyone, and published on the online platform. The Circular Buildings Toolkit,[1] which we introduced last year, is one of the most important tools in this context. Here we developed actions for building, structure, façade, and building services, as well as practical design solutions.

**GH**: Where in the world can we currently find the best opportunities to apply the principles of the circular economy to concrete initiatives?

**MP**: There are three main regions. We notice that the largest research pole in Europe is in the Dutch region. Denmark, Germany and Italy are also active, due to their policy backgrounds. In certain initiatives, we actively participate in circular components. We collaborate with major retailers, for instance, but we also collaborate at the municipal level, where building and demolition trash may be sorted, assessed, and put to good use. Then there are clusters in the US, particularly on the West Coast, where many of the larger tech clients are based. All of these are asset-holders and optimize their own assets in accordance with circularity principles. Other tech infrastructure, for instance data

centers, also encompass sustainable development and we work together with them both on the project level and on crucial topics. The third region is the Australian market, where the transportation district is quite prominent. Circular economy concepts, which are increasingly becoming more prevalent in Europe, have been acknowledged as being the only way to successfully implement decarbonization initiatives.

**GH**: When it comes to what policy can do, there are two basic levels: encouraging through financial support, or setting regulatory requirements. What current instruments stand out?

**MP**: The EU taxonomy is currently, at least for us, the most efficient tax instrument. It consists of six parts: biodiversity, circular economy, water, air, pollution prevention, and climate adaption. There are highly specific technological requirements for the construction industry. For example, how much recycled material is required for construction, or whether passports are required for building data. The ingenuity of this steering tool lies in the fact that it steers financial flows to the most environmentally friendly instruments, rather than merely laying out technical requirements for the planner. In other words, while we observe the steering effect, we also observe that it causes certain investors and developers to become more aware.

At the same time, we observe definite progressive advances in the private sector, irrespective of the political instruments. One such area is the HafenCity quarter in Hamburg, where the rules for the competition tender specifically state how circular optimization is to be accomplished. We must always take into account both private and public sectors, as it is assumed that everything is interrelated, but the private sector, for which there are no clear criteria in the building regulations so far, is also making progress. For instance, the manufacturing sector and planners frequently ask questions like “Where is the necessity, which European norms…” etc.

The third actor is the building certifiers, who have a significant guiding impact on sustainability. The German Sustainable Building Council (DGNB), Leadership in Energy and Environmental Design (LEED), and Building Research Establishment Environmental Assessment Methodology (BREEAM) all have their own catalogs of criteria that are based on circularity ideas. The DGNB undoubtedly sets the standard in Germany, but in all honesty, this certification serves merely as a means of “reimbursement” for developers. They utilize it simply to ensure asset prices, because a building with the DGNB certificate can sell more readily than one without it. I would say DGNB has a lot of power, and they use it to speed up the development process.

**GH**: What are some of the current regulatory hurdles to implementing the circular economy?

**MP**: From a purely legal perspective, construction demolition

material is considered waste and falls under waste legislation – not under circularity measures. This is a major hurdle. As a result, the framework criteria for several highly specific policies or areas of activity need to be tightened. For instance, due to tax regulations, we cannot remove facades! This is where I think the policy framework needs to be set or action needs to be taken.

**GH**: Could you give an example of an explicit demand, where we have an exemplary case of political regulation?

**MP**: One of the first nations to scientifically study the CO2 budget up to 2050 is Denmark. Based on backtracking calculations, it can be determined that from budget X, Y amount remains for the construction industry. The results are somewhat perplexing when one considers the volume of construction output and the number of homes actually produced. This then yields a budget for each building. The results show that if construction activity remains unchanged, the budget needed to finance construction activity through 2050 will be exhausted in five years.

So, if we want to maintain the same level of construction output by 2050, we need to reduce total life carbon output by 95%. What has Denmark done? They have set very precise targets in the form of benchmarks. And these now have to be demonstrated throughout the process of getting a building permit. Why is it so ingenious? First, because it ensures climate protection. Second, because it sustains construction production until 2050. As we know, construction production in Germany accounts for 12% of total economic output. It would be unimaginable if we were to lose this level of economic productivity in five years due to climate policy. We now have a concrete target, and it is up to the builders as to whether they can achieve it within these limits.

**GH**: The circular economy requires us to think in processes, i.e., supply chains, life cycle of building components, etc. What do you think we need to achieve circularity?

**MP**: Circularity can only be achieved through methodical digitalization. However, we need to consider digital maturity more realistically. Let's face it, even Arup does not have the BIM models available in a circular format that would allow for material passage in a subsequent session. If we don't believe today that circularity in this area depends on digitalization, then we won't have it in ten years either. In this respect, it is undoubtedly a priority area where adjustments must be made again and again to meet the needs and promote the taxonomy. We must operate with a business model where we must carry out this task on our own, because the investment power in the construction arrangement is currently unable to do so. And therein lies the question of how we should proceed.

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“Traditional approaches in the historical field of infrastructures often focus on the achievements of individual masterminds. But if one looks beyond individual pioneers, the emergence of corresponding expert cultures would appear to signal a much more essential and qualitatively significant leap.”

—Christoph CORNELISSEN, Giacomo BONAN, and Katia OCCHI

Quote from the article “Infrastructures and the Enviroment: Learning From Long-term Cycles. Reflexions From the Early Modern Period to the Present” in Intersecting Vol. 6 by Christop Cornelissen, Giacomo Bonan, and Katia Occhi (Italian-German Historical Institute ISIG, Fondazione Bruno Kessler, Trento, Italy). Image Source: ‘Landschaft mit Bergwerk’, Herri met de Bles (1485/1510 – 1555), oil on wood, Inv.-Nr.: 55 - Alte Galerie, Schloss Eggenberg, Graz. Photography by Fondazione Bruno Kessler, LXII study week | environment and infrastructures from the early modern period to the present: challenges, knowledge and innovation, Sept. 2021 ©.

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## The Impossible Infrastructure Consensus?

Over the past fifteen years, the issue of infrastructure investments has always been in the picture when it came to reigniting global growth. This peaked in 2014, during the G20 Australia and the creation of a designated ministerial Infrastructure Working Group and a collateral infrastructure hub. Yet, the G20 approach has long overlooked how much the production of new infrastructure "for growth" did not necessarily mean corresponding projects would contribute to the reduction of inequalities.

Besides, the question remained: How can we reconcile the production of more infrastructure with other goals, such as the reduction of $CO_2$ emissions or the effective protection of biodiversity?

The G20 established the Seoul Consensus for Shared Growth in 2010, after it was transformed into a forum of government leaders in order to respond to the 2008 global financial crisis.[1]

The Seoul Consensus included a set of six principles meant to support the achievement of the then Millennium Development Goals (MDGs). Following the peak of the global financial crisis, the issue of infrastructure investments was included for the first time in G20 main documents as part of the corresponding multiyear action plan to restore growth. In the following years, until the outbreak of the pandemic and of the war in Ukraine, the annual G20 leaders' declarations have regularly outlined the fragility of the restoration of global growth, with infrastructure investment and financing meant to play a supporting role.

The paradigm of "infrastructure for growth," including mobility, energy, or digital infrastructure, has prevailed unilaterally not only since 2010, but since the early 1990s and the aftermath of the Cold War. It has been a driver to support the global integration of trade and supply chains and a catalyst for the emergence of interconnected urban hubs or global cities. Meanwhile, developed and emerging countries alike have faced a significant decline in social infrastructure, whereas the negative – and cumulative – environmental spillovers of connected planetary infrastructure systems have been assessed only recently within the G20.

In 2022, the G20 presidency of Indonesia and the G7 Germany tried to introduce innovative policy options to strengthen the case for climate finance and deliver on effective low carbon pathways. This new direction includes the just energy transition partnerships (JETP) initiated during the COP26 in

Glasgow and the proposal of a climate club. This could be a turning point to reshuffle infrastructure investments, but achieving a reform of infrastructure finance in the G7 and G20 in the context of 2023 means addressing a fragmented geopolitical landscape where infrastructure plans, such as the G7 Partnership for Global Infrastructure and Investment or the continuation of the China led Belt and Road Initiative (BRI), might no longer connect.[2]

The G20 presidency of India has set up a new overarching priority for infrastructure investments to target sustainable and inclusive urbanization, in India, in the Global South, and even beyond. This innovative systemic approach to urban development that also builds upon a new vision of rural-urban balance was echoed in the Urban X Manifesto introduced at the Global Solutions Summit in Berlin in May 2023. In parallel, we acknowledge the relevance of the model of digital public infrastructure (DPI) experienced in India, providing large-scale and affordable access to digital banking services, which could serve as a credible, operational alternative to profit-based IT companies. At last, the T20 India is pushing for the "LiFE Economy," another denomination for an agenda combining sustainable development, climate action and climate justice, across sustainable consumption and production patterns embedded in the T20 Bhopal Declaration[3] from January 2023. According to the Fourth Sector, a research consortium supporting the LiFE Economy, this approach could greatly benefit the 2030 Agenda, whereas converging assessments, including from the T7 Japan, show an urgent need to reignite the sustainable development goals (SDGs).

Contrary to what the open competition between infrastructure plans such as the G7 Partnership for Global Infrastructure and Investment or the Chinese Belt and Road Initiative looks like, fostering policy coherence across the G7, G20 and beyond is not mission impossible. Alongside national governments and the governance of international financial institutions, contributions at the intersections of the private sector and civil society, including research organizations and think-tanks, could well leverage a much-needed consensus across various "green deals" or their equivalent, for which the continued presidency of the G20 by major emerging economies between 2022 and 2025 could play a critical role. We therefore call for an enduring dialogue between the T20 and T7, as initiated in 2023 by the T20 India and the T7 Japan with the support of the Rockefeller Foundation. In light of the INTERSECTING paradigm, we also call to integrate a fourth infrastructure component in global policy talks, that is, alongside physical (including energy, agriculture and food production), digital, and social infrastructure, the issue of research infrastructure as highlighted by the T7 Japan 2023 Communiqué, to improve our shared ability to measure, monitor and drive systemic, cross-sector policies. Such a vision infuses the evolution of the INTERSECTING model, showcased in the present volume 2, and will nurture the exploration of renewed policy-paradigms at the core of the subsequent volume 3 of this global editorial project.

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“The G20 can play a significant role in forming global consensus on collective policy making in the Global South.”

—Prateek KUKREJA, Rehan Kunal JAGOTA

Quote from the article “Creative Jobs Will Drive the Post-pandemic World of Work” in Intersecting Vol. 10 by Prateek Kukreja and Rehan Kunal Jagota (Indian Council for Research on International Economics Relations ICRIER, India). Image Source: During the World Conference on Creative Economy (WCCE) in Bali, October 5-7, 2022. Display of clothing by Bali-based ‘Superlative Secret Society’ (creators of NFT collectibles, superlative art gallery and designers). Image by courtesy of WCCE, 2022, all rights reserved ©.

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## Cooperation Remains Indispensable for Tackling Global Challenges [1]

For several years now, the state of the world has been characterized as a “perma-crisis.” One crisis supersedes the next, before it is even possible to adequately deal with its consequences. In the last decade, the number of violent conflicts has more than doubled. The UN’s Human Development Index (HDI) 2022 has recorded a decline in global prosperity for two successive years for the first time in its 30-year history.[2] According to the UNDP, 70 million people have fallen into extreme poverty because of the Covid-19 pandemic. Moreover, the number of long-term challenges is constantly growing: from food insecurity and regional fragility to the widening gap between rich and poor, the decline in biodiversity, and the impacts of climate change. At the same time, geopolitical tensions are intensifying, and a great competition for power is driving the fragmentation of international governance.

Given the difficult current situation in the world, there is an even greater need to tackle global problems and provide global public goods. Consequently, international cooperation for sustainable development is more important than ever. No country or single organization can effectively confront these numerous crises and global challenges alone. They call for joined-up thinking and action. We need to respond holistically and develop cross-sectoral and cross-border solutions together. What is required is nothing less than a fundamental and sustainable transformation with a view to bringing about ecological change, overcoming inequalities, and advancing global well-being.

For this, the 2030 Agenda serves as the primary framework. However, halfway through, the future prospects are rather

bleak; many Sustainable Development Goals (SDGs) seem out of reach. That is why we need to double down on our efforts to achieve the SDGs in the spirit of Goal 17, "Partnerships for the Goals." In these challenging times, a robust modus operandi must be established between states that may compete or disagree in other areas to find global solutions to the most pressing challenges. Only strong global partnerships and multistakeholder cooperation will help achieve the SDGs.

Perhaps the main challenge that transcends different policy areas and can only be addressed at a global level is climate change. Yet, the impacts and costs of adapting to the climate crisis are distributed unevenly, with the poorest countries and most vulnerable people being the most affected. In other words, people and states that historically have contributed least to climate change will be hit especially hard by the impacts of global warming. In this regard, the issue of climate justice will be pivotal for the fight against climate change. Only collectively we can find possible paths to a global future with fewer emissions and, at the same time, more equitably distributed prosperity.

Furthermore, linking the green and digital transformations is crucial in order to tackle global challenges. We can leverage the enormous potential of the digital transformation regarding social, economic, and environmental progress. Improving access to technology and knowledge via international cooperation is an important way to share ideas and foster innovation. Working with local partners and end users to take account of the impact of those technologies on specific local conditions is central to mitigating the risks and consequences of digital technologies while at the same time preventing rebound effects. The Principles for Digital Development offer an adequate toolset to utilize digital technologies mindfully and sustainably.

Our last foresight journey has shown that a more inclusive and equitable multilateralism is needed to recouple an increasingly fragmented world and cooperate for global solutions. Effective, open, and rules-based alliances as well as like-minded clubs are viable options. The basis of such cooperation must be the mutual respect for each country's policy space and responsibility when finding solutions. The so-called Global North should adopt a humbler attitude and give due consideration to the needs and interests of its partner countries. Especially in development projects, cooperation has to be on equal terms, with decision-making power distributed more evenly. Practice shows that development projects with local contact structures working at eye level with partners are especially successful. This approach also includes the further strengthening of partnerships that are characterized by their openness to new ideas, mutual trust, and cultural sensitivity. South-South and triangular cooperation are very promising ways to learn about each other's experiences and good practices.

For future-proof and sustainable collaborations, major multi-donor projects are just as vital as multi-stakeholder

partnerships with state and non-state actors. Effective public-private cooperation can mobilize and share knowledge, expertise, technology, and financial resources to support the achievement of the SDGs. In particular, environmental and climate issues, such as energy efficiency, waste management, transport infrastructure, industry 4.0 and the circular economy, present considerable potential for cooperation with the private sector. Seeking new partnerships with civil society organizations, research institutions, think thanks and foundations on the ground will further enhance a locally led development approach. Here, it is paramount that it is made clear who is to do what. Oftentimes, activities of different agencies, ministries or countries overlap, creating confusion for each of the actors involved and thus increasing transactional costs. For joint strategies to succeed, it is of utmost importance to clarify mandates before engaging.

The world we live in demands multi-sectoral and multi-stakeholder approaches and a renewed commitment to respectful and constructive international cooperation. As the following articles show, there are plenty of encouraging solutions, projects and ideas from all around the world. Now, we must reconnect relevant actors, their ideas and solutions by working together to address today's problems, respond faster and become more resilient. Therefore, we should see this era not only as a time of multiple crises, but also of opportunity for more localized, long-term and systemic development cooperation to build our common future.

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1. Disclaimer: This article reflects the personal opinion of the authors.

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“We cannot address this or any future health or environmental emergencies without addressing their social, economic and political determinants. It is as short-sighted to focus on urban development to the detriment to health, as it is to focus on health to the detriment of ecological boundaries.”

—Tolullah ONI

Quote from the article “Planetary Health: Refreshing the Perspective One Year After the Covid-19 Pandemic Outbreak” in Intersecting Vol. 1 by Tolullah Oni (University of Cambridge, MRC Epidemiology Unit, United Kingdom).Image Source: Fragile permafrost, overlooking Yakutsk on a late spring day, Yakutia, Russian Federation. Image by Nicolas J.A. Buchoud, all rights reserved ©.

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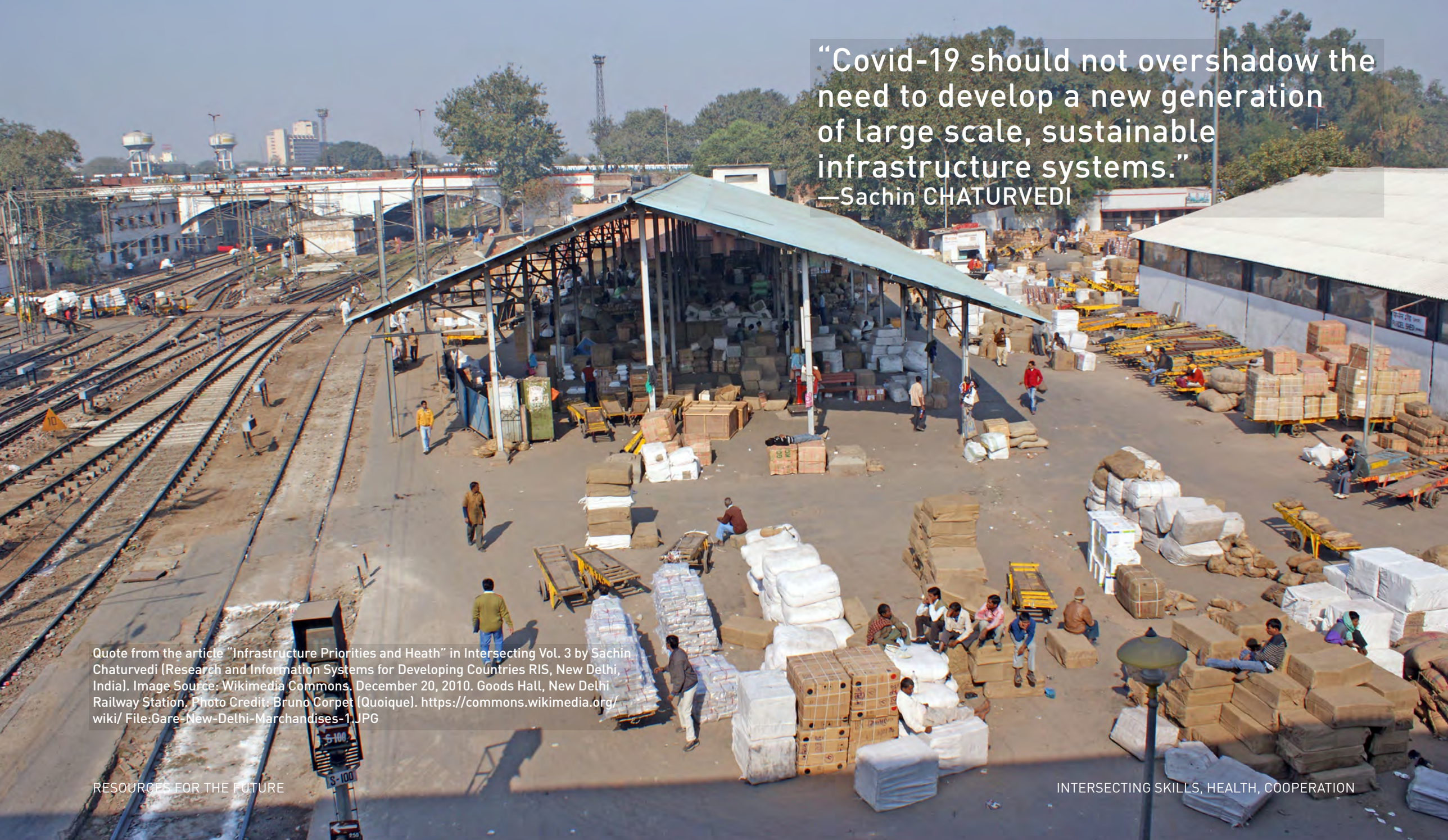

"Covid-19 should not overshadow the need to develop a new generation of large scale, sustainable infrastructure systems."
—Sachin CHATURVEDI

Quote from the article "Infrastructure Priorities and Heath" in Intersecting Vol. 3 by Sachin Chaturvedi (Research and Information Systems for Developing Countries RIS, New Delhi, India). Image Source: Wikimedia Commons. December 20, 2010. Goods Hall, New Delhi Railway Station. Photo Credit: Bruno Corpet (Quoique). https://commons.wikimedia.org/wiki/ File:Gare-New-Delhi-Marchandises-1.JPG

# partners

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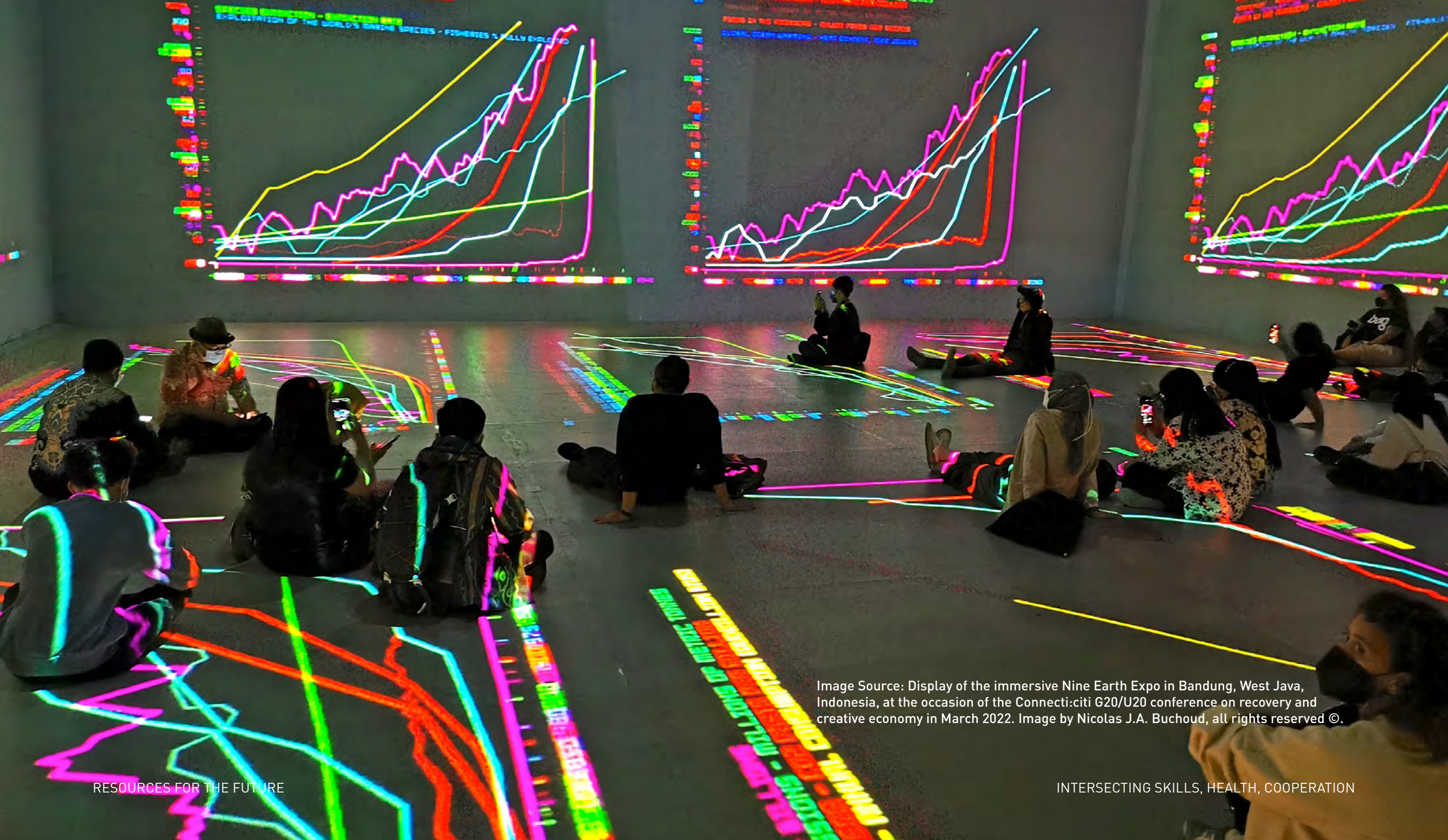

Image Source: Display of the immersive Nine Earth Expo in Bandung, West Java, Indonesia, at the occasion of the Connecti:citi G20/U20 conference on recovery and creative economy in March 2022. Image by Nicolas J.A. Buchoud, all rights reserved ©.

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