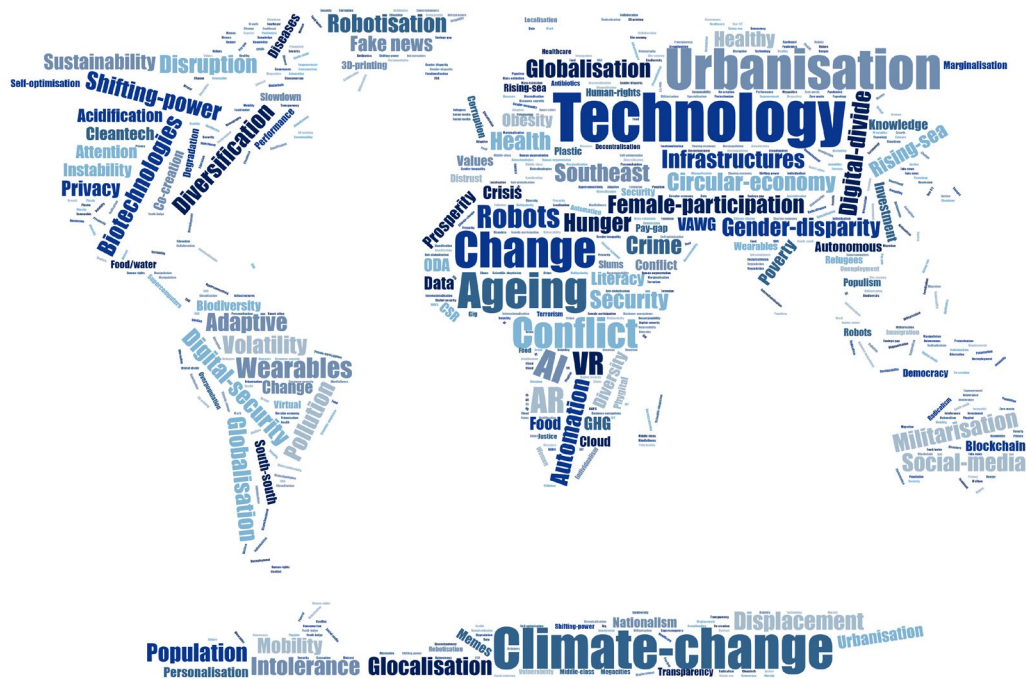


GLOBAL MEGATRENDS

Mapping the forces that affect us all



Oxfam Discussion Papers

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For more information, or to comment on this paper, email the authors: Filippo Artuso at fartuso1@oxfam.org.uk and Irene Guijt at iguijt1@oxfam.org.uk.

ABOUT THE INTERCONNECTED INJUSTICES OF POVERTY SERIES

The world is in the midst of profound changes, challenging long-held perceptions of what is needed to end poverty. Economic growth has reduced global poverty rates in many aspects and locations, but this picture is neither complete or sustainable. It has not solved high levels of economic inequality within and between countries, or ended absolute poverty. While creating incomes for many, it may have increased precarity and vulnerability for more. It has reduced but far from resolved the causes of hunger and malnourishment, creating wide disconnects between what is needed for people and planet to stay healthy and what the food system produces, as well as huge profits for some companies at the expense of the people growing our food, who are often left hungry. It is causing catastrophic levels of environmental damage and climate change, with resource depletion threatening the Earth system on which everyone relies.

The resulting uncertainties and tensions have exacerbated political divisiveness and popular unrest. These interconnected injustices have been and will continue to be recipes for conflict: climate change that escalates resource scarcity and increases uncontrolled migration, rising inequalities that destabilize economies, and increasing polarization that threatens social cohesion. The impacts of these interconnected injustices are worst for those subjected to systemic discrimination of all kinds, particularly on the basis of gender and race.

This series offers a set of concise summaries on the links between the key development challenges and the injustices of poverty. Each paper is written as a series of key questions that are often asked, presenting key definitions, unpacking critical interactions, and offering the latest data on main trends.

Series editor: [Irene Guijt](#), Oxfam Great Britain.

Paper 1. Global Megatrends: The Forces that Will Affect us All

Paper 2. Poverty: Understanding its Definition and Measurement

Paper 3. Understanding the Relationship between Poverty and Economic Inequality

Paper 4. The Gendered Nature of Poverty and Inequality

Paper 5. Poverty and the Threats to Civil and Political Freedoms

Paper 6. People and Planet: Linking Human and Environmental Impoverishment

Paper 7. Conflict, Fragility and Poverty

Paper 8. The Interconnected Injustices of Poverty: An Overview

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EXECUTIVE SUMMARY

Making sense of the rapid changes shaping our world is essential for determining effective strategies. Asking questions about the trends affecting us all can make efforts to reduce poverty and inequality better fit for the future, uncertain though the future is. But to which trends should we pay attention? Many think tanks, international organizations and consultancy companies analyse megatrends. To what extent do these analyses converge or differ? Are they leading to similar insights about the forces affecting us all?

This scan of recent scans offers a simple narrative of four clusters that are considered to drive change: Rapid Technological Development, Demography, Environmental Pressures, and Shifting Power. Many other local, national and regional trends interact with these megatrends. Inherent in trends analysis is uncertainty: no amount of discussion or data can give certainty about their extent, speed or consequences in different parts of the world, or for specific groups of people. However, analysing trends and possible scenarios allows for critical 'what if' thinking, grounded in realism about what is emerging.

The first cluster, Rapid Technological Development, encompasses three main interacting forces that will affect the very fabric of society:

1. Technological Innovation;
2. Hyperconnectivity, which includes the rapid increase of interconnectedness through technological means and the continual intensification of global relations in trade, finance, people and data; and
3. Changing Work, such as the entry of new, technologically literate generations in the workforce, the advent of the gig and servant economies, unemployment risk and job precarity, and education system transformation that reflects these changes in the job market.

In the literature, technological development is viewed as a possible means to mitigate the effects of climate change and resource scarcity, and as invaluable in improving health services. However, the challenges posed by technological innovation include the loss (and creation) of jobs through automation, the threats to data security and privacy – as personal data are increasingly shared – and the limited abilities of institutions to address these new realities.

The second cluster, Demography, includes:

1. Demographic Shifts, such as an ageing global population, with an imbalance towards an elderly population in high-income countries (HICs), and continuous population growth, with a high proportion of young people in low- and middle-income countries (LIC/MICs);
2. Urbanization;
3. Migration of all kinds; and
4. Health Challenges.

Globally, basic health trends have been consistently improving over the past two decades, with medical developments expected to sustain progress. However, ageing populations are becoming tough challenges in HICs, as the workforce shrinks and healthcare costs increase. The migration that might compensate for this is often perceived as negative in these same countries, and opposed by populist and nationalist forces.

The third cluster, Environmental Pressures, includes the pressures that people exert on the natural environment, as well as the resulting impacts on people. These fall into two main camps:

1. Climate Change; and
2. Resource Scarcity.

Development – and the related depletion of resources – has increased quality of life for many. But it has also led to alarming levels of environmental damage and climate change, threatening the Earth system on which humanity depends. The effects of climate change are inevitable, with recognized impacts on the incidence of climate-related disasters, including droughts and flooding, rising sea levels and ocean acidification. Climate change is not only affecting the scarcity of mineral and energy resources, but also food and water. It is accelerating the loss of biodiversity already set in motion by over-exploitation and over-consumption. Such scarcity might exacerbate conflicts and particularly affect the poorest and most marginalized people.

The fourth cluster, Shifting Power, encompasses socioeconomic and political trends:

1. Multipolarity, which includes the (re)emergence of global actors, and in particular the gravity of the economy shifting due to the rapid growth of China. It also includes the tension between the forces of globalization and the growing voices calling for localism or decentralization;
2. Economic Inequality within and between countries;
3. Conflict; and
4. Crumbling Social Cohesion, with societies more polarized and people more entrenched in their positions, increasing distrust in institutions (political and scientific), and a general upsurge of nationalist and populist political forces.

These four clusters describe the key dynamics as reflected by the megatrends literature. The paper does not discuss each trend and sub-trend in-depth, nor do we necessarily agree with how trends are portrayed. Gaps exist in the literature, for example around gender-related trends, civic freedoms, the consequences of mass education at all levels, and the nature and drivers of conflict. Some trends are presented more positively than we think will be the case, as the relevance of trends for poverty and inequality are not considered in many scans. Nevertheless, the literature shows a strong convergence around a number of trends, that we believe organizations should be exploring.

Organizational decisions taken today on thematic or geographic priorities can be assessed to check whether they sufficiently recognize the inevitability of these trends, even if their precise rates or impacts are unknowable. An organization can put trends analysis to work through six tasks:

1. **Identify trends not on the radar.** Which of these trends are on the organizational radar – explicitly – in terms of their possible implications for thematic, geographic and operational choices? Which are being ignored or should be taken more seriously? Given that the megatrends discussed here come with in-built biases, what other trends are key when working on ending poverty and reducing inequality?
2. **Focus on (virtual) geographies that matter.** How might these megatrends look in each region and country, mindful that data may not be available on all trends? With the emergence of digitization and urbanization, does a focus on nation states still make sense, or will megacities become the new ‘states’? Might virtual communities become more powerful ‘change hubs’ than geographic communities?
3. **Think through impacts on different groups of people.** How might these megatrends – individually and together – affect poor and marginalized populations, especially women and girls? For whom are impacts happening now or in the near future – and what does this mean for how to support those struggling under conditions of poverty or social marginalization?
4. **Figure out opportunities and challenges using a systems perspective.** While each megatrend could potentially help or hinder, it is in the interaction of trends that the real

effects will be felt. What do we assume about each megatrend and how it will affect, or be affected by, others? What new options can emerge within these interactions to tackle poverty and inequality?

5. **Decide which trends to take on and what roles to play.** All these trends will affect any work and they are all inherently political. What role can and does an organization want to play? What kind of agent of change and what kind of change does it want to support in relation to each megatrend?
6. **Reimagine partnerships, roles and possibilities.** With the emergence of new global powers, economic drivers and geographies of action, are new partnerships being spotted and fostered effectively to shape the role of NGOs?

1 INTRODUCTION

The world is in the midst of rapid changes that are influencing how people communicate, create, produce, exchange, think and decide. These forces are profoundly reshaping human relations within societies, between locations, and with the natural environment. Awareness of such forces is critical. Whether people are conscious of them or not, their understanding of what is happening today deeply affects both their perception of the past and what they think is needed for the future they want.

Humanity and the entire Earth system are being confronted with immense challenges resulting from the drive for economic growth (see Oxfam's *Interconnected Injustices of Poverty* papers, forthcoming). Such development has reduced global poverty rates in many aspects and in many locations, but not economic inequality (Alejo Vázquez Pimentel et al., 2018) or absolute poverty numbers (Hickel, 2019). While offering greater incomes to many, it may have increased precarity and vulnerability for more. It has reduced but far from solved the causes of hunger and malnourishment, creating wide disconnects between what people need to stay healthy and what current food systems produce (Woodhill et al 2020). It is causing alarming levels of environmental damage and climate change, with resource depletion threatening the Earth system on which everyone relies. The related uncertainties and tensions are linked to political divisiveness and popular unrest, with impacts worst for those subjected to systemic injustices, including gender-based inequalities of all kinds.

Box 1: Defining 'megatrends'

Megatrends are '*large, transformative global forces that define the future by having a far-reaching impact on business, economies, industries, societies and individuals*' (EY, 2015).

Oxfam is undertaking a strategic planning process that will guide the priorities of its global confederation for 2020–30. To be fit for the future given these global challenges and opportunities, the process must be informed not only by what is known about the past from research and evaluations, but also by knowledge of emerging 'megatrends' (see **Box 1**).

This study is a 'scan of scans' – a meta-analysis comparing recent scans of megatrends conducted by established consultancies, civil society organizations (CSOs), think tanks and academics. It offers an overview of the most-cited megatrends from key reviews. It identifies main areas of consensus about the megatrends shaping the future and highlights key interlinkages and some caveats. It also considers the possible consequences – positive and negative – for the work of CSOs, including international NGOs such as Oxfam, and their poverty and inequality reduction efforts.

The discussion is not Oxfam's position on megatrends and their sub-trends. It was an input for those involved in Oxfam's strategic planning process to consider priorities – thematically, geographically and operationally. It is now intended to be a useful tool for others working on social justice and development.

SOURCES

Box 2 lists the 22 megatrend reports that we included in the analysis. Five criteria were used to select only sources that were:

1. **megatrend-focused;**

2. **recent**, i.e. from 2016 onwards;
3. **universal**, i.e. identified megatrends affecting all locations and sociodemographic groups;
4. **multi-trend**, i.e. overviews of many trends, which included thematic studies that analysed how future trends would affect, for example, food or technology; and
5. **future-looking**.

These choices mean this review has several caveats. First, we do not know or are unable to account for the methodologies used by the sources in selecting the megatrends. Second, prioritizing megatrends rather than regional or thematic scans mostly led us to analyses produced by international and OECD-based institutions that focus on issues of relevance for high-income countries, with biases towards measurable economic topics.

One notable gap in the literature relates to power issues, particularly a lack of recognition of gender dynamics within trends and as trends. Such gaps in the literature are inevitably replicated in our clustering and description, and we have highlighted these in the document (see the **Critical Notes** sections for each cluster). We did not include literature about individual megatrends – there is much to say on each of these from other sources. We were keen to simply see where there was consensus or not about megatrends, and how these were being reported.

Box 2: The selected sources

BlackRock. (2018). *Megatrends: A Research Study Looking at Structural Shifts in the Global Economy and How They Affect Our Investment Thinking.*

Boumphrey, S. and Brehmer, Z. (2018). *Megatrend Analysis: Putting the Consumer at the Heart of Business.* Euromonitor International.

Deloitte. (2017). *Beyond the Noise: The Megatrends of Tomorrow's World.*

Dugarova, E. and Gülasan, N. (2017). *Global Trends: Challenges and Opportunities in the Implementation of the Sustainable Development Goals.* UNDP and UNRISD.

EEA. (2018). *Global Megatrends and Planetary Boundaries.*

EU Commission. (2018). *Competence Centre on Foresight - Megatrends Hub.*

EYQ. (2018). *What's After What's Next? The Upside of Disruption: Megatrends Shaping 2018 and Beyond.*

FAO (2017). *The Future of Food and Agriculture: Trends and Challenges.*

Forum for the Future (2019). *Driving Systems Change in Turbulent Times: The Future of Sustainability 2019.*

Laudicina, P., Peterson, E., and Rickert McCaffrey, C. (2018). *Competition, Disruption, and Deception: Global Trends 2018 – 2023.* A.T. Kearney Global Business Policy Council.

McKinsey & Company. (2017). *McKinsey Special Collections: Trends and Global Forces. Selected Articles from the Strategy and Corporate Finance Practice.*

OECD. (2016). *OECD Science, Technology and Innovation Outlook 2016.*

Pano, L. A. (2019). *The Changing Faces of Aid: 4 Trends that May be Widening Inequality.* BOND.

PWC. (2019). *Megatrends.*

- Retief, F., Bond, A., Pope, J., Morrison-Saunders, A., and King, N. (2016). *Global Megatrends and Their Implications for Environmental Assessment Practice*. Environmental Impact Assessment Review 61, 52–60.
- Smiths Group plc. (2019). *Megatrends: Megatrends Informing Our Strategy*. Sydney Business Insights. (2019). *Megatrends*.
- Trend One. (2019). *Mega-Trends*.
- UN DESA. (2019). *Sustainable Development Outlook 2019: Gathering storms and silver linings*.
- Wall, S. (2018). *Megatrends: Predicting the Future to Reinvent Today*. HP.
- Winston, A. R. (2019). *The World in 2030: Nine Megatrends to Watch*. Massachusetts Institute of Technology Sloan Management Review.
- Z_punkt. (2019). *Megatrends*.

METHODOLOGY

The sources discuss megatrends in ways that make collating and summarizing far from straightforward. While some sources zoomed in on specific megatrends, most sources struggled to describe them as standalone phenomena, instead discussing them as sets of interacting phenomena. We had to find a way to categorize the megatrends, disentangling the narratives to show how the megatrends and sub-trends are related.

We had to establish our own categorization method to understand and structure the literature, and to compare the trends described in them. The methodology (see **Annex 2: Methodology**) enabled some quantification of qualitative observations. In short, we asked three questions:

1. **What are the actual megatrends?** The labels for megatrends that structure this paper were identified from recurring key words or phenomena. The labels we use are broad descriptors of phenomena that encompass the similarities found in different sources, even if these might describe megatrends with slightly different terminology.
2. **What is the relative weighting of the labels – are they all megatrends or are some sub-trends?** We created ‘mentions’ of a trend by using the labels to describe a certain piece of text. Each piece of text was allowed up to five labels, given they often described interacting phenomena. The result of our quantification process is shown in **Figure 2**, which lists the megatrends according to their average points.
3. **How do these megatrends and sub-trends relate?** We clustered the megatrends around four headings, each of which offers a digested reading of our sources: Rapid Technological Development, Demography, Environmental Pressures and Shifting Power.

Box 3: Stylistic choices

The source texts use varying terminology to describe countries: low- to high-income, emerging economies, Global South or Global North, developing or developed, etc. We use low-income, middle-income, or high-income countries (LICs/MICs/HICs), unless directly quoting the literature.

We use capital letters to refer to the megatrends (for the analysis and clarity of structure) as distinguished from the lower case to refer to the phenomena the trends describe.

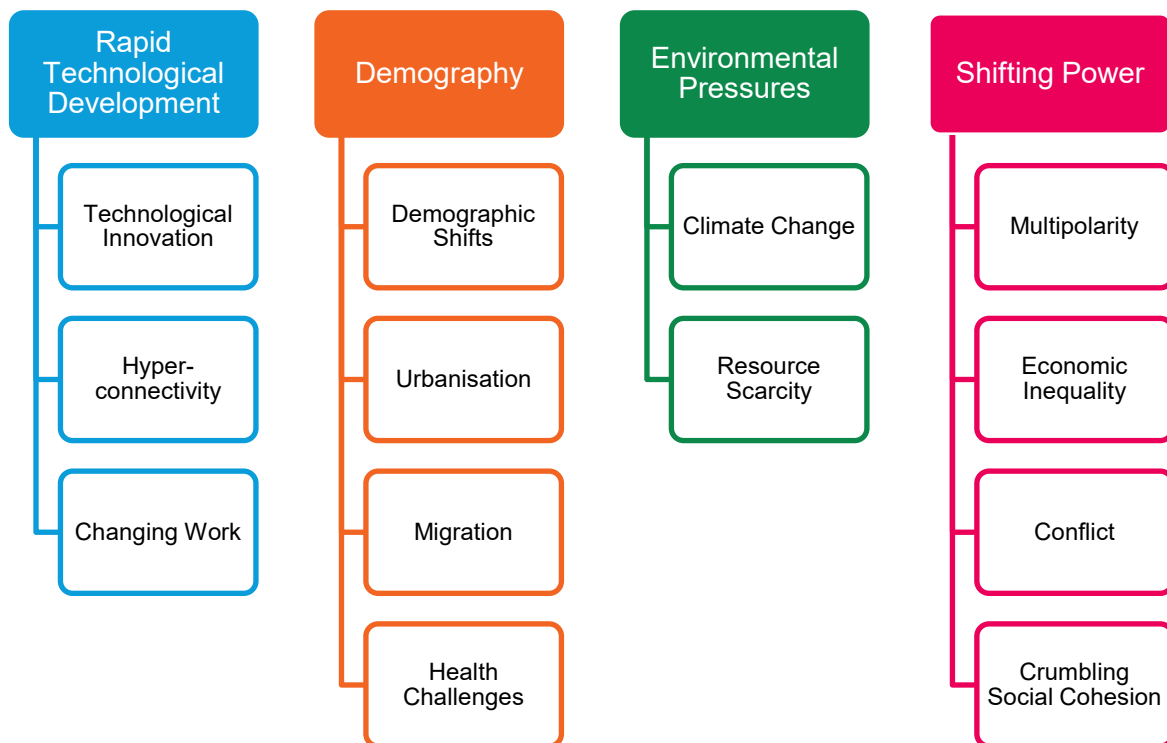
The four clusters

The criteria for dividing megatrends and their sub-trends into clusters were:

1. the consensus around trends emerging from the analysis; and
2. the scope of the trends, with some megatrends being further divided into sub-trends.

Figure 1 summarizes the four clusters and their megatrends. A more detailed version of the cluster structure is shown at the beginning of each chapter.

Figure 1: The four megatrend clusters



The four clusters are discussed in an order that reflects consensus in the literature, but trends with a higher consensus might appear later in this paper if they are part of a cluster with a lower total consensus when all trends contained in that cluster are considered. An extensive list of the trends is shown in **Figure 38** (see: **Annex 2: Methodology**): the figure lists megatrends according to an average score that conveys their relative importance within individual sources and the overall degree of consensus in the literature.

Making sense of the megatrends literature involved three tasks: (1) seeing how trends interconnected, (2) assessing the extent and nature of consensus, and (3) describing the megatrend clusters. For the first two tasks, the authors developed a simple quantification process involving subjective clustering of text fragments. The final classification, therefore, represents the authors' reading of the sources. Consensus refers to agreement in the literature on those forces most likely to shape our collective future. It does not reflect their relative impact. For example, the greater consensus around Technological Innovation as a megatrend does not mean it will have more impact than Climate Change.

The clusters are a simplification of complex interconnected phenomena, with causal relationships across the clusters. The next four chapters describe the clusters in terms of the most cited megatrends and associated sub-trends. Overall, the literature makes for bleak reading; megatrends are discussed mainly as threats rather than opportunities. We have included any positive perspectives, where mentioned, and critical comments on the literature.

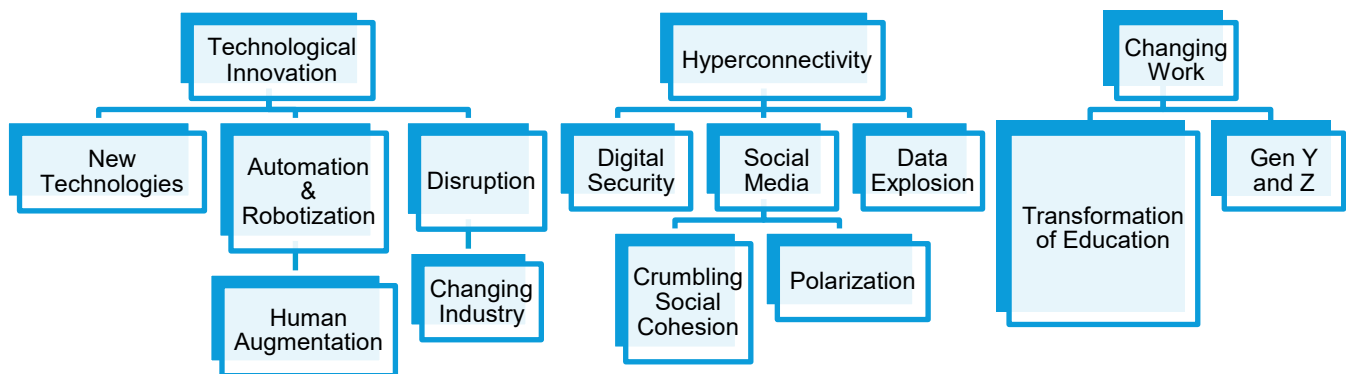
2 RAPID TECHNOLOGICAL DEVELOPMENT

The Rapid Technological Development cluster (**Figure 2**) includes the Technological Innovation, Hyperconnectivity and Changing Work megatrends, and the sub-trends:

- New Technologies;
- Automation and Robotization;
- Disruption;
- Digital Security;
- Social Media;
- Data Explosion;
- Transformation of Education; and
- Gen Y and Z.

This cluster includes a variety of forces that originate from new technologies and innovation, and their repercussions on all social and economic aspects of life.

Figure 2: Rapid Technological Development megatrends and sub-trends



2.1 TECHNOLOGICAL INNOVATION

The idealization, development and deployment of new technology for public and private use.

Technological Innovation is the megatrend on which there is most consensus in the sources. Its first sub-trend, New Technologies, provide incredible opportunities for business development and research through: Automation; The Internet of Things (IoT); Artificial intelligence (AI); Blockchain; Autonomous vehicles; Drones; Robots; Virtual reality (VR); Augmented reality (AR); Sensors; 3D printing; and Wearables.

Technologies have such a profound effect that they are 'changing the nature and speed of new scientific discoveries and are transforming systems of production, management, and governance' (EU Commission, 2018). Notably, the most ground-breaking technological

developments come from a 'combination of seemingly disparate inventions and disciplines' (McKinsey & Company, 2017).

Human Augmentation, a field of research that studies medicine and technologies able to enhance human abilities, is leading a new wave of disruptive technologies (EU Commission, 2018; Ernst and Young, 2018; FAO, 2017). Indeed, technological innovation will probably develop in the direction of a 'blended reality': building on conversational interfaces and 'humans 2.0, with higher personalization of everything' (Wall, 2018). These technologies have the power to strongly modify people's perception of – and relation with – themselves and society: the 'blur between humans and machines realigns societal norms and challenges entrenched perceptions of ourselves' (EYQ 2018). This phenomenon forces people to reframe the relationship with technology in terms of autonomy, identity and privacy. The world is experiencing an increasingly 'pervasive dependence on technology for everything, from social interaction to transactions to health monitoring' (Deloitte, 2017).

Technological Innovation is central in shaping the direction of most other trends; it is stimulating Hyperconnectivity, and is revolutionizing production, economies and societies. Such innovation simultaneously exacerbates problems and offers solutions for problems in other trends, from resource scarcity to local, regional and global conflicts (see **Chapters 4 and 5**). Therefore, how to harness technological development is one of the most important challenges that regulators and policy makers will face in the coming decades.

As a consequence of technological innovation, the world is witnessing an accelerating change in social and economic structures. According to PWC (2019), 'emerging technologies and global megatrends are colliding to disrupt both business and society'. The concept of Disruption – both as disruptive technologies and industry disruptions – is frequently found in the megatrends scans reviewed. However, as put by McKinsey & Company (2017):

'Disruption' isn't just one of the most overused words in management writing; it's also one of the most imprecisely used. When we say industry disruption is accelerating, we mean that in many sectors, critical foundations of industry structure – the economic fundamentals, the power balance between buyers and sellers, the role of assets, the types of competitors, even the borders of industries – are rapidly shifting.

Taking it from a consumer's perspective, Christensens (2019) defines disruptive innovation as '[allowing] a whole new population of consumers at the bottom of a market access to a product or service that was historically only accessible to consumers with a lot of money or a lot of skill'. The technology of Hyperconnectivity has fostered the creation of platforms that, combining both demand and supply, 'are changing industry structures, such as those within the sharing economy' (Dugarova and Gülasan, 2017). These social platforms are radically changing the way in which people 'communicate, interact and organize their lives' (Sydney Business Insights, 2019).

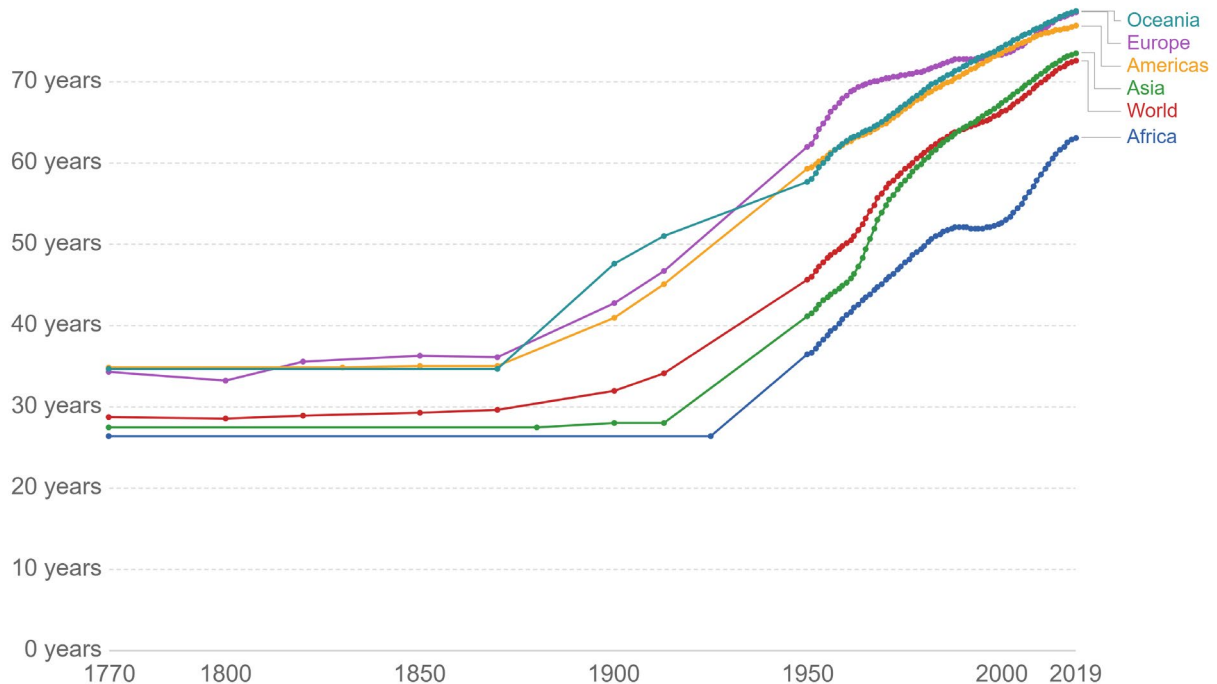
By creating new and unforeseeable entities and business models, this disruptive process is also deeply challenging regulators. It forces them 'to reconsider and recalibrate the delicate balance that regulations strike between the competing interests of different constituents', inducing a shift from static to adaptive forms of regulation (EYQ, 2018).

Positive perspectives

New technological solutions might help feed growing populations, increasing food security through greater agricultural productivity or, more generally, addressing Resource Scarcity (see **Section 4.2**) by 'prompting new and innovative ways of managing, saving, and in some cases creating new resources to mitigate growing challenges' (Deloitte, 2017). Indeed, many of the sources express the belief that Technological Innovation holds the potential to answer the challenge of Resource Scarcity, possibly by transforming resource production, increasing the

efficiency of supply chains and reducing resource consumption (ibid.; EU Commission, 2018; McKinsey & Company, 2017; Retief et al., 2016). Technology is also central for the comprehensive and fast diffusion of knowledge, stimulating new business practices, increasing research, development and production, and facilitating competition for talent and migration (OECD, 2016). While the benefits of Technological Innovation are tangible in most fields, they are most prominent in medicine and health. For example, technology has helped increase life expectancy to levels that were unimaginable 100 years ago (Roser, 2015; see **Figure 3** and **3.4 Health Challenges**).

Figure 3: Life expectancy has been increasing globally since 1770



Note: Life expectancy at birth, i.e. the average number of years a newborn would live if the pattern of mortality in the given year were to stay the same throughout its life.

Sources: Riley (2005), Clio Infra (2015) and UN Population Division (2019). Graphics: Roser (2019).

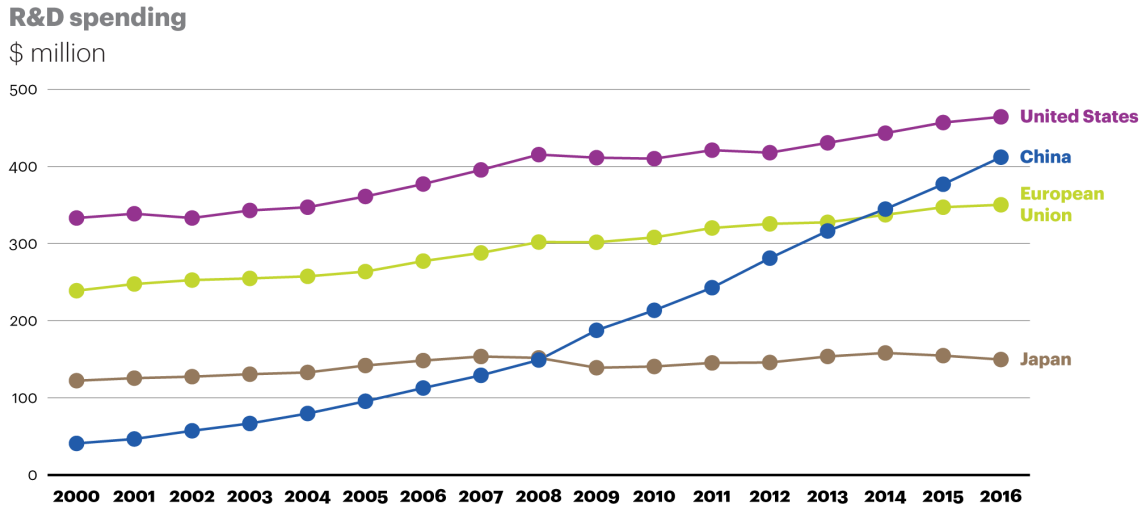
Negative perspectives

Technological Innovation is considered a vital asset for competing powers on the global stage. Indeed, a ‘battle for technological supremacy’ between the main international actors poses a serious security risk (Laudicina et al., 2018): ‘the United States and China have emerged as the dominant players in the race for hegemony in the Fourth Industrial Revolution’, in a fight in which ‘the winner will have outsized influence – with economic, political, and military implications for years to come’ (ibid.; see **Figure 4**).

The megatrend of Technological Innovation is also intertwined with Conflict, with technology predicted to change the face of wars through robotic weapon development, possibly resulting in the dehumanization of conflicts, and an increasing incidence of cyber-attacks. According to The Economist’s *Global Risk Scenarios* (2019a), cyber-attacks and data integrity concerns might one day disable large parts of the internet.

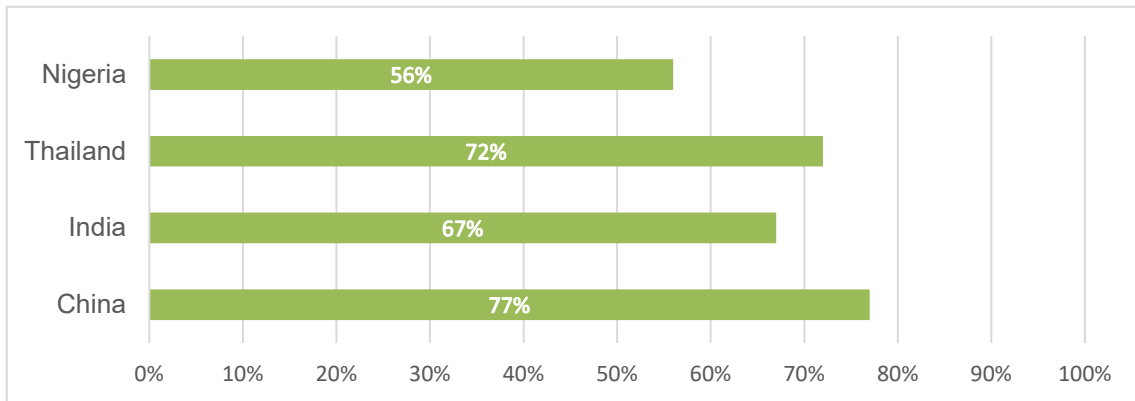
Another negative aspect of technology involves the effects of automation. Automation in the workforce is challenging governments and businesses to reinvent job markets and welfare systems (**Figure 6**), with impacts particularly on the growing young populations in emerging economies (**Figure 5**). The loss of jobs will be ‘particularly harsh in rural areas’ but may also result in ‘growing inter-urban inequalities due to skill polarization’, requiring societies to consider options for the ‘education [of] workers in automatable positions’ (OECD, 2019).

Figure 4: China on track to lead the world in research investments



Source: OECD; A.T. Kearney analysis. Graphics: Laudicina et al. (2018, p. 3).

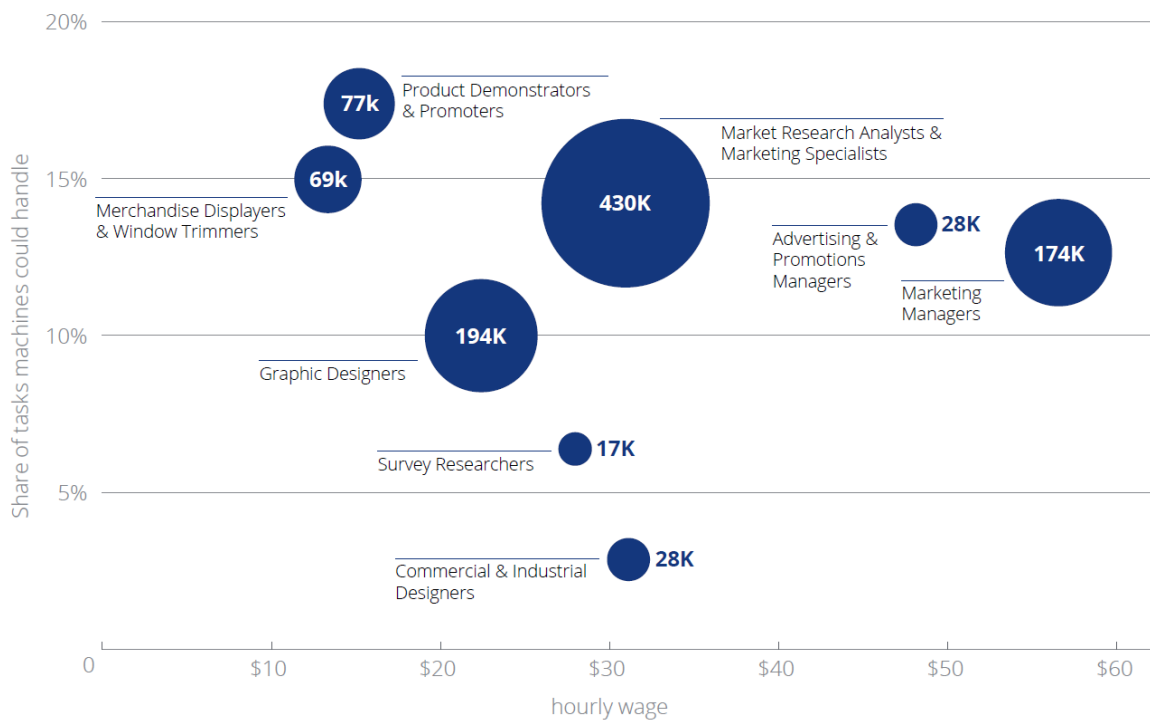
Figure 5: Share of jobs at risk of automation in specific emerging markets



Source: Citi (2016) and World Bank (2016), cited in EYQ (2018).

Figure 6: Automation could change the face of numerous jobs

Note: Circles represent number of people in specific employment.



Source: Harvard Business Review (2016). Graphics: Deloitte (2017, p. 17).

2.2 HYPERCONNECTIVITY

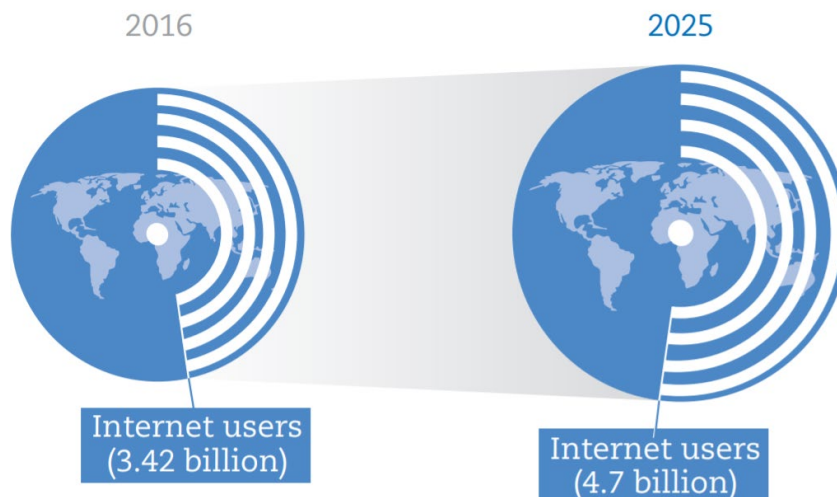
The rapid increase of connectivity through technological means and continual intensification of global exchange in trade, finance, people and data.

In the literature, this rapid increase of connectivity is described in two ways:

1. an increase of interconnectedness through technological means, particularly with growing numbers of people having access to the internet (**Figure 7**) and accelerating use of social media; and
2. the continuous increase of global exchange in trade, finance, people and data (this also relates to the Globalization sub-trend, see **5 Shifting Power**).

Hyperconnectivity is thus a vague concept that acts as a basic driver of multiple social and economic forces. It offers great potential for change, 'empowering individuals to engage in decision making, thereby potentially shifting power from the traditional elites to the broader population' (Retief et al., 2016). However, its influences can be diverse and seemingly opposing. A case in point is the seeming contradiction between the increase in the globalizing power of interconnection, and the simultaneous increase in the flows of people, capital and information that fosters the anti-globalization forces that call for localization (McKinsey & Company, 2017).

Figure 7: Internet users are predicted to reach 4.7 billion by 2025



Source and graphics: OECD (2016, p. 9).

Hyperconnectivity relies on new technologies, such as smartphones, with the ability to keep people connected at any time anywhere. These new technologies allow for ‘unprecedented opportunities for data collection, analysis, and dissemination’ (Dugarova and Gülasan, 2017). It is difficult to grasp the magnitude of this Data Explosion. According to Sydney Business Insights (2019), ‘90 percent of the world data has been created in the last 2 years’. The increasing amount of data and information could have revolutionary effects on society: according to BlackRock (2019) ‘data is the new oil’ and the ‘key enabler of this fourth industrial revolution’. The Data Explosion opens new questions regarding data management, inequality, digital security and privacy.

First, the increasing amount of data calls for new ways of handling it, requiring smarter approaches for analysis, particularly with the help of AI (PWC, 2019). Second, the use of technologies and selection of data sources in AI development needs to be carefully planned in order ‘to avoid a reporting bias favouring more advantaged people and thus widening the gap between the “data poor” and the “data rich”’ (IEAG, 2014, cited in Dugarova and Gülasan, 2017). Note that the digital divide cannot be reduced by ‘simply providing more and better technological devices and connectivity... [but it is] also important to address equity, including gender divides, and the quality of teaching and learning’ (Dugarova and Gülasan, 2017). Third, the massive amount of data people share daily (through social media, customer cards and other online tools) raises privacy concerns. ‘Our world will become even more open – and less private’ writes Winston (2019), stressing that the exponential growth of data will mutually reinforce ‘the pressure to share that information – with customers and consumers in particular’. While data analysis will facilitate some decision making, ‘all these tools will shatter privacy in the process’ (ibid.). The implications for digital security are discussed further below.

Positive perspectives

The instant and borderless flow of information enabled by Hyperconnectivity is prompting forms of technology democratization that fuel scientific advancement, expand business opportunities and increase access to services. Models and structures of enterprise are shifting due to the democratization of the tools of production, thanks to decreasing costs of technology, and towards a ‘more open and collaborative production environment’ (Deloitte, 2017). The expansion of the IoT (i.e. devices connected to the internet that can often communicate between each other) is stimulating forms of a sharing economy, characterized by the emergence of collaborative models of consumption. The IoT is also creating ‘smart cities’ – spaces where ICT is used to increase quality of urban services – while technologies such as

Social Media are creating new spaces for debate 'beyond physical borders on ideological platforms' (ibid.).

Digital connections through social media played a key role in stimulating bottom-up civil society responses through spontaneous movements, notably by mobilizing and coordinating collective action, including the Arab Springs, Occupy Wall Street, Black Lives Matters and Extinction Rebellion (cf Gerbaudo, 2012; Chrona and Bee, 2017). According to Trend One (2019), feminists have been able to leverage digital connectivity to make a feminist voice heard on important issues, 'exposing structural inequalities in society, the compatibility of family and career choices, full control of one's own body, the gender pay gap and sexualized violence', eventually becoming 'part of a globally connected popular culture'. Finally, greater and quicker connectivity allows for increased transparency, generating spaces in which companies and governments can be held accountable.

Negative perspectives

More connected financial and economic systems increase market volatility, and the speed at which economic crises spread. Social Media are remodelling how people perceive and assimilate information, reducing the significance of traditional media in the public discourse, while fostering an 'attention economy', in which emotional responses are stimulated at the expense of rationality. This 'onlife', the dimensions of life shaped by relationships with Information and Communication Technology (ICT), has a 'dark side [which] is expressing itself in our politics, our mental health, our screen addictions and our social cohesion' (Forum for the Future, 2019). It is causing a societal Polarization particularly aggravated by the promulgation of fake news and mass manipulation. Deloitte (2017) describes this as a negative societal phenomenon:

Fuelled by individual empowerment, access to information and communication technologies, and growing wealth inequalities, the world is seeing a rise in ideology as people and communities seek dramatic change from the status quo. As individuals engage increasingly over social networks due to the proliferation of ICT technologies, networks of ideological thinkers are no longer constrained by proximity and are able to grow exponentially with new followers who seek sources of insight online.

Indeed, if Social Media can be a positive aggregator of social movement forces, it can also become a political space controlled by a government, as demonstrated by the army of Myanmar, which used Facebook to spread hate during the Rohingya genocide (Mozur, 2018). Also, as the internet becomes a space for organizing and managing protests, it can also be used as a governmental tool for control and repression, as shown by the internet shutdowns in Iraq and Iran in October and November 2019, respectively (Chulov, 2019; Daragahi, 2019).

Hyperconnectivity and the explosion in the quantity of digital data have serious repercussions for Digital Security. The development of more powerful technologies such as quantum computers – able to process exponentially more data compared to classical computers – or AI are viewed with concern in the literature. For example:

[AI] carries significant risks, such as disintegration of individual privacy, lack of agency and control, increasing threats to cybersecurity, prolonged social disorder, and many others, challenging governance and democracy.

EU Commission, 2018

Greater connectivity means increased vulnerability, both in the private and business spheres (PWC, 2019). Easy-to-intercept communications that carry important data are a 'favourite target of cyber criminals', which 'creates constant challenges for software engineers' (Trend One, 2019). With an increasing portion of people's lives and data online, the protection of privacy and

private property is becoming a concern for the digital space, just as much as the physical one (ibid.).

2.3 CHANGING WORK

Changes in the type and ways of working and workplaces, mostly due to technology, which affect economies and societies.

Ways of working are changing in a way that might impact society, and the Changing Work megatrend is primarily mentioned in connection with Automation and Robotization, Hyperconnectivity, and a number of trends in the Demography cluster. Businesses and governments will face significant opportunities and challenges ‘as the largest generation in history, millennials – those born between 1985 and 1995 – drive the economy’ (Sydney Business Insights, 2019). Young people entering the workforce and older people staying longer are changing ‘employment, careers models, and organizational structure’ (EU Commission, 2018). Generations Y and Z (i.e. millennials and the following generation) are bringing to the workplace knowledge and experience with the tools that are making Hyperconnectivity possible. Millennials ‘have far greater expectations of working internationally than their older counterparts... with 93% in Africa, 81% in Latin America and 74% in the Middle East all saying that they would like to work outside their home country at some point in their career’ (PWC, 2018).

On the technological side, Automation and Robotization will transform and disrupt industries, altering their workforce needs. As an example, ‘AI will create some new kinds of jobs but will also nearly eliminate entire segments of work, from truck and taxi drivers to some high-skill jobs such as paralegals and engineers’ (Winston, 2019; see **Section 2.1** on Technological Innovation). The changing shape of the labour market will mostly affect the young generations of emerging economies, particularly those with less access to education (see **Figure 8**).

These trends are driving a transformation of education. In a digital and hyperconnected world in which ‘an increasingly knowledgeable society is exponentially rising the amount and quality of knowledge that becomes ubiquitously available’, educational needs and modes of delivery are rapidly changing (EU Commission, 2018). In many professions, automation requires an increased level of specialization and creativity for workers to retain their jobs. As a consequence, while education becomes increasingly focused on technical subjects, a more ‘specialized global workforce will emerge, and education systems will become a more important determinant of national competitiveness’ (Laudicina et al., 2018).

Positive perspectives

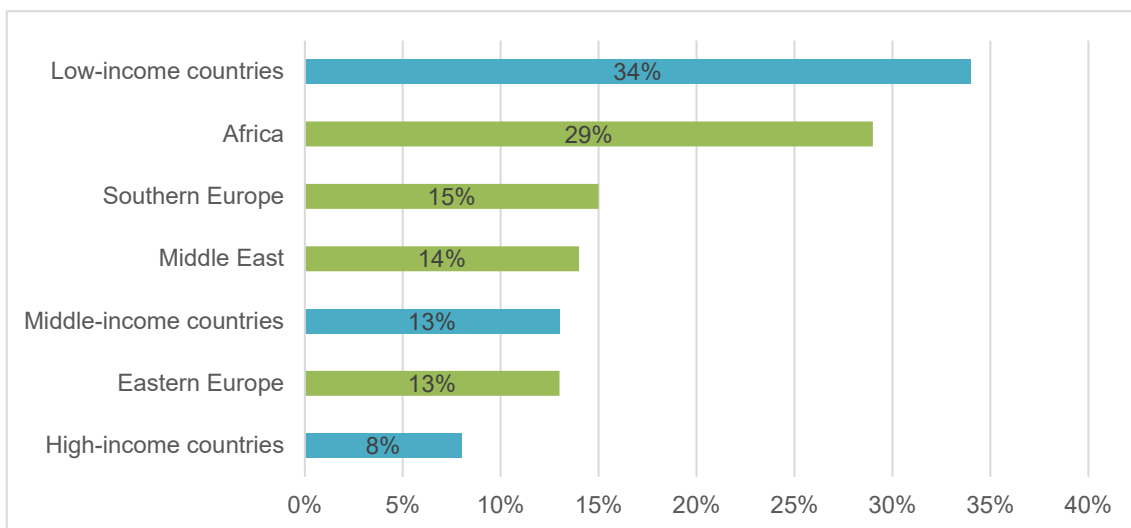
Technology and digitalization are giving an advantage to newer generations ‘who more quickly adopt the change’ (Deloitte, 2017; see **Figure 9**). Moreover, although technologies like AI threaten to replace part of the workforce, it also creates ‘a potential for new and emerging industries and opportunities [that] is greater than ever before’ (BlackRock, 2018).

Part of the literature identifies a possible future increase in female participation in the formal workforce, although this is a trend that varies greatly across locations (Ospina and Tzvetkova, 2017). There are also mentions of increasingly powerful roles for women, with rising participation in leadership positions across the public and private sectors, and ‘as emerging as an important economic sub-group in developing countries’ (Deloitte, 2017).

Negative perspectives

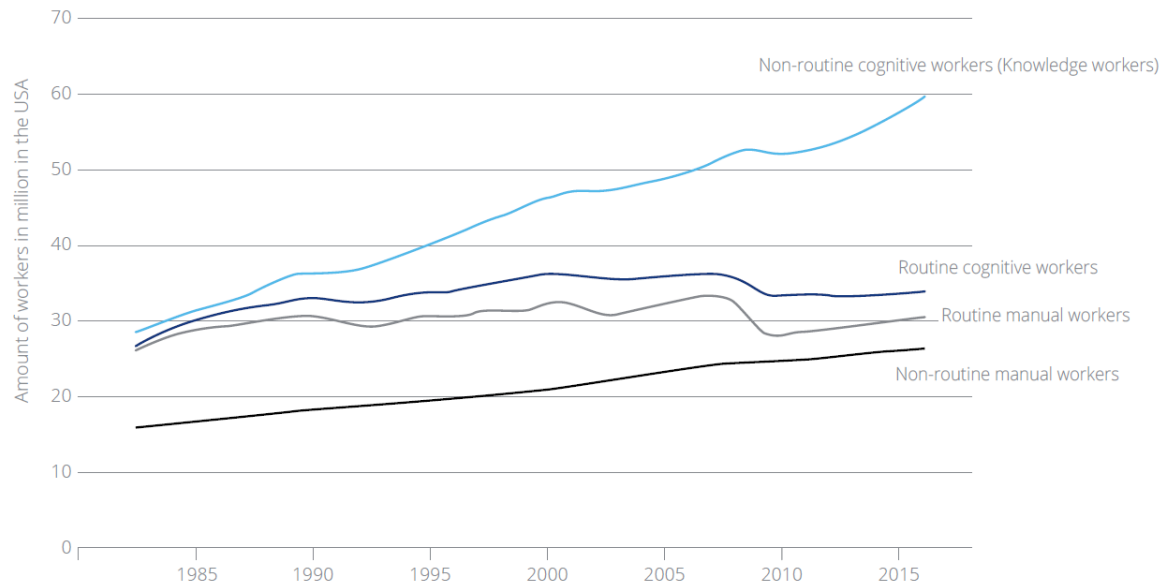
New generations are facing the challenge of entering 'a traditional labour market, so much so that the acronym NEETs ('not in education, employment, or training') has taken foothold' (Deloitte, 2017). Economic uncertainty, and the slowdown in global trade, will affect the work market. According to UN DESA (2019), 'the world will need to create 600 million new jobs – more than 200 million in sub-Saharan Africa alone – between now and 2030 just to maintain the current rate of unemployment'. This will result in nearly 1.8 billion people – one in three adults – having to 'face chronic employment risks, including unemployment, vulnerable employment or leav[ing] the work force altogether' (ibid.). The widespread vulnerability of jobs threatened by automation in emerging markets might lead to 'greater job displacement and income inequality' (EYQ, 2018). Urbanization also affects work patterns, with the possible emergence of a 'cluster of skill and advantage in some cities, while diluting skill and downscaling talent in others, as well as rural areas' (EU Commission, 2018). This reordering in different locations according to skills and talent 'could lead to a much greater urban/rural divide in future, as well as inequalities between cities' (ibid.).

Figure 8: Unemployment is higher in low-income countries



Source: EY calculations based on data from Oxford Economics, extracted from EY's Growing Beyond Borders tool. Graphics: EYQ (2018).

Figure 9: The rise of the knowledge worker



Note: Workers are classified by whether their occupation is primarily cognitive or manual work, and whether the tasks are routine. Knowledge work is non-routine cognitive work. Source: Dvorkin (2016). Graphics: Deloitte (2017, p. 53).

2.4 CRITICAL NOTES

While the literature on most of the megatrends has a negative outlook, this was less the case for Rapid Technological Development, which was generally presented more as a trade-off, with benefits for everyone after a long period. The environmental impact of ICT, such as the carbon emissions of data centres, tends to be disregarded, with a tendency in the sources to represent technology as a possible means of alleviating resource scarcity and climate change.

However, the literature considers issues related to the digital divide fairly well, i.e. who will or will not benefit from innovation. Profit comes from ownership of data and/or of the technological means of production, such as robots, hardware, software, and so on. If poverty is to be eliminated, the downsides of technological innovation and how to reach those who will otherwise inevitably be left behind must be considered (Pathways to Prosperity Commission, 2019). It is not just the lack of infrastructure, but of technological literacy that excludes many from benefiting from technology, particularly for those living in poverty. Furthermore, the digital divide is gendered: there are often multiple interacting economic, social and cultural obstacles that limit women's access to ICT and its benefits.

The internet has become the perfect environment for hate speech and non-physical abuse to thrive, and a hunting ground for abusers to lure in victims of physical abuse. Minorities in terms of race, gender, sexual orientation, religion, disability or ethnic origin are more exposed to online hate speech and cyberbullying (Llorent et al., 2016). An intersectional approach, looking at who is most abused online, is particularly needed when considering the dark sides of online interaction.

Automation and Robotization promise to ease up humans' workloads but might result in unemployment if educational systems are not put in place to help workers to adapt (the transformation of education is considered in **Chapter 3**). However, given that the profits of automation go to those who own the capital means, progress will increase inequality, at least in the short term. Also, automation is likely to be competitive with low wages in LICs, resulting in factories (now automated) moving back to HICs, while remote working might result in a global competition in the job market that could lead to a race to the bottom. This trend can already be

seen with call centres for services in HICs being relocated to countries with lower wages. While this means that customers can receive assistance at any time of the day, there tends to be less social protection afforded to such workers.

Other sides of technology are overlooked in the megatrend scans, including the major risk that technology is used for limiting people's freedom. This goes beyond the data privacy risk mentioned in most of the literature, as can be seen in China, where technology is used as a surveillance tool by the authoritarian regime (Mozur and Krolik, 2019), or in some conflict-afflicted regions, where refugee (non)registration can become a tool for oppression (cf Thomas 2018). This potential for oppression and control combined with the growing power held by social media and technology companies, has already reinforced state control and propaganda in many contexts (for more on social media and social cohesion see **Chapter 5**, Shifting Power). Whether it is the responsibility of a private company to limit and control access to technology to avoid mass manipulation and violence is becoming a question of great importance.

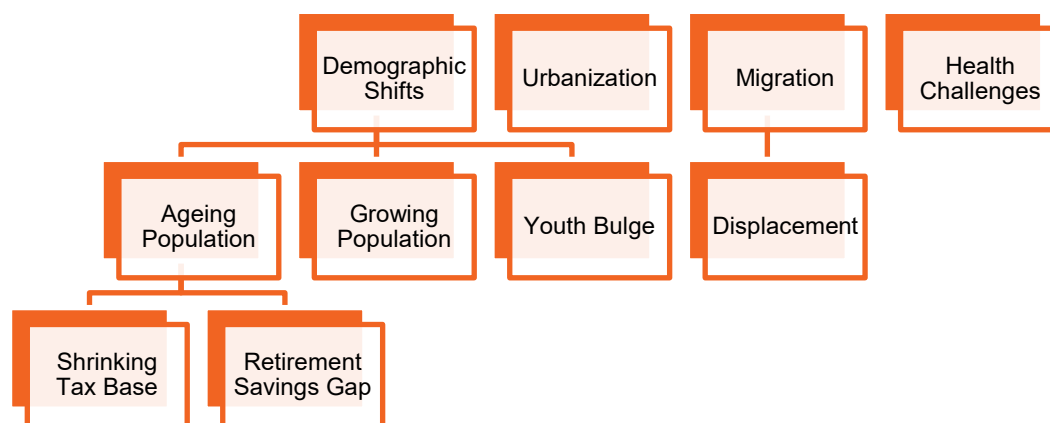
For the Changing Work megatrend, there are many mentions in the literature of an increase in female participation in the formal workforce. Many of the sources identify the positive economic outcomes that this might generate. However, it is not identified consistently as a trend, possibly due to the geographic variation of this trend (cf Ortiz-Ospina and Tzvetkova, 2017). The increasing participation of women in the workforce is primarily seen as a chance for economic growth, with societal benefits overlooked. We do not support a vision that values people only in terms of what those in paid jobs add to the economy in measurable terms while ignoring the economic and social benefits of unpaid and underpaid work, often seen as primary responsibility of women (Coffey et al., 2020).

3 DEMOGRAPHY

The Demography cluster (see **Figure 10**) encompasses the many changes in the composition of populations and how these are shaping societies. It includes the Demographic Shifts, Urbanization, Migration and Health Challenges megatrends and the sub-trends:

- Ageing Population;
- Growing Population;
- Youth Bulge; and
- Displacement.

Figure 10: Demography megatrends and sub-trends



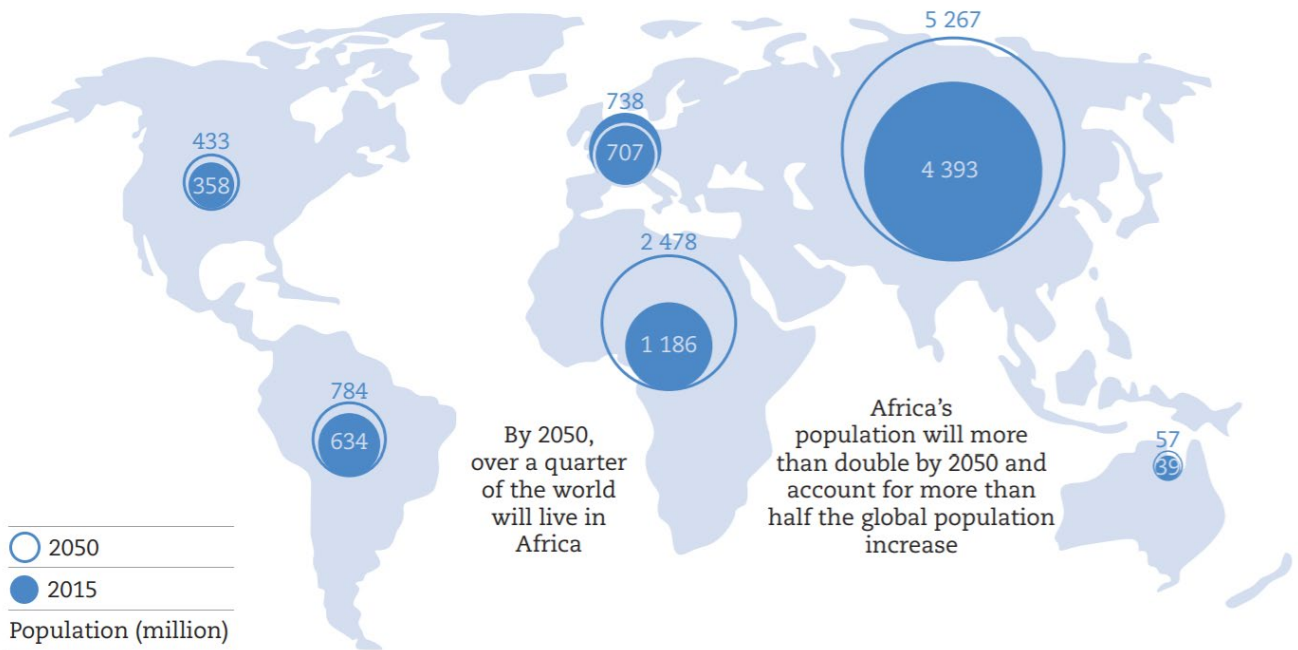
3.1 DEMOGRAPHIC SHIFTS

The transformation of the structure of populations, particularly age distribution.

Changes in the size and age of the population is the most mentioned megatrend in the Demography cluster. The global population is projected to keep increasing, reaching 9.7 billion by 2050 (OECD, 2016; see **Figure 11**). A growing population can be a positive stimulus for the global economy, with more innovators, consumers and researchers (EU Commission, 2018). Demographic shifts will always change the nature of work, with ‘new generations entering the workforce and older generations working longer’, transforming ‘career models and organisational structures’ (ibid.).

However, age distribution varies greatly by geography, with diverse consequences in different regions. Despite being a universal trend, ageing populations are particularly affecting high-income economies where, combined with low fertility, they are resulting in a shrinking population. In many parts of Asia and Africa, Ageing Population is overshadowed by the more dominant megatrend of the Youth Bulge. A youth bulge occurs when a country has successfully reduced infant mortality, but mothers still have a high fertility rate. This leads to a large share of the population being children and young adults, which is common in LICs (Yifu Lin, 2012). A youth bulge can mitigate the effects of an ageing population for a period (see **Figure 12** and **Figure 13**). In those regions facing very high population increases, combined with increasing Urbanization, serious challenges will arise around Resource Scarcity, including food availability and quality. These will in turn be aggravated by the effects of Climate Change.

Figure 11: Global population to reach 9.7 billion by 2050



Source and graphics: OECD (2016, p. 2)

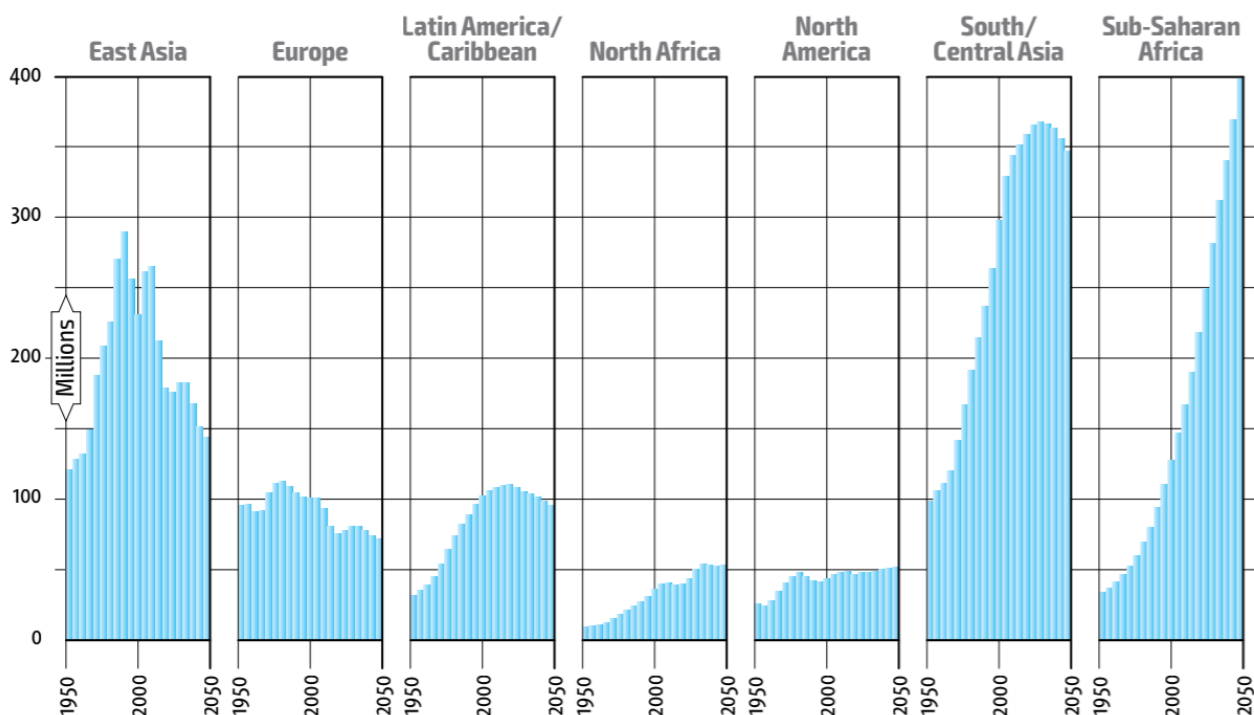
Figure 12: Percentage of populations under-25 by national income and region



Note: EY calculations based on data from Oxford Economics, extracted from EY's Growing Beyond Borders tool. Chart shows regions with the highest share of populations younger than 25.

Source and graphics: EYQ (2018)

Figure 13: Population estimates of people aged 15–24 by region, 1950–2050



Note: Each bar is an estimate or a projection of the number of 15–24 years olds for one year at five-year intervals.
Source: UN (2015), cited in FAO (2017). Graphics: FAO (2017, p. 96)

A growing proportion of the population, initially in HICs, will be older due to lower fertility rates and higher life expectancies. The sub-trend Ageing Population appears four times more often than Youth Bulge in the sources examined. This reflects either a stronger anticipated impact of ageing on the global population – as ageing is a given at a global scale – and/or bias of the sources that primarily consider forces affecting HICs. Rapidly ageing populations occur in all regions, with 1.4 billion people over 60-year olds in 2030 growing to 2.1 billion by 2050. In 2050, ‘all major areas of the world except Africa will have nearly a quarter or more of their populations aged 60 or over’ (Millington and Cleland, 2017).

The next 20 to 25 years may see further increases in old age dependency rates before they gradually level off. Over the next 15 years, the number of older persons is expected to grow fastest in Latin America and the Caribbean, with a projected 71 percent increase in the population aged 65 and above, followed by Asia (66 percent), Africa (64 percent), Oceania (47 percent), North America (41 percent) and Europe (23 percent).

FAO, 2017

Positive perspectives

The higher proportion of young people in LICs and MICs might help compensate for the growing elderly populations in due course. It might also increase the chances for them to achieve a new and more effective voice nationally and globally. A youth bulge can also have very positive effects for economies. A larger proportion of young people is, in economic terms, a ‘demographic dividend’; an expanding young workforce results in ‘more people who are both able to work and eager to consume’ (Sunter, 2013; UNFPA, 2014; cited in Retief et al., 2016). Of course, this is only possible when there are decent jobs.

Negative perspectives

Ageing societies will slow down economic growth and erode the welfare systems now in place. An 'unsustainable pace of life' has created 'the challenge of ensuring equity for our children... [where] social services are strapped as the elderly require more long-term care, the ratio of dependents to workers in a society rises, and retirement ages are pushed back' (Deloitte, 2017). In general, ageing populations are leading to a Shrinking Tax Base and workforce, both of which are needed to sustain the social and health spending that will increase as people get older (OECD, 2016), potentially overwhelming healthcare and pension systems (EYQ, 2018). When retired people outnumber the active workforce, ageing societies will incur a Retirement Savings Gap if they do not act. According to Sydney Business Insights (2019), 'for places like Europe this will mean we need to increase participation in the [formal] labour force from women and the elderly themselves, and possibly also increased reliance on immigration to sustain the workforce'.

If many young people fail to find incomes through employment, the Youth Bulge might become a demographic bomb (Yifu Lin, 2012). As described in **Chapter 2** on the Rapid Technological Development cluster, the job markets of emerging economies are particularly challenged by Automation. A mushrooming young population requires considerable resources to be prepared for an increasingly automated and precarious work market, with decent work far from guaranteed:

Preparing these young people to contribute economically means first providing quality education, access to healthcare and investment in the economy to generate productive employment. If these elements are not in place, demographic dividends can easily turn into demographic burdens in the form of mounting youth unemployment and underemployment with resultant social and political discontent.

Retief et al., 2016

3.2 URBANIZATION

The population shift from rural to urban areas, with an increasing share living in urban areas.

Migration to urban areas continues unabated. The proportion of people living in urban areas is expected to increase from 55% of the global population to 68% by 2050, when 2.5 billion people are predicted to live in cities (UN DESA, 2018; see **Figure 14**). The rate of urbanization is particularly significant in LICs and MICs, with 90% of the increase of urban residents taking place in Asia and Africa (ibid.).

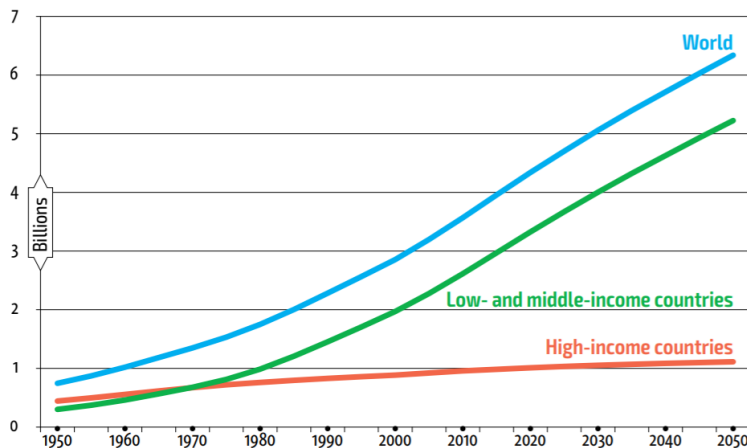
Of great significance is also the model of urbanization. 'Close to half of the world's urban dwellers reside in... settlements with fewer than 500,000 inhabitants', and 'by 2030 the world is projected to have 43 megacities with more than 10 million inhabitants', most of them in emerging economies (UN DESA, 2018). The growing importance of municipal authorities in megacities might exacerbate tensions between central governments and peripheral authorities, with rising calls for decentralization (see **Section 5.1** on Multipolarity). 'Megacities may become the epicentre of social, economic and political development, displacing national states in some instances' (OECD, 2016).

Positive perspectives

Increasing urban economies might offer opportunities for urban evolution in two ways:

1. Urbanization can be beneficial for economic growth. Cities account for 80% of global GDP, foster productivity thanks to agglomeration economies – able to reap the benefits of having firms located near one another in industrial clusters – and have higher employment and quality of life.
2. Urbanization can offer platforms for innovation by using ICT for efficient infrastructure and lower the cost of services (Dugarova and Gülasan, 2017).

Figure 14: Urbanization rates predicted to grow much faster in LICs and MICs



Source and graphics: FAO (2017, p. 15)

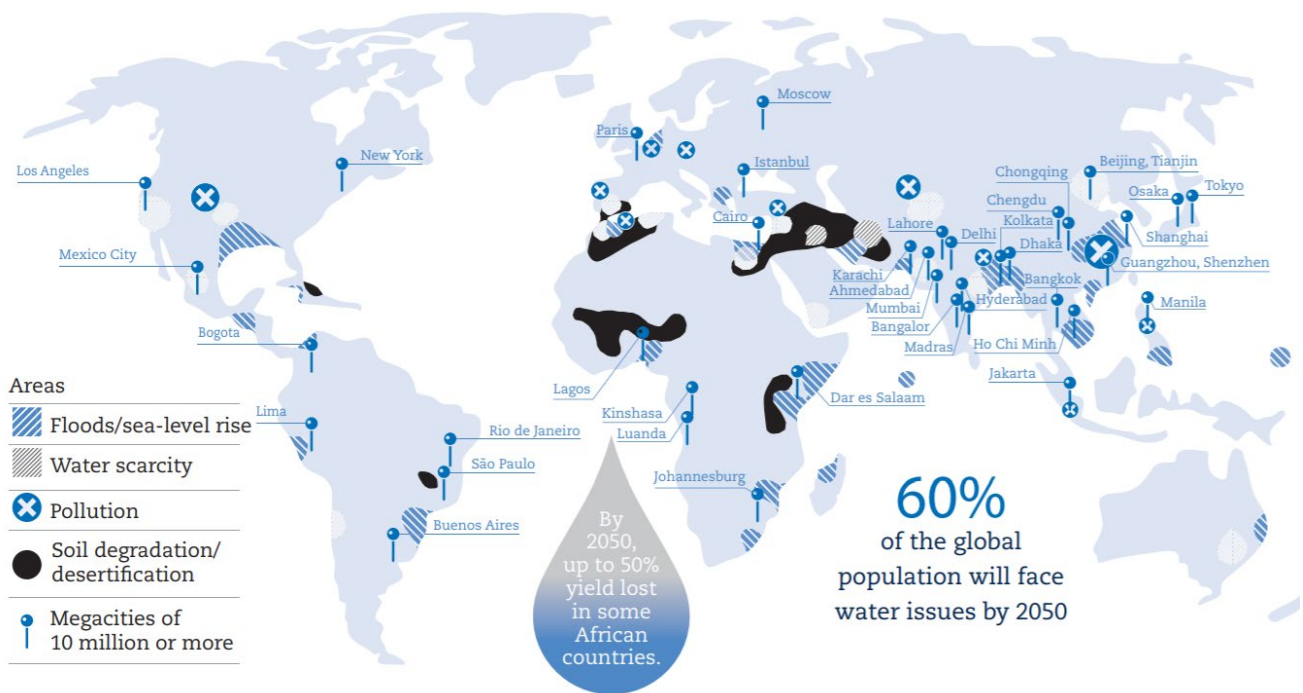
Negative perspectives

Growing urban populations will be challenging for LICs and HICs alike. Urbanization will put more pressure on local governments, as people demand better infrastructure and services. In LICs, 'rapid urbanization is often unmanaged resulting in burgeoning urban sprawl', while HICs are challenged by the task of renovating their ageing infrastructure, 'a task whose accomplishment will function as an acid test for many towns and cities' (Z_punkt, 2019).

Particularly in LICs and MICs, rapid urbanization can result in inequality and exclusion by increasing 'unemployment, social tensions and disparities, and health issues associated with pollution', and if urbanization is faster than the ability to develop housing and infrastructure, it will further increase the number of slum-dwellers (Dugarova and Gülasan, 2017). According to UN DESA (2015, cited in Dugarova and Gülasan, 2017), 'in 2014, more than half of urban dwellers lived in slum conditions in 41 countries, of which 83 percent are projected to see the urban population grow by at least 50 percent over the next 15 years'.

Urban populations are more vulnerable to pandemics, disasters and the effects of climate change, particularly in poorer and peripheral areas of cities, like slums or shantytowns (Ferris, 2011; **Figure 15**).

Figure 15: Areas of floods, water stress, pollution and droughts today, and locations of megacities in 2030, according to OECD



Source and graphics: OECD (2016, p. 4)

3.3 MIGRATION

The temporary or permanent movement of people to a new location, both internally – in the same country – and externally – to a different country.

Migration results from a combination of factors, including the megatrends Demographic Shifts, Conflict, Climate Change and Resource Scarcity. Migrants are often compelled to move because of socioeconomic factors including poverty, inequality and job insecurity: in rural areas, work is affected by 'low and insecure incomes, poor occupational safety and health conditions, gender inequality in pay and opportunities, and limited access to social protection' (FAO, 2017). Where countries experience a youth bulge along with adverse factors such as water scarcity and climate-related disasters, young people in poor areas are left without other options. Thus, a lack of prospects and job opportunities, particularly for young people in LICs and MICs, results in both Migration and Urbanization.

When the lack of opportunity is aggravated by conflicts or the scarcity of food and water – which is worsening due to the effects of climate change – it results in forced migration, or Displacement. According to Deloitte (2017), 'as international wars and political conflict dominate the scene in many developing countries, resource fighting has led to the displacement of millions of residents'. Forced migration is also exacerbated by the 'climate–conflict nexus', i.e. 'the intersection between weak institutions, pre-existing social fragility and climate change vulnerability' (OCHA, 2016, cited in FAO, 2017). Displacement resulting from climate change has wide estimates: the number of internal and external migrants by 2050 could be between 25 million and 1 billion (EU Commission, 2018). One of the challenges for NGOs, governments and businesses, apart from mitigating these causes of forced migration, is to 'design systems for transience that help create resilient, local communities' (Forum for the Future, 2019).

Positive perspectives

The literature considers Migration to be usually beneficial both socially and economically. When paired with Automation, it could compensate for the loss of workforce and production due to ageing populations (EU Commission, 2018).

Migration flows may continue to account for a large proportion of developed countries' population growth. By 2030, 85% of population growth in the G7 economies could be from net migration, which could be beneficial to these economies.

Sydney Business Insight, 2019

Negative perspectives

The negative sides of migration identified in the literature reveal a tendency of the sources to concentrate their attention on OECD countries. It warns that migration could 'lead to increased social and political tensions (as indicated by the UK vote to leave the EU in June 2016, where migration was one of the key issues in the debate)' (Sydney Business Insight, 2019). The focus on immigration in the political discourse of many HICs indicates that fears are growing regarding the sustainability of current levels of migration, often resulting in 'public anxiety, political disputes and increasing security measures, with effect on civil liberties and freedom of movement' (EU Commission, 2018; see **Figure 16**). However, an increase in immigration does not always result in anti-immigration sentiment (ibid.). The Migration Policy Institute (2016, cited in EU Commission, 2018) identified five conditions for societal anxiety to appear:

- '1. Sudden flows of immigrants that are perceived as destabilizing.*
- 2. Perception of immigrants as competitors for resources, especially in areas of economic hardship.*
- 3. View of culturally distinct immigrants as a threat to the mainstream norms and values.*
- 4. Association between migration and acts of terrorism and crime.*
- 5. Loss of trust in the ability of policy-makers to control inflows of immigrants and manage successful integration.'*

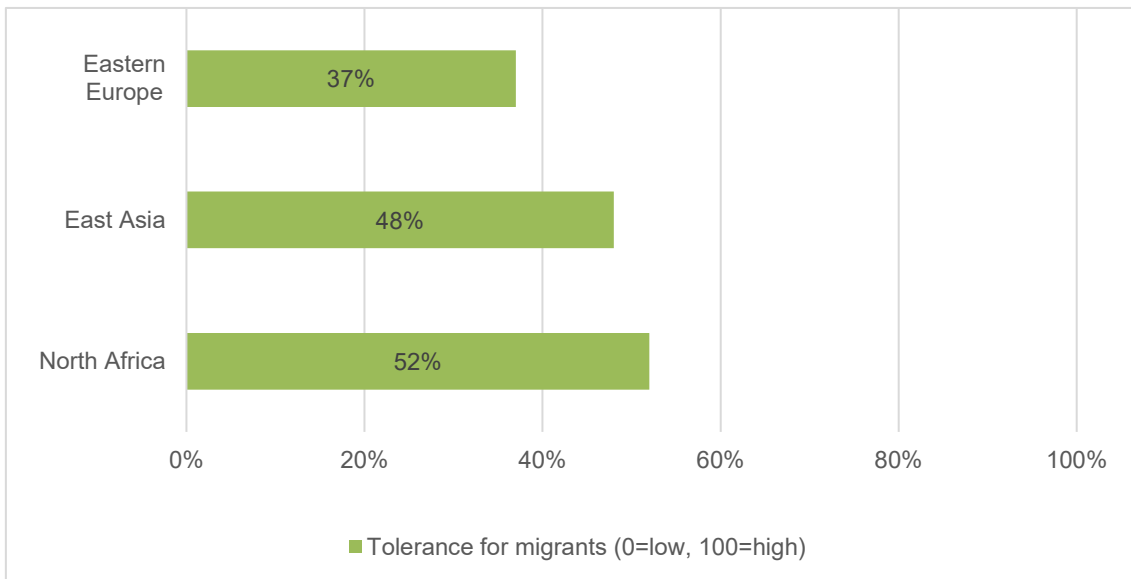
According to UN DESA (2019), populist fears and backlash against immigration undermine international commitments to 'safe, regular and orderly migration', thus creating a vicious cycle in which the causes of migration are not multilaterally addressed – and instead nativist policies are promulgated, including a retrenchment of developing funding – because of fear of migration itself (**Figure 17**). With regards to the growing populism in high-income countries,

...many developing countries with limited economic means are increasingly hosting large numbers of migrants and refugees. Jordan, Lebanon and Turkey are home to many Syrian refugees, while Bangladesh has taken over a million Rohingya refugees from Myanmar. In Africa, Uganda has sheltered the largest number of refugees on the continent. In Latin America, Colombia, Peru and Brazil are hosting many displaced people from the Bolivarian Republic of Venezuela.

UN DESA, 2019

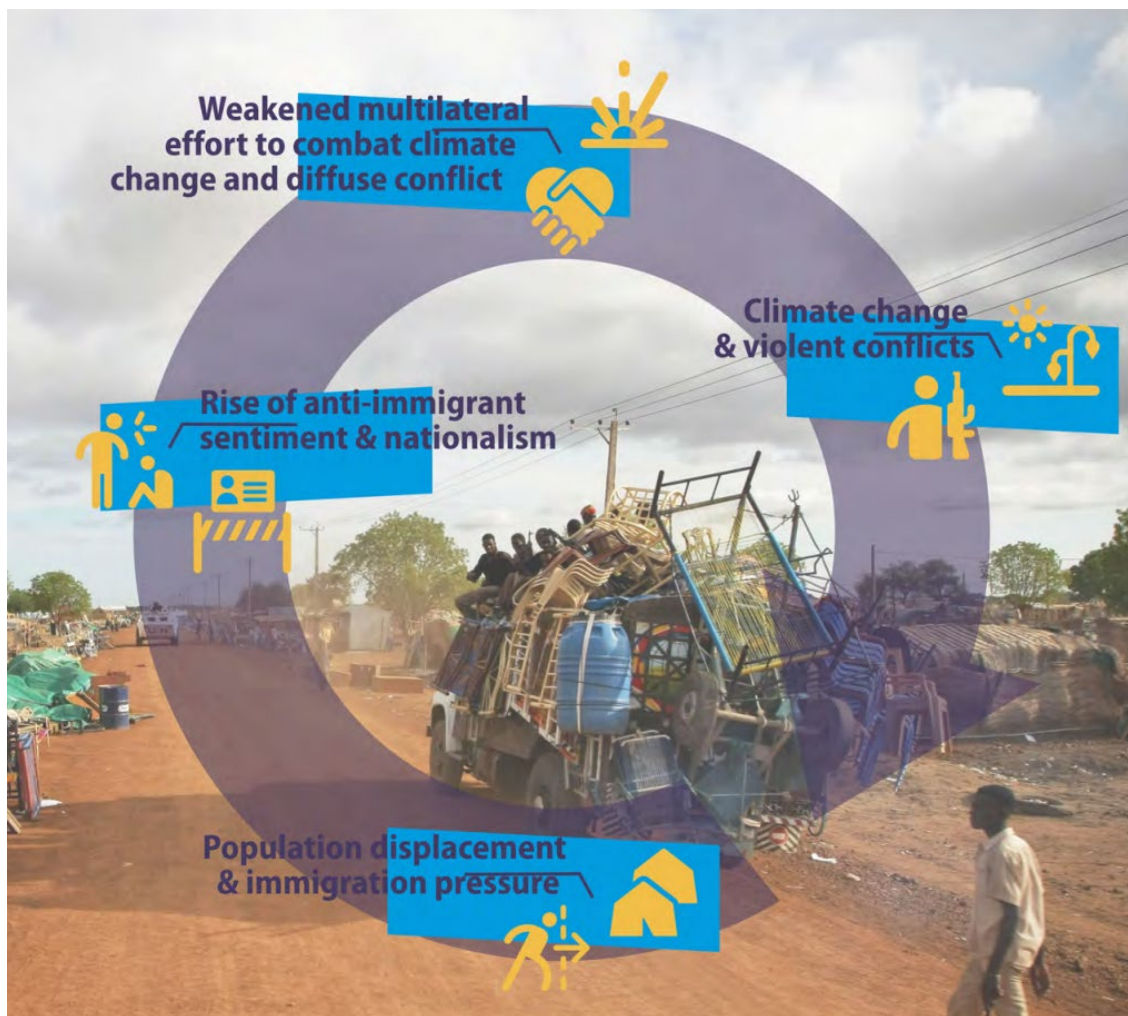
For migration to mitigate the impact of an ageing population and enrich a shrinking workforce, 'policies to integrate migrants should be adapted to the profile of regions and of local migrant communities and have to involve a wide range of local stakeholders, including businesses and non-governmental organizations' (OECD, 2019).

Figure 16: Regions with the lowest tolerance towards immigrants



Source: EY calculations based on data from 2017 Social Progress Index, extracted from EY’s Growing Beyond Borders tool. Chart shows regions with lowest scores for tolerance toward immigrants.

Figure 17: Vicious cycle of migration



Source and graphics: UN DESA (2019, p. 11)

3.4 HEALTH CHALLENGES

Opportunities and challenges in improving and maintaining global health.

The Health Challenges megatrend is included in the Demography cluster due to its close connection with Demographic Shifts (particularly Ageing Population) and Urbanization. However, this megatrend is driven by many other causes including environmental changes caused by Climate Change, overuse of antibiotics and eating habits.

Positive perspectives

Since 2000, health has improved worldwide consistently, with falling incidence rates of HIV (42% decrease of AIDS-related deaths; 35% decrease in new HIV infections), tuberculosis (40% decrease in prevalence rate; 29% decrease in deaths), malaria (60% decrease in deaths) and other infectious diseases (Dugarova and Gülasan, 2017). These achievements are attributable to political commitment, strong global partnerships, substantial increases in funding, expansion of interventions and better monitoring and use of data (ibid.). Such improvements are likely to continue.

Improvements in global health in the last decades are also attributable to major technological advancements and trends, such as 'assistive medical technologies; genetic engineering; highly specific drugs; molecular diagnostics and therapy tools with individualized approach at the cellular level... [an] individual approach to human neurophysiology; RNA aptamers, microchips under the skin and pocket biosensors' (EU Commission, 2018). The technologies might fundamentally change the healthcare paradigm towards one that is 'predictive, personalized, proactive and participatory' (EYQ, 2018). This includes advanced methods in preventive diagnostics and remote healthcare – whereby patients measure their own health data and transfer it to doctors, such that technology transfers the 'do-it-yourself principle to the health sector' (Trend One, 2019). As half of the global population still lacks access to essential health services, mobile solutions might help expand coverage that could compensate for shortfalls in health workers, especially in remote locations (UN DESA, 2019).

Negative perspectives

Three health challenges are expected to affect the world in the coming years:

1. the spread of infectious diseases or pandemics;
2. the results of a malnourished, overweight or obese population; and
3. the resulting rise in healthcare spending.

The risk of spreading infectious diseases or pandemics are exacerbated by global trends such as 'population growth, increased international movement of people and goods, climate change, urbanization and poverty' (Dugarova and Gülasan, 2017). While growing populations and urbanization mean people are living more densely, the increasing movement of people and goods could facilitate faster transmission of diseases across long distances. It is estimated that climate change will cause 'approximately 250,000 additional deaths per year between 2030 and 2050 due to heat stress, diarrhoea, malaria, and childhood undernutrition' (EU Commission, 2018).

The overuse of antibiotics is another worrying trend: the ability to treat epidemics might be threatened by rapidly increasing antimicrobial resistance (AMR) (Dugarova and Gülasan, 2017). Most (up to 70%) of the antibiotics given to animals are 'often for no other reason than to make them grow more quickly' (EU Commission, 2018). Unless there are changes in how antibiotics

are used – or new classes are found – ‘the global annual death toll due to AMR could grow from today's estimated 700,000 people (one person a minute) to 10 million a year by 2050’ (ibid.).

The second global health challenge is related to food and its supply. The main factors threatening food security are:

- transboundary pests and diseases (FAO, 2017);
- climate change (Dugarova and Gülasan, 2017); and
- pollution, especially rising CO2 levels, which threaten the plants that are protein sources for 76% of the global population (EU Commission, 2018).

It is estimated that ‘some 815 million people suffered of hunger in 2016 (11% of the global population) – an increase of 38 million compared to 2015’ (EU Commission, 2018). Malnutrition also affects MICs and HICs, where nutrient deficiency and obesity are alarmingly high: according to the EU Commission (2018), ‘over 2 billion people suffer from micronutrient deficiencies, while 1.9 billion adults and 41 million children are overweight’, with an estimate that over 50% of the global population will be affected by malnutrition by 2030 ‘unless urgent action is taken to improve access to high-quality food’. Diet patterns, particularly the ‘modern western diet’, are responsible for obesity and related problems such as heart disease, cancer and diabetes (EYQ, 2018).

The third health challenge is increasing healthcare spending, given a growing and ageing population. Healthcare systems are particularly stressed by the increase in population density (BlackRock, 2018) and ‘health issues associated with pollution’, especially in LICs and MICs (Dugarova and Gülasan, 2017), while an ageing population ‘increases the need for medical technology’ (Smiths Group plc, 2018).

3.5 CRITICAL NOTES

Most of the literature describes the Youth Bulge, when compounded by rising automation and inequality, as a ‘demographic bomb’. The theory is that if a large young population (which could potentially become a positive demographic dividend) cannot gain a satisfactory income, they might become a ‘large mass of frustrated youth... likely to become a potential source of social and political instability’ (Yifu Lin, 2012). We think this is a one-sided, negative perspective of a situation that might actually offer opportunities for social movements and young actors to bring about positive change.

As for many trends in other clusters, the literature lacks a gendered approach to the trends categorized under Demography. A gendered approach to migration, for example, is fundamental to understand the reasons behind, and the social and geographical characteristics of, migration. Gender norms often preclude access to economic means and social services, while it might expose individuals to discriminatory practices (IOM, 2019).

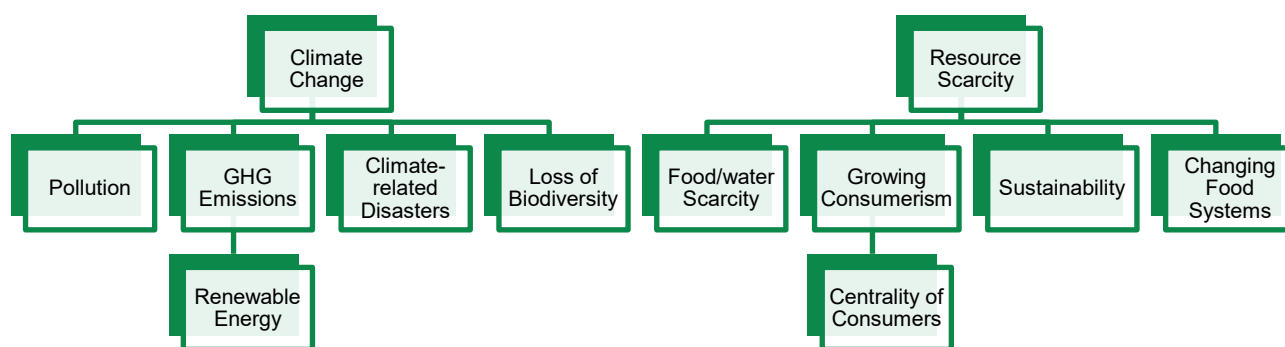
The literature reflects a Eurocentric account of migration trends. This fails to account for the massive regional immigration in LICs and MICs, given that 85% of the world’s refugees are hosted in developing countries (UNHCR, 2017).

4 ENVIRONMENTAL PRESSURES

The Environmental Pressures cluster (see **Figure 18**) contains all the trends discussed in the sources about humans' interactions with the natural environment and their consequences. It includes two megatrends, Climate Change and Resource Scarcity, and the sub-trends:

- Pollution;
- Greenhouse Gases (GHG) Emissions;
- Climate-related Disasters;
- Loss of Biodiversity;
- Food/Water Scarcity;
- Growing Consumerism;
- Sustainability; and
- Changing Food Systems.

Figure 18: Environmental Pressures megatrends and sub-trends



4.1 CLIMATE CHANGE

A change in global or regional climate patterns largely attributed to the increased levels of atmospheric carbon dioxide primarily produced by the use of fossil fuels.

Climate change results from the increase in global temperatures primarily caused by 'the human practice of burning fossil fuels' (BlackRock, 2018). The GHG emissions that trigger climate change are generated mainly in 'power stations, industrial plants, traffic systems and agriculture' (Z_punkt, 2019). Global warming affects surface and water temperatures (see **Figure 21**), resulting in melting polar caps and rising sea levels (ibid.). Climate change increases the incidence of climate-related disasters and extreme weather events (see

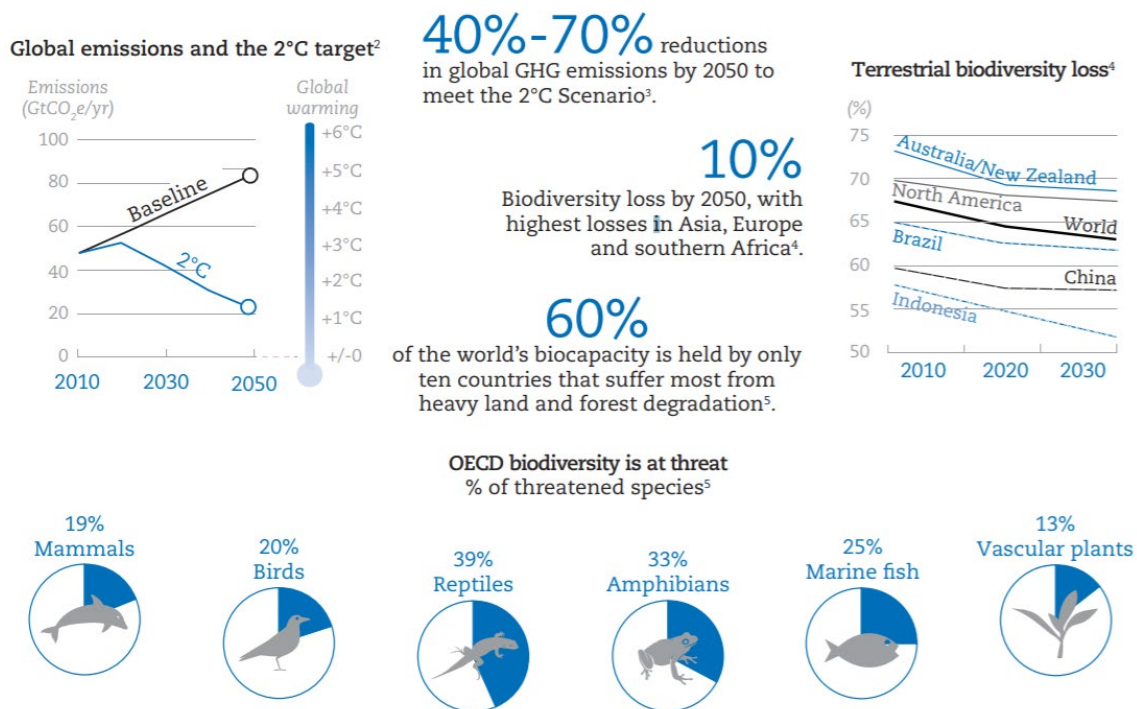
Figure 20), worsening the megatrend of Resource Scarcity, putting pressure on ecosystems and furthering the loss of biodiversity (see **Figure 20**).

Climate change is a threat that calls for a radical and rapid change in the high carbon-consuming lifestyles prevalent in HICs to avoid irreparable damage to the environment. The Intergovernmental Panel on Climate Change ‘recently warned that we have 12 years to avert catastrophic climate change, and the consensus is that we’re already locked into 1.5°C of warming – not climate change but climate breakdown’ (Forum for the Future, 2019; see **Figure 21**).

HICs are primarily responsible for GHG emissions, with per capita emissions ‘43 times higher than... in low-income countries’ (UN DESA, 2019). Nonetheless, China is now the largest national emitter in absolute terms (The Economist, 2019b), and all MICs and fast-growing economies have an increasing share of responsibility (see **Figure 22**) as their per capita emissions grow with prosperity. According to the literature, and notwithstanding the primary responsibility of HICs for global emissions, the need for dramatic changes in production and consumption means that technology transfer is essential, especially in renewable energies, to help decarbonize economic growth (OECD, 2016; UN DESA, 2019).

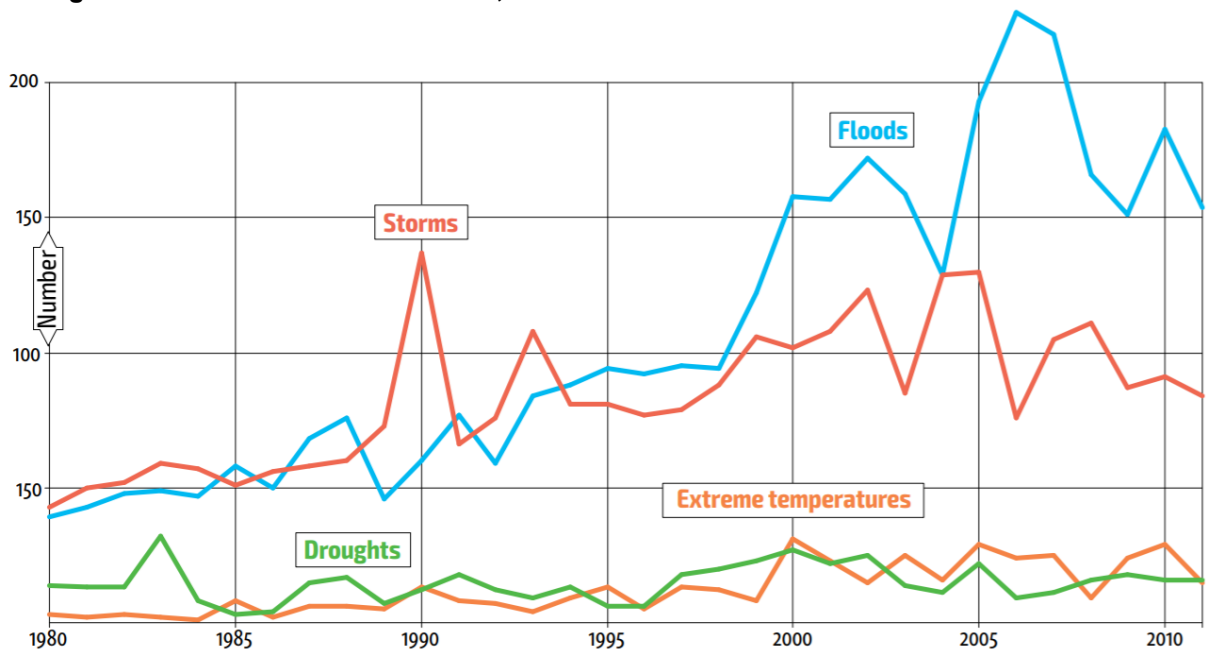
Growing economies are also the most endangered by climate change, ‘particularly small island developing States and the least developed countries that are least able to cope’ (UN DESA, 2019). Some pin their hopes on technological innovation to reduce GHG emissions and increase access to electricity through ‘decentralized, off-grid renewable energy systems that use solar photovoltaic, wind turbines, mini-scale hydropower generators or biomass’ (ibid.).

Figure 19: Biodiversity loss



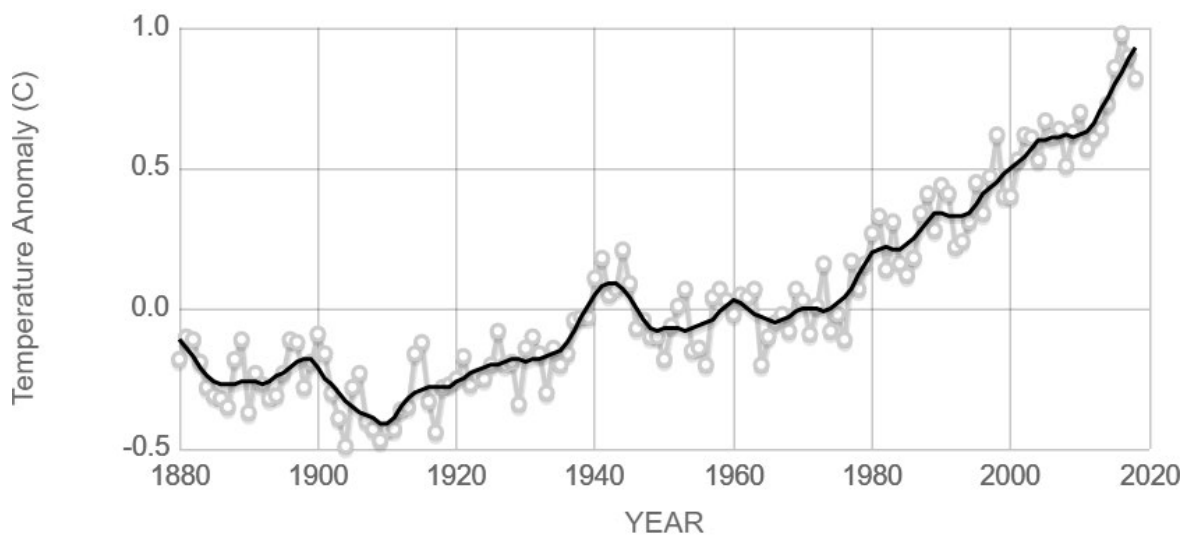
Source and graphics: OECD (2016, p. 6).

Figure 20: Climate-related disasters, 1980–2011



Source: UNISDR (2016), cited in FAO (2017). Graphics: FAO (2017, p. 66).

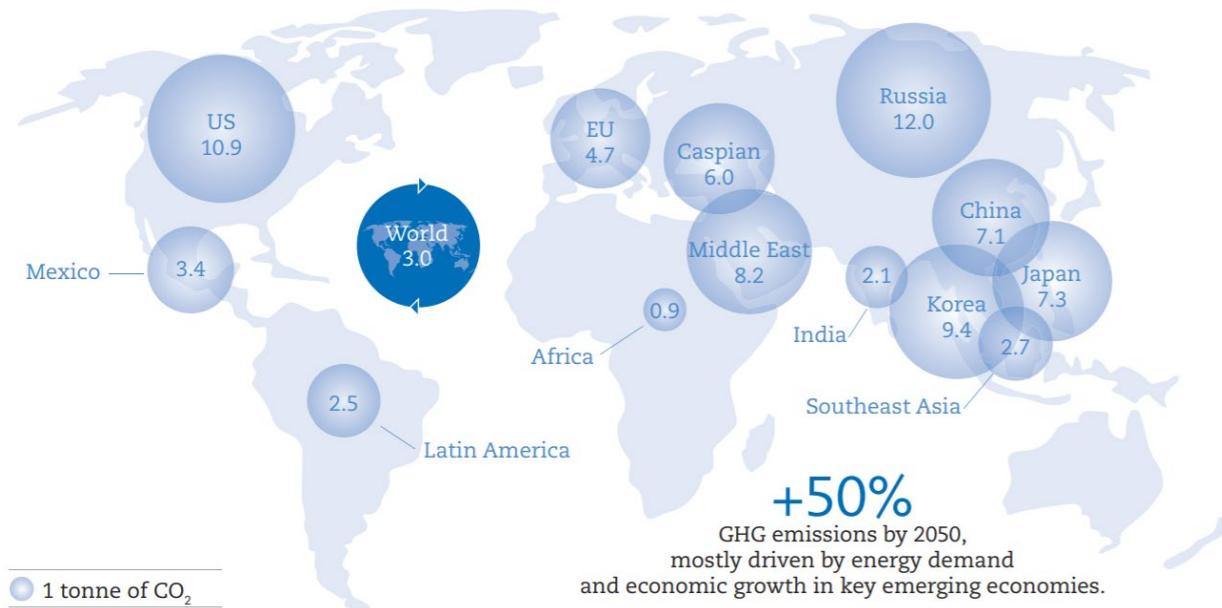
Figure 21: Global temperatures of land and ocean are rising



Note: Global Land-Ocean Temperature Index: This graph illustrates the change in global surface temperature relative to 1951-1980 average temperatures. Comparing Annual mean (dots) and Lowess smoothing (black line).

Source and graphics: NASA Goddard Institute for Space Studies (2019).

Figure 22: Energy-related CO2 emissions per capita, 2030



Note: CO2 emissions account for 75% of global GHG emissions, with most coming from energy production. Source and Graphics: OECD (2016, p. 6).

Evidence suggests that 'increased urbanization contributes to increasing climate change' (Retief et al., 2016), with urban areas thought to be the most affected by disasters caused by climate change:

Almost all (95%) of cities facing extreme climate risks are in Africa or Asia, a report by risk analysts Verisk Maplecroft has found. And it's the faster-growing cities that are most at risk, including megacities like Lagos in Nigeria and Kinshasa in the Democratic Republic of Congo. Some 84 of the world's 100 fastest-growing cities face "extreme" risks from rising temperatures and extreme weather brought on by climate change.

BBC, 2019

Climate-related disasters

Climate-related disasters, droughts and chronic crop failures lead to food and water shortages that cause impoverishment and migration. International NGOs, acting jointly with governments and businesses, can have a role in designing 'systems for transience that help create resilient, local communities' (Forum for the Future, 2019).

Climate change can hamper development results and development choices can also change the earth's climate... The fragmented nature of the global climate finance landscape increases the challenges associated with accessing finance and reduces overall efficiencies.

Sachs and Schmidt-Traub, 2013, cited in Pano, 2019

Climate change can also affect economic stability, particularly for people living in poverty, as they have 'lower quality assets and less access to protection mechanisms and are more vulnerable to the negative effects of climate change on agricultural productivity, food prices, weather shocks and diseases' (Dugarova and Gülasan, 2017).

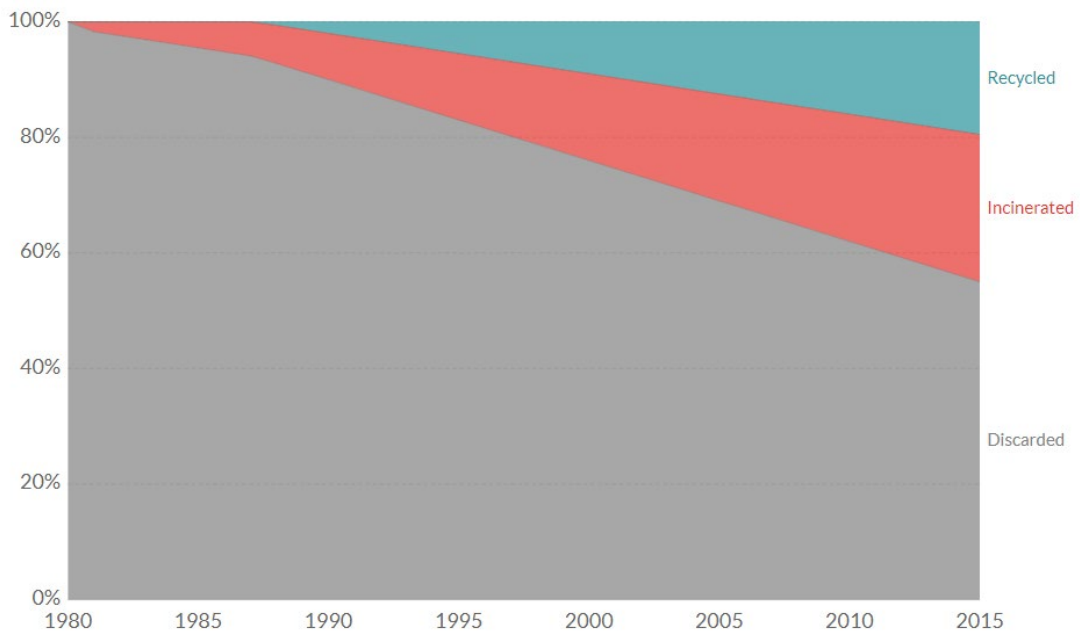
Pollution

Pollution is mentioned in the literature less than climate change, and is often linked to it. One prevalent standalone topic is plastic pollution, which contaminates resource systems, threatens

biodiversity and harms human health: 'the stats are mind-boggling: we know how much plastics enters the ocean every year (eight million tons), how little plastic packaging we recycle globally (around 14%) [see **Figure 23**], and the amount of the world's drinking water containing plastic fibre (83%)' (Forum for the Future, 2019).

Ritchie and Roser (2018) have calculated how much plastic has been produced and whether it was processed, recycled or discarded from 1950 to 2015. Of the 8.3bn tonnes of polymers, synthetic fibres and additives produced over that period, 55% went straight to landfill or was discarded, highlighting the problem of single-use plastic (see **Figure 24**).

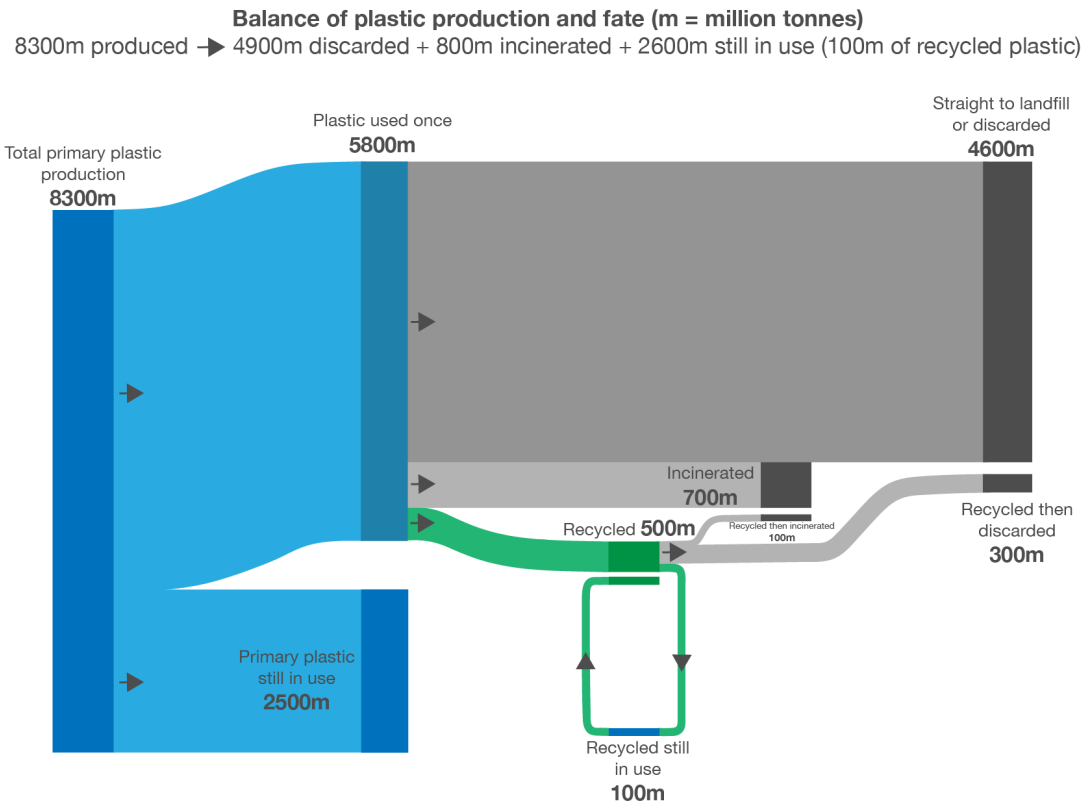
Figure 23: Global plastic waste by disposal



Note: Estimated share of global plastic waste by disposal method.

Source: Geyer et al. (2017), cited in Ritchie and Roser (2018). Graphics: Ritchie and Roser (2018).

Figure 24: Global plastic production and its fate (1950–2015)



Note: Global production of polymer resins, synthetic fibres and additives, and its journey through to its ultimate fate (still in use, recycled, incinerated or discarded).

Source: adapted from Geyer et al. (2017), cited in Ritchie and Roser (2018). Graphics: Ritchie and Roser (2018).

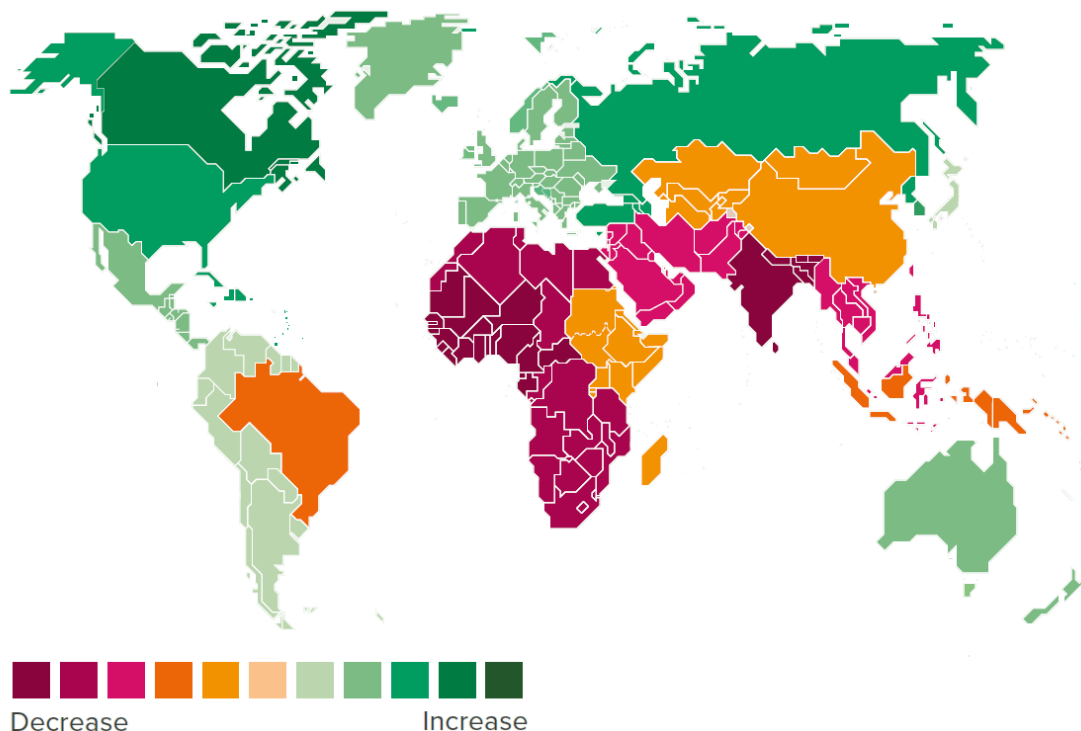
4.2 RESOURCE SCARCITY

A decline in the availability of natural resources that causes a decline in economic and social well-being.

The FAO (2017) reports how ‘a meta-analysis of 1090 studies on yields (primarily wheat, maize, rice and soybeans) under different climate change conditions indicates that climate change may significantly reduce yields in the long run’ (see **Figure 25** and **Figure 26**). However, although Climate Change can act as a multiplier of other trends, the origin of Resource Scarcity is the rise of resource consumption and depletion. The pressure and demands of growing populations are stressing finite resources, including fossil fuels and minerals, and resulting in a loss of biodiversity (see **Figure 27**).

According to Deloitte (2017), ‘unbridled growth over the past several decades has placed a high toll on our resources and capacity’, making it necessary to establish a ‘more efficient and quality-oriented means of production in order to sustain current levels of consumption’. Other sources recognize that the current models of production and consumption are pushing beyond planetary limits and that significant global action is needed to avoid irreversible changes to climate (PWC, 2019; Forum for the Future, 2019; **Figure 28**). Resource scarcity has reinvigorated the international discussion on environmental sustainability and citizen voices calling for radical change to current models of consumption and economic growth, for example through the climate strikes and the Extinction Rebellion movement. The recognition of planetary boundaries marks a shift from an open to a closed system perspective. The unquestioned pursuit of economic growth is increasingly recognized as problematic given the finite resource base on which economies rely (cf Raworth, 2017).

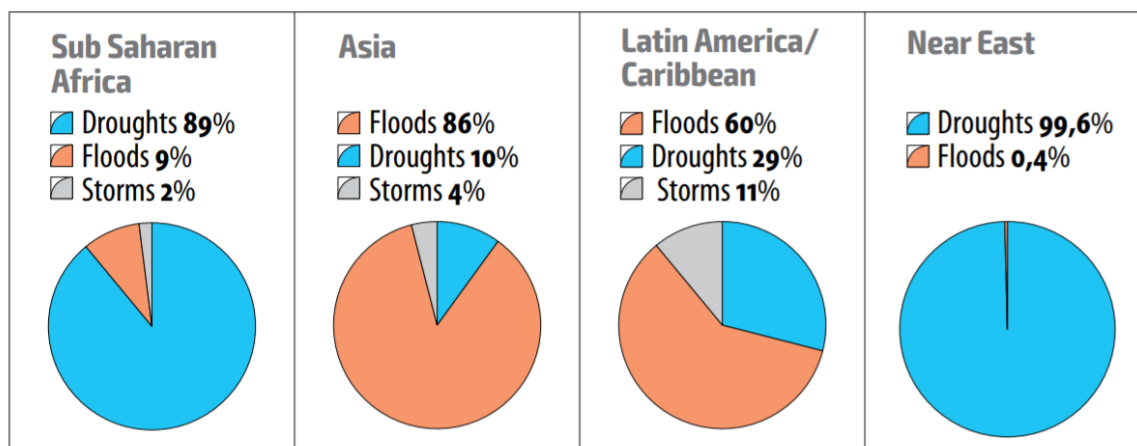
Figure 25: Changes in agricultural production in 2050



Note: the map shows changes in agricultural production with climate change relative to baseline scenario.

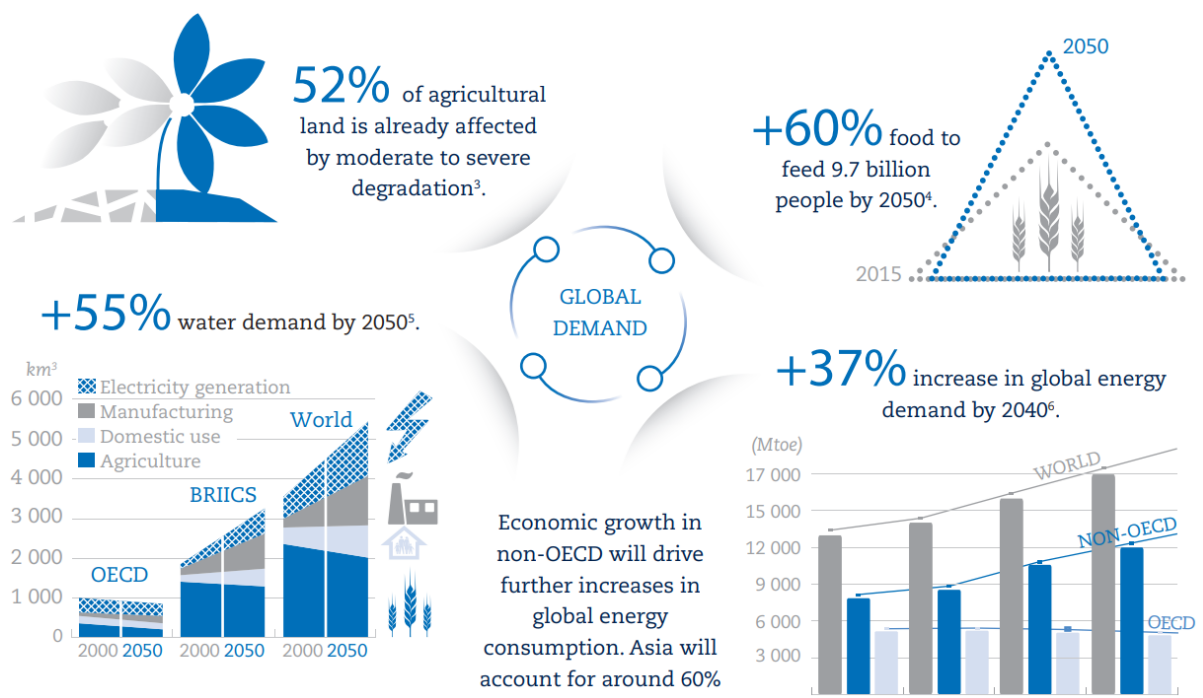
Source: FAO (2018a; 2018b). Graphics: Woodhill et al. (2020, p. 19).

Figure 26: Agricultural production losses after medium- and large-scale disasters in developing countries, by cause and region, 2003–13



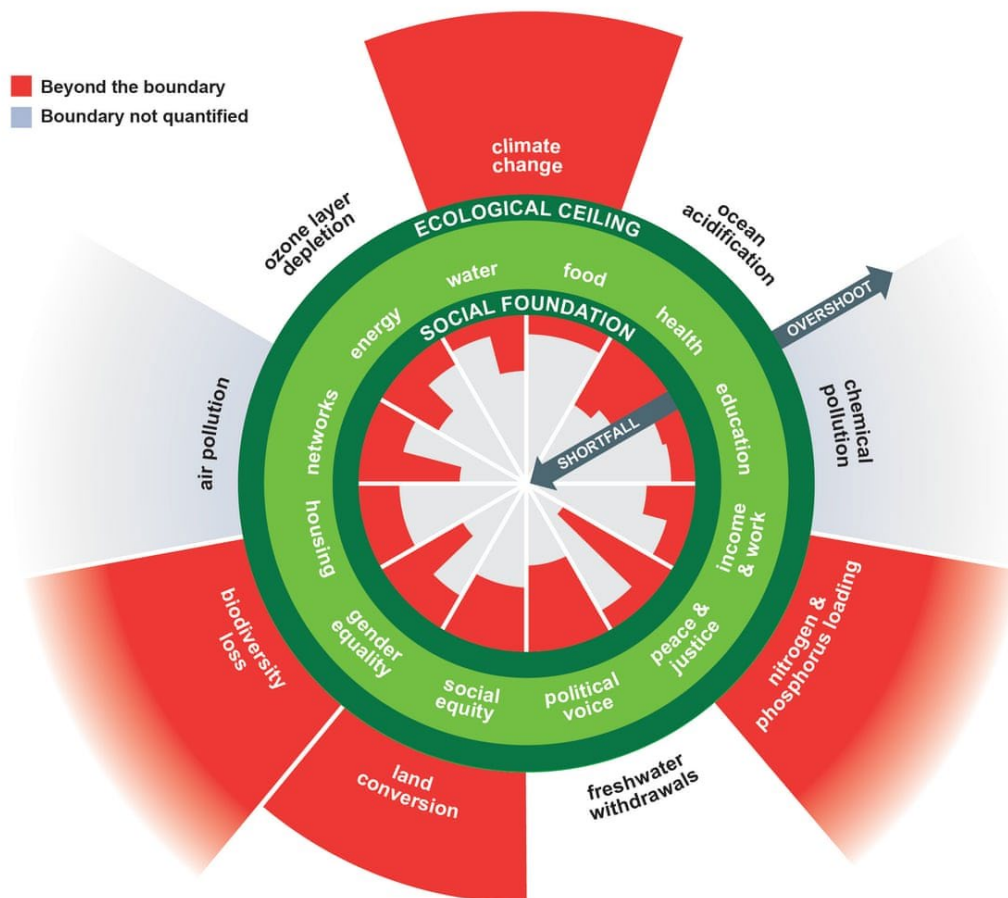
Source: FAO (2015), cited in FAO, (2017). Graphics: FAO (2017, p. 67).

Figure 27: Growing tension on water-food-land resources



Source and graphics: OECD (2016, p. 4).

Figure 28: The contemporary economic model exceeds the planetary boundaries



Source and graphics: Raworth (2017, p. 51).

Positive perspectives

Resource Scarcity is not discussed as a positive phenomenon in any of the sources. However, some are optimistic that technological development could help mitigate resource scarcity problems, with beneficial effects on pollution and climate change, by changing the monitoring, management, creation, consumption and disposal of resources. Progress in energy storage and water management, with the possible use of IoT for managing these storing technologies, might mitigate the problem (OECD, 2016), though these ideas are contested (Carton, 2019).

One source points to growing interest in environmental sustainability, 'resulting in the rise of new markets, an active lobbyist and political base, and renewed efforts in social sustainability' (Deloitte, 2017). The recent Extinction Rebellion protests in HICs is a recent example of strong citizen action.

An important sub-trend is Food/Water Scarcity (see **Figure 27** and **Figure 31**). Technology could help to ensure that there is sufficient food for all, by stimulating agricultural productivity and innovation (FAO, 2017). Moreover, consumer preferences have been changing, especially in HICs, with greater ethical concerns about how food is produced. For example, lab meat may be able to reduce the pollution caused by the meat industry, which has been growing to feed increasing numbers of an increasingly wealthy population.

The global food industry is experiencing a profound disruption. More consumers prefer eating 'clean foods' that are healthier and more environmentally sustainable. And technological innovations in food production are enabling a new meat mix that will change how people around the world consume protein.

Laudicina et al., 2018

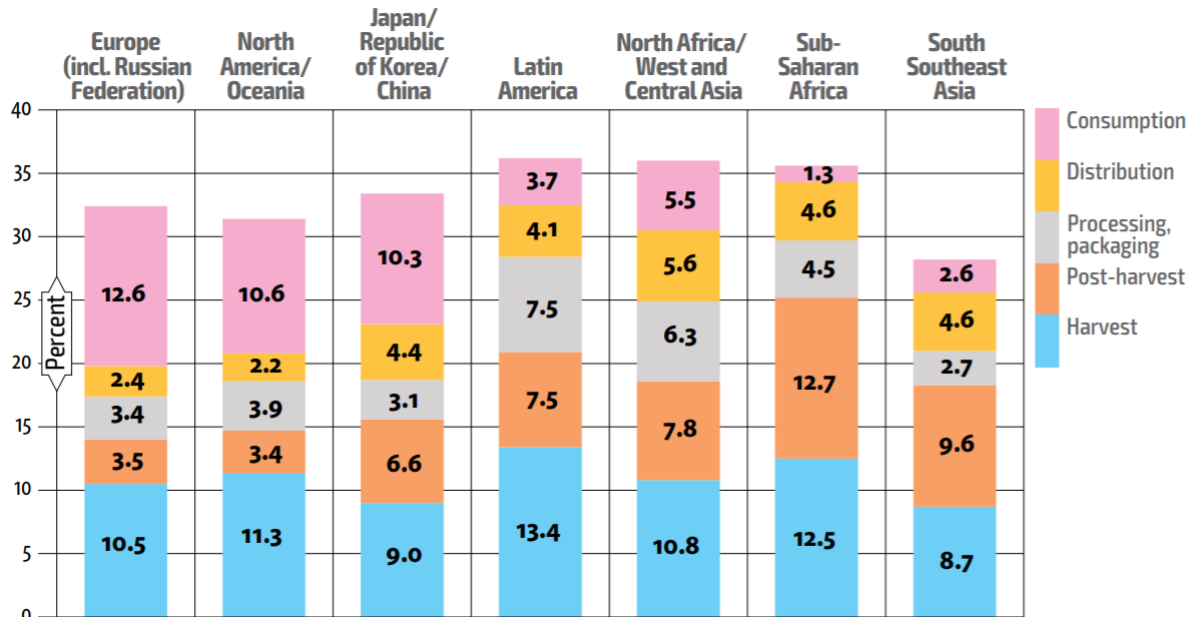
Another food-related field in which improvement is possible, though not yet noted as a strong future trend, is reducing food waste, as 'roughly one third of the food produced in the world for human consumption every year – approximately 1.3 billion tonnes – gets lost or wasted' (FAO, 2019; see **Figure 29** Error! Reference source not found.).

Negative perspectives

The implications of resource scarcity are manifold, with growing global competition for resources linked to conflict (see **Section 5.4**) (EEA, 2018; FAO, 2017). According to Deloitte (2017), today's territorial disputes are marked by 'significant environmental undertones'. In the future, changing consumption of food and water might result in greater domestic and international political tensions, as more regulation will be needed to address environmental change, including taxation and other (dis)incentives. Resource scarcity will 'likely result in "Super cycles" of rising and volatile commodity prices' (Retief et al., 2016), with future food prices skyrocketing and the challenge of water scarcity putting further pressure on people in LICs and MICs.

Resource scarcity is aggravated by Growing Consumerism. For example, while technology is becoming increasingly cheap and dependencies on technological solutions grow, 'our consumption of the precious metals and minerals required to produce such products has also grown significantly' (Deloitte, 2017). Although there are 'positive signs of increasing awareness of consumerism related problems, mostly between young people' (Forum for the Future, 2019), a new consumer class is being created that by 2030 'is expected to reach 5 billion people. This means 2 billion more people with increased purchasing power than today' (EU Commission, 2018). As an example, South-East Asia's economic growth is creating a new middle class that is increasing its share of global consumption (see **Figure 30**).

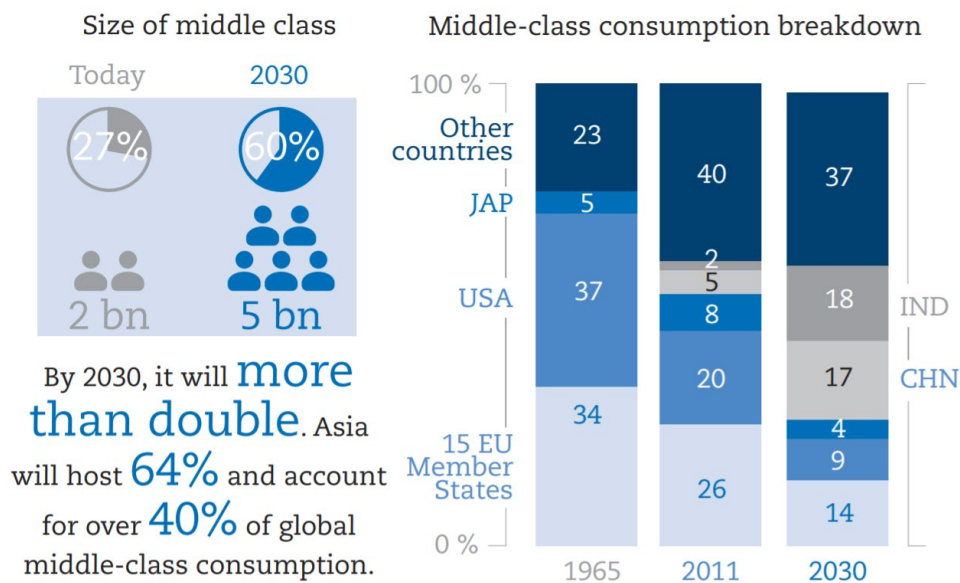
Figure 29: Food loss and waste along supply chains



Note: Initial production is edible part originally intended for human consumption.

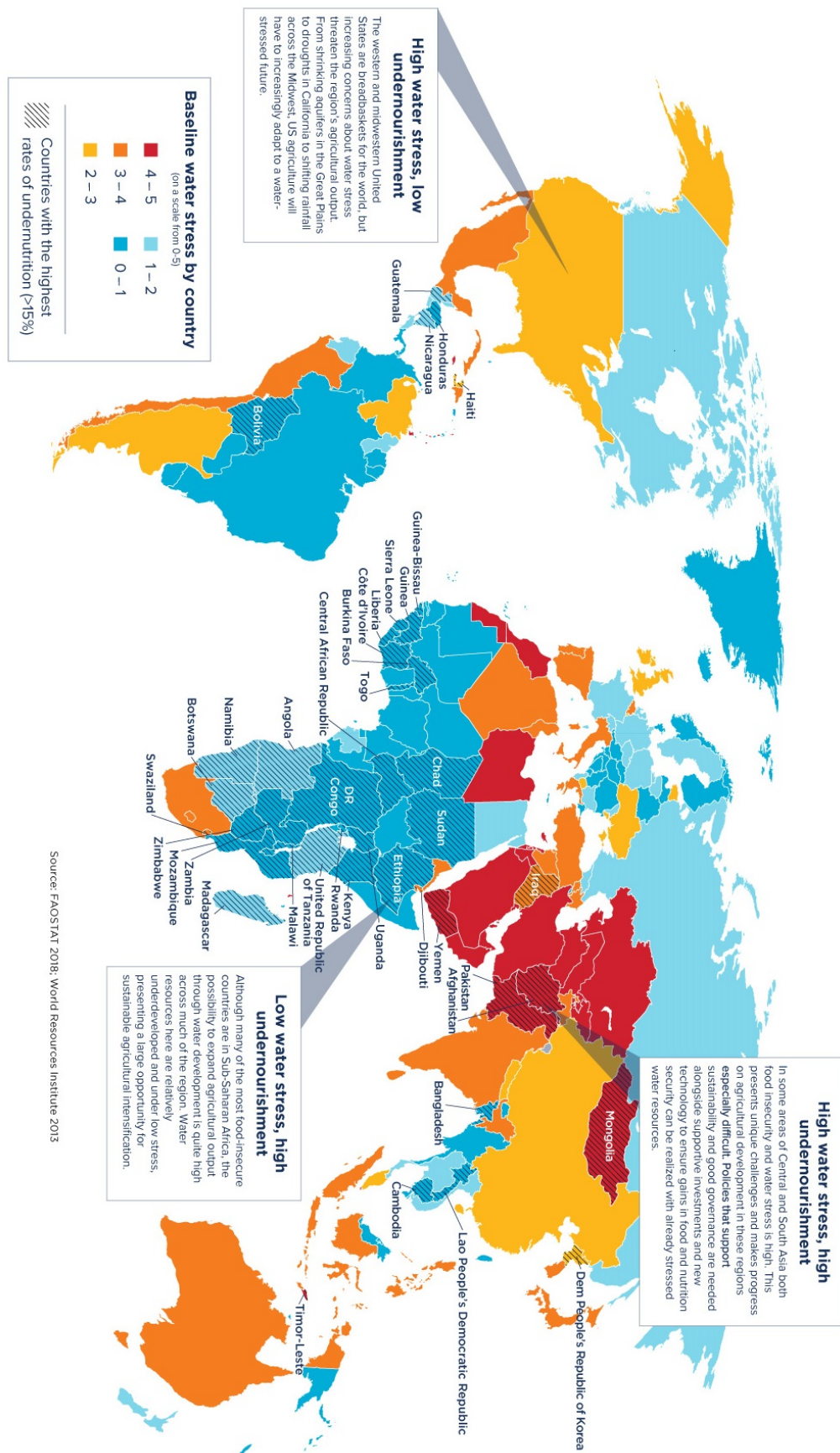
Source: HLPE (2014), based on FAO (2011), cited in FAO (2017). Graphics: FAO (2017, p. 114).

Figure 30: The number of middle-class consumers is increasing, particularly in Asia



Source and graphics: OECD (2016, p. 15).

Figure 31: Prevalence of hunger and water stress



Source and graphics: Rosegrant, Cousin and Kawamura (2019).

4.3 CRITICAL NOTES

Although most of the sources consider Climate Change a megatrend, its effects are somewhat underplayed. Some of the sources are a couple of years old, and only at the time of writing Climate Change started to receive massive public attention, as evident in the school strikes and recent teachers polls on what matters (YouGov, 2019).

If the world is indeed marching towards a climate breakdown with catastrophic consequences, Climate Change is the most important trend on which to focus. Humans have only few years left to avoid the 1.5 degrees Celsius increase in temperatures with irreversible effects on the planet. But it's important to acknowledge that this rhetoric places climate breakdown at a point in the future, as if we are close to crossing a line that, all of a sudden, will turn the climate upside-down. Instead, the effects of climate breakdown are already very real and affecting people's livelihoods (Allen, 2019). Extreme weather events, floods and droughts are hitting 'the poorest countries hardest as these are particularly vulnerable to the damaging effects of a hazard and have a lower coping capacity and may need more time to rebuild and recover' (Eckstein et al., 2019; cf Julie-Anne and Simon, 2017). Climate breakdown is, however, become of increasing concern for higher GDP nations, as evident in debates around the recent Australian bushfires (Gergis and Cary, 2020; Mann, 2020).

Technological solutions such as renewable energies will be useful, but not enough to save the planet; a drastic turnaround in consumption patterns and production methods is inevitable. Particularly in HICs, the biggest per capita emitters of GHGs, the gravity of the climate emergency calls for a rethinking of our entire economic system.

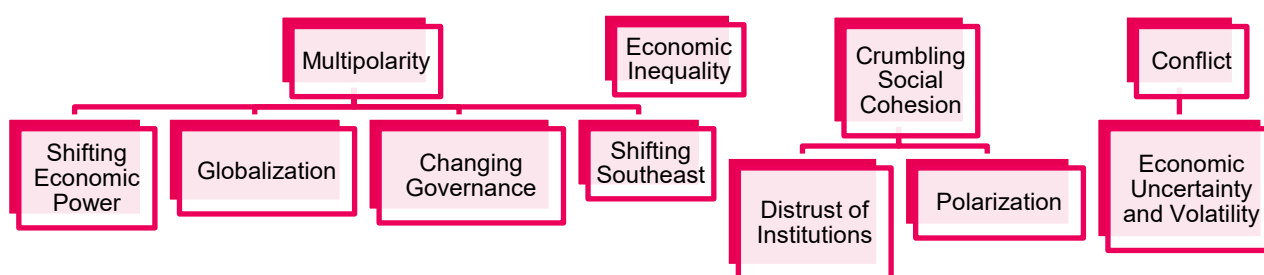
The literature identifies the causal relationship between Climate Change and Displacement, which results in Migration. However, one gap in the literature concerns those who will be the most affected by climate change. The costs of climate-related disasters, droughts and floods ultimately fall on low income households, particularly in areas where welfare protection and state help are weak or absent. Poorer and fragile areas and households are those most affected by climate change, and the least resilient to its effects. Being usually poorer, minorities and women have to cope with a proportionally higher burden. Moreover, 'women's unequal participation in decision-making processes and labour markets compound inequalities and often prevent women from fully contributing to climate-related planning, policy-making and implementation' (UNFCCC, 2019).

5 SHIFTING POWER

The Shifting Power cluster (see **Figure 32**) concerns the political, economic and social forces shaping the future. Much attention is given to changing decision-making processes, especially given the tension between an increasingly interconnected global system and growing voices for more decentralized and localized forms of governance. It includes five megatrends – Multipolarity, Economic Inequality, Crumbling Social Cohesion and Conflict – and the sub-trends:

- Shifting Economic Power;
- Globalization;
- Changing Governance;
- Shifting Southeast;
- Distrust of Institutions;
- Polarization; and
- Economic Uncertainty and Volatility.

Figure 32: Shifting Power megatrends and sub-trends



5.1 MULTIPLICITY

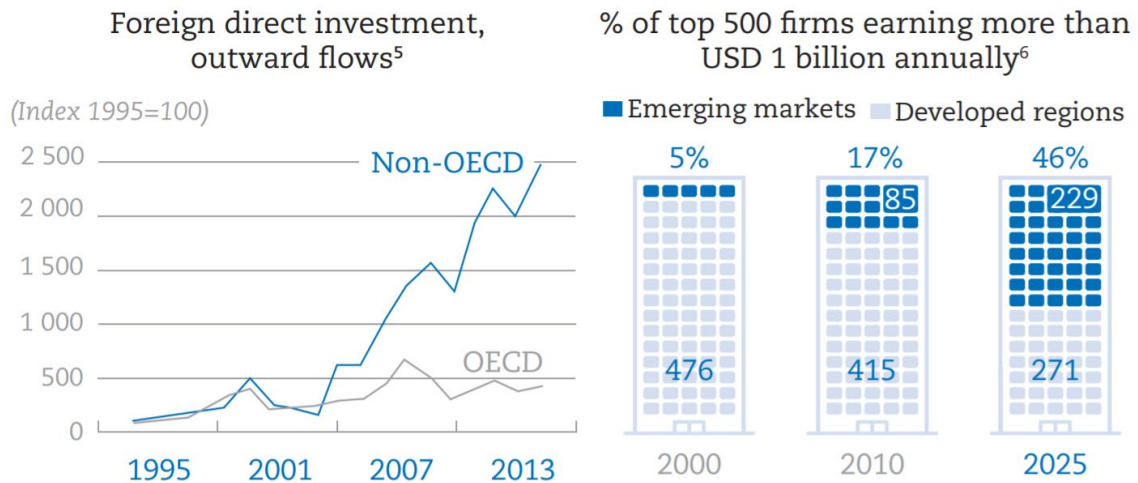
The rising power of new or re-emerging global actors; the shift of power towards new forms of governance; and increasing localism.

Multipolarity describes a shift towards a world in which power is distributed between more and more diverse players. While the term is commonly used in relation to power distribution between nation states, in this paper we use it to refer to the erosion of traditional forms of governance, both internationally and locally. This usage helps to embrace the different narratives around Shifting Power in the sources we reviewed.

Multipolarity is fuelled by the increasing prominence of multinational corporations from emerging economies, and the shifting centre of gravity of the world economy to the Indo-Pacific (OECD, 2016; see **Figure 33** and **Figure 34**). The power of private corporations and the regulation thereof shows the limits of a global governance system based on nation states.

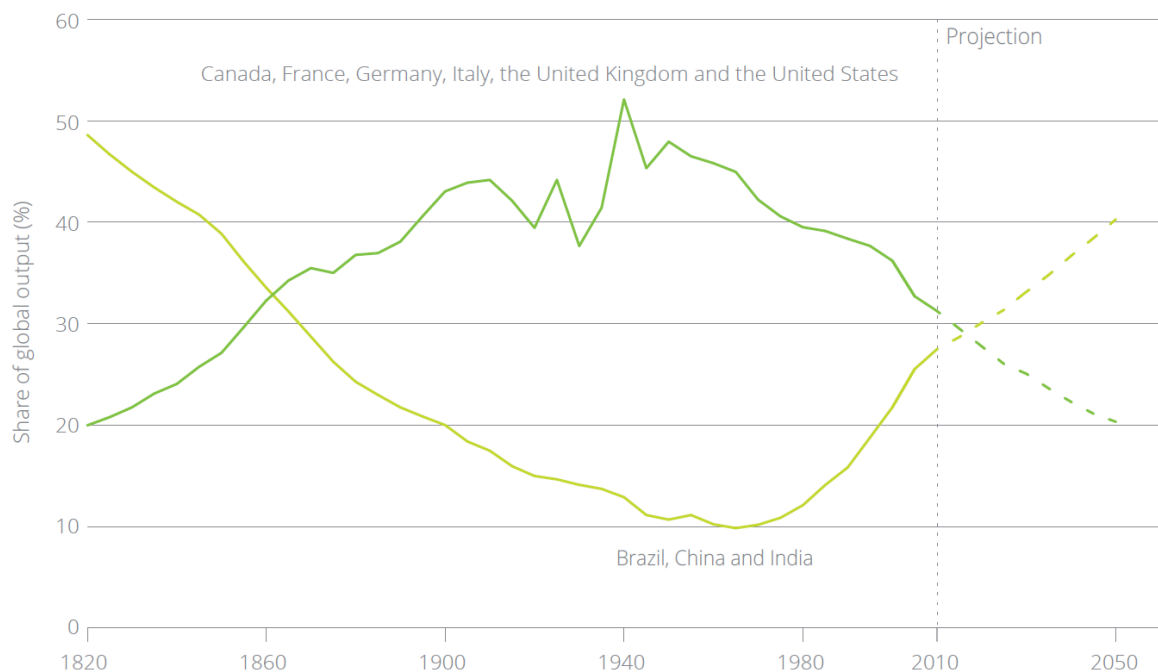
The rise of the Indo-Pacific region is well identified in the growing share of global GDP that China and India hold – and are expected to gain (see **Figure 35**). According to Laudicina et al. (2018), ‘the Indo-Pacific is a new megaregion at the heart of the global economy and political competition’. China’s Belt and Road Initiative (BRI) is a clear example of the country’s rise in global influence. The BRI is about much more than land and maritime commercial routes to secure access to markets: according to Eder (2018) it ‘is a key part of Xi Jinping’s grand foreign policy design to increase China’s influence in its regional neighbourhood and beyond’.

Figure 33: Growth of emerging economies as key global players



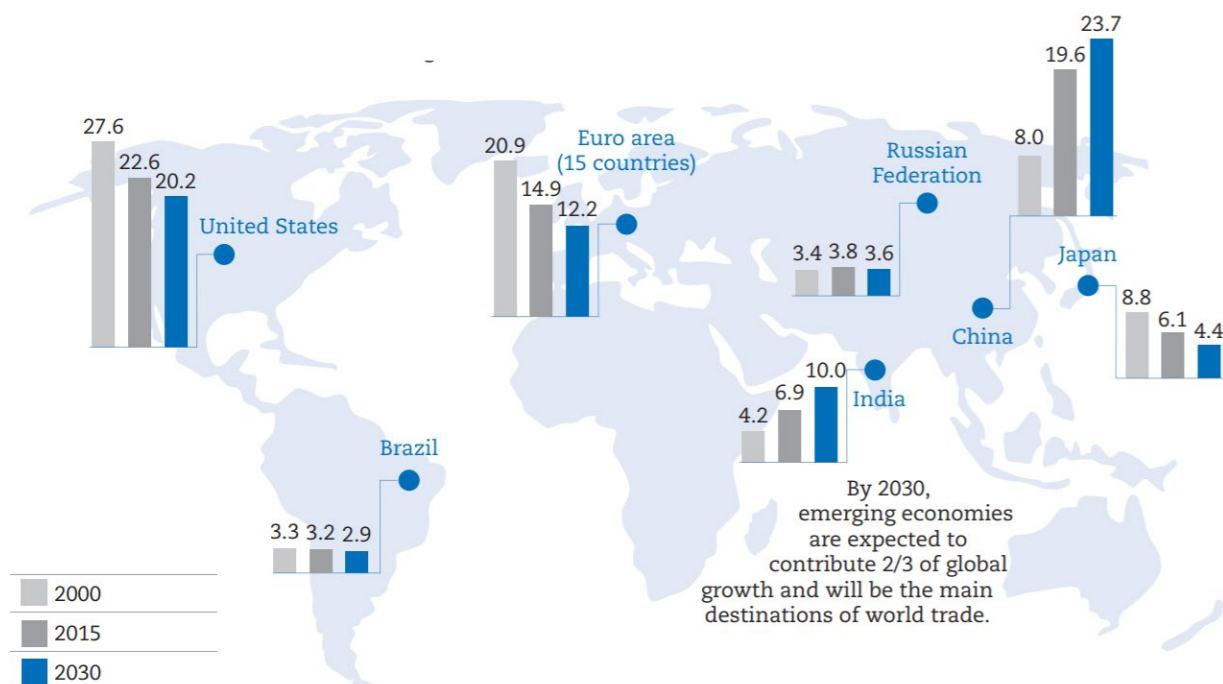
Source and graphics: (OECD, 2016, p. 8).

Figure 34: Brazil, China and India projected to account for 40% of global output by 2050



Source: UNDP (2013). Graphics: Deloitte (2017, p. 47).

Figure 35: The centre of gravity of the world economy is shifting southeast (percentage of world GDP)



Source and graphics: OECD (2016, p. 12).

Multipolarity includes phenomena that will require increased management of the tensions around multi-level governance. For example, localism is growing, whereby ‘non-state actors, global conscientiousness, social media and internationalization of decision-making are forming new, multi-layered governing systems’ (European Commission, 2018). Another example mentioned in the Demography cluster is the emergence of megacities as important global actors. Forms of direct democracy can ‘severely affect the trajectory of several political and economic debates’, while new technologies – like blockchain – mark the advent of ‘a decentralized form of governance aided by technology’ (Deloitte, 2017).

It is difficult to think of Multipolarity in terms of positive and negative due to its intrinsically political nature; a force perceived as positive by one party will be contested by opposing parties. Consequently, the comments below are more limited in scope.

Positive perspectives

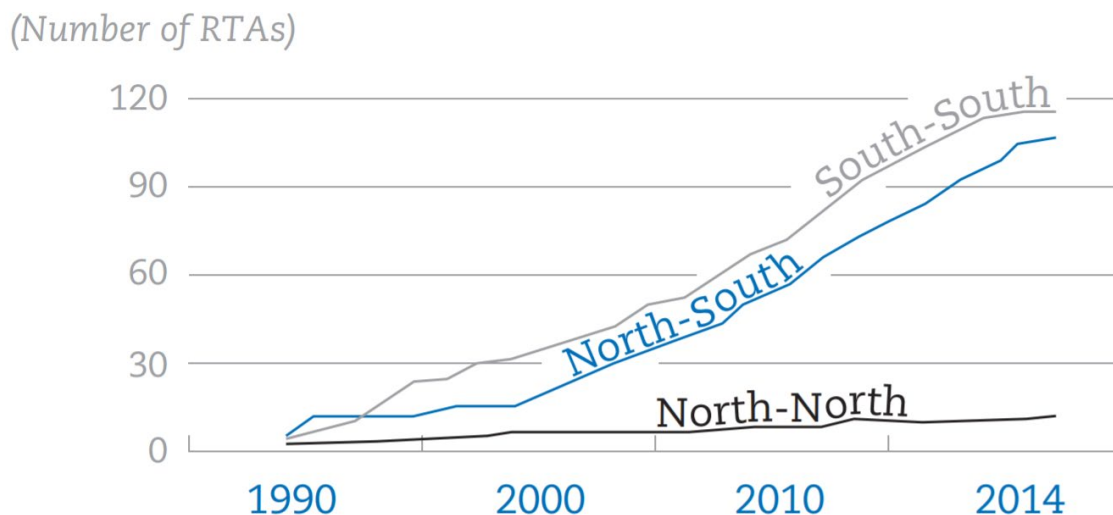
When considering the effects of Hyperconnectivity and Multipolarity, it is worth noting that ‘increased access to the Internet empowers individuals to engage in decision making, thereby potentially shifting power from the traditional elites to the broader population’ (Retief et al., 2016). Multipolarity can also be found in increasing cooperation and trade agreements between countries in the global South (see **Figure 36**). For international NGOs the shift towards a multipolar world will probably encourage more South-South development cooperation (SSDC), which also relates to the possible decrease of HIC spending on aid caused by shrinking tax bases and slowing economies (see **Chapter 3** on Demography).

Negative perspectives

Multipolarity and the emergence of new forms of governance and political actors is linked in the sources to a more divisive and unstable world. Although SSDC might increase, LICs could become even more marginalized if, when their usual advocates in the global South become

powerful, they align themselves with the global North (Ferris, 2011). Also, according to Pano (2019), ‘while recognising SSDC as an invaluable resource, it must also be emphasized that it is not an alternative to fully transformed and substantially increased north-south development cooperation’.

Figure 36: South-South regional trade agreements (RTA) are on the rise



Source and graphics: OECD (2016, p. 8).

5.2 ECONOMIC INEQUALITY

Changes in the distribution of income, wealth and opportunity between different groups in society and between countries.

Income inequality is widely accepted in the literature to have increased over recent years (see **Figure 37**). According to EYQ (2018), ‘while globalization has helped lift more than a billion people out of poverty [reducing the share of population living on \$1.90 per day] ... it has increased income inequality within nations at every income level’. UN DESA (2019) states that: ‘more than two thirds of the world population are now experiencing rising income and wealth inequality’.

Poverty has reduced sharply ‘in East Asia and the Pacific, as well as in South Asia, which has been largely attributed to the rapid economic growth of China and India’, and decreased modestly in sub-Saharan Africa (Dugarova and Gülasan, 2017). However, population growth has meant that the absolute number of people living in extreme poverty – less than \$1.90 a day – in sub-Saharan Africa ‘rose from 276.1 million in 1990 to 388.7 million in 2013’ (ibid.). Furthermore, World Bank estimates show that decline of extreme poverty is slowing down. While from ‘1990 to 2015, the extreme poverty rate dropped an average of 1 percentage point per year – from nearly 36% to 10%, it dropped only one percentage point from 2013 to 2015’ (World Bank, 2018). ‘By 2030 ... poverty will remain in double digits in Sub-Saharan Africa’ (ibid). Since the global economic crisis in 2008, poverty reduction has slowed in many other areas, such as Latin America and the Caribbean, and countries including Russia, Belarus and the Kyrgyz Republic (Dugarova and Gülasan, 2017.).

The drop in global inequality observed in the early 2000s might be reversed ‘if inequality within countries continues to rise’ (Bourguignon, 2016, cited in ibid.). Between others, threats to economic equality are climate change and the economic slowdown in rapidly growing economies – such as China – due to volatility in commodity prices (ibid.).

Growing economic inequality is one of the primary reasons for the Crumbling Social Cohesion sub-trend (see **Section 5.5**). Inequality in wealth and access to opportunities have far-reaching effects, as they ‘discourage skills accumulation, [and] choke economic and social mobility, and human development’ (UN DESA, 2019). This lack of opportunity increases economic and social uncertainty, vulnerability and insecurity, undermining trust in institutions and fostering social discord that ‘could possibly trigger violence and conflicts’ (ibid.).

EYQ (2018) asserts that ‘deepening economic inequality is due to job disruption’ from technological innovation. Indeed, globalization and automation polarize the labour market, widening earning disparities (McKinsey & Company, 2017). Alongside decreasing real wages, increasingly precarious employment and more non-standard jobs, the growing global middle class finds itself more urbanized, indebted and fragile (OECD, 2016).

[The global middle class] still faces significant barriers in the way of economic resources and a result of wealth inequities, and a pervasive frustration has emerged with the social status quo.

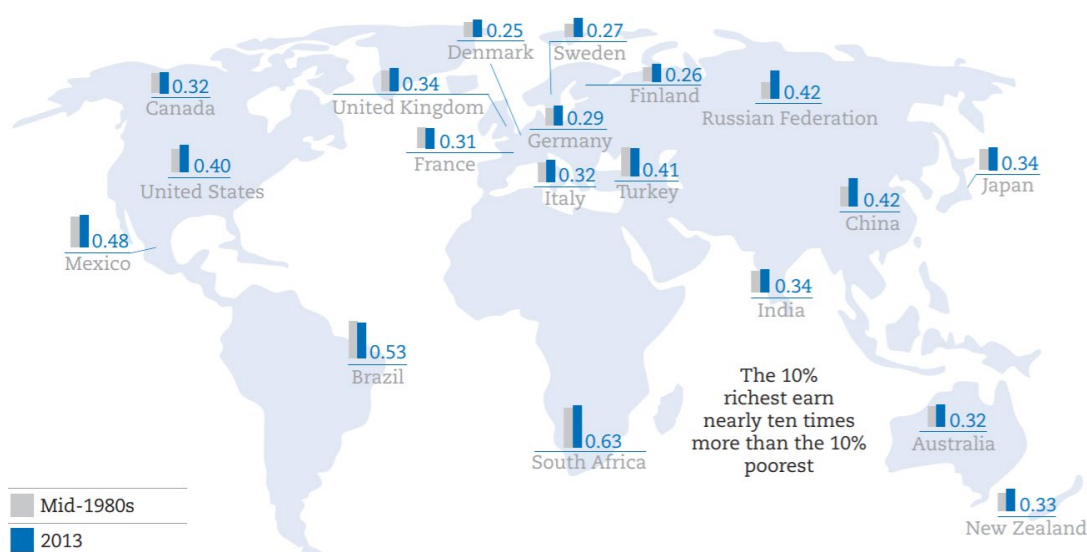
Deloitte, 2017

Another form of economic inequality mentioned in the literature is gender inequality, the only sub-trend identified that refers to gender-differentiated impacts. It refers to those ‘inequalities women and girls face [that] limit their access to productive resources, services, and decision-making processes’ (FAO, 2017). It also refers to gender gaps in the labour market, salaries, employment and unpaid care burdens. Women are found to be ‘15 percent more likely to be unemployed than men globally’, and ‘tend to earn on average 23 percent less than men, which can be attributed not only to differences in education or age but also to the undervaluation of women’s skills and work, including care and household work’ (UN, 2016, and ILO, 2016, cited in Dugarova and Gülasan, 2017). Nevertheless, women tend to work ‘50 minutes more a day than men if both paid and unpaid forms of work are considered’ (WEF, 2016, cited in ibid.).

Most sources that touch on gender inequality agree that, at current rates, it will take a long time to finally close the pay gap. According to EU Commission (2018), the:

...current global average gender pay gap is 23%; at present rates of change, the global economic gender gap at work will not be closed for 217 years, while in the G20 countries it would take ... 75 years to achieve equal pay for equal work.

Figure 37: Gini coefficients in selected countries, in the mid-1980s and 2013



Note: Gini coefficients. Source and graphics: OECD (2016, p. 16).

5.3 CONFLICT

An escalating clash or disagreement, inter- or intra-state, that might lead to violence or war.

Conflict is defined in all references in the sources as an increasing clash or disagreement causing crisis, and potentially leading to more serious physical conflicts, violence or war. Conflict is often connected in the sources to Multipolarity, Resource Scarcity and Economic Inequality.

The number and intensity of violent conflicts have been rising since 2012, often as a result of 'entrenched intragroup inequalities and livelihood insecurities due to economic slowdowns, climate-related disasters, forced displacement, epidemic outbreaks, ill-designed policies and capricious behaviour of authoritarian regimes' (UN DESA, 2019).

As Multipolarity both exacerbates and is fuelled by political tensions and fights over resources, escalations include trade wars, proxy wars, arms races and full-blown wars. Conflict is also considered to be involved in a similar vicious circle with Climate Change and Migration, although there is no simple causal link. The effect of global warming on livelihoods is amplifying economic instability and insecurity, resulting in increasing migratory pressures and potentially violence and conflicts that 'in turn accelerate deforestation and environmental degradation, and undermine the political and administrative capacities to cope with climate change' (ibid.). Politically, Conflict is strongly connected to Crumbling Social Cohesion (see **Section 5.5**) due to increasing radicalization.

Militarization of aid is a consequence of the Multipolarity and Conflict sub-trends: the increasing politicization of aid means that militarization and opportunism in humanitarian aid delivery is intensifying. According to Pano (2019), 'despite long-standing Development Assistance Committee (DAC) principles that ODA [Official Development Assistance] should not support financing of military equipment or services, diversion of aid to military and security spending persists'.

Economic Uncertainty and Volatility

Economic Uncertainty and Volatility is also caused by and triggers conflict:

Ongoing conflicts have already had negative impacts on economies and societies at national and regional levels, with poverty being most intense in fragile and conflict affected states. And yet they could lead to an even more pronounced slowdown in the world economy, while threatening global stability and continuing to challenge social progress.

World Bank Group, 2016, and UN DESA, 2015, cited in Dugarova and Gülasan, 2017

Many sources refer to the uncertainty of the global economic future, with venture capitalists predicting the burst of the tech bubble (Deloitte, 2017), and others seeing a possible fall in commodity prices and recession in Western economies following a shift in China's own production to meet internal consumption (PWC, 2019). Besides Conflicts, other factors affecting economic uncertainty and volatility are: stronger 'mutual global dependencies'; the increasing incidence rate of international crises that do not leave time for countries to make full recoveries; increasing international inequalities; changes in industrial structures and the emergence of disruptive innovations; and 'speculative investment activities' (Z_punkt, 2019). The increasing interconnection of the world economy means that 'significant political and economic structural changes in one region have huge impacts on major financial markets, leading to increased volatility' (Deloitte, 2017).

As stated by UN DESA (2019), it is most likely that the average global growth rate in 2015–30 will be 3%, below the rate achieved in 2000–15, despite the economic crisis that hit during the latter. This is due to rising economic inequality and uncertainty, trade disputes, conflicts and technological change (ibid.). Although economic shocks can be global, they particularly affect LICs and MICs. These countries managed to absorb the 2008 crisis, but the responses ‘increased fiscal deficits and deteriorated current-account balances’, leaving them with ‘limited capacity in future to absorb another major economic shock’ (UN MDG Gap Task Force, 2015, cited in Dugarova and Gülasan, 2017).

5.4 CRUMBLING SOCIAL COHESION

The threats to social cohesion posed by inequality and divisive narratives.

Crumbling social cohesion is closely linked to economic inequality and marginalization of sectors of society, as well as the increasing use of social media in political discourse. This megatrend refers to the rise of nationalism and protectionism fuelled by divisive, populist narratives able to exploit discontent in an increasingly unequal and polarized society.

According to the Forum for the Future (2019), nationalism is on the rise due to several deep and structural cultural and economic factors, ‘such as growing income and wealth inequality, demographic change, ... increases in domestic and international migration, ... perceived impunity of corrupt elites ... and very new and poorly regulated social media tools [that] are a powerful divisive force’.

Other sources recognize the increasing significance of migration as a political concern, at least with respect to HICs (EU Commission, 2018; Deloitte, 2017). Moreover, fragile social cohesion can be shaken by the use of social media. As already discussed under Hyperconnectivity, social media platforms are powerful tools of the ‘attention economy’, the ‘business model of internet platforms that seek to stimulate a user’s emotional response by perpetuating polarization, shock and novelty’ (Forum for the Future, 2019). This mechanism generates ‘networks of ideological thinkers’ that are ‘no longer constrained by proximity and are able to grow exponentially with new followers who seek sources of insight online’ (Deloitte, 2017).

A key aspect is people becoming ‘more entrenched in their individual value systems’, resulting in political apathy and ‘politicism in scientific reasoning’ (ibid.). Trend One (2019) identifies ‘a creeping sense of paranoia regarding the onset of permanent threats’ that is reducing trust in central institutions. Social media mutually reinforces this Distrust of Institutions sub-trend, not only by being a vehicle for disinformation, but also by bringing institutions closer to the public, and connecting public figures and citizens in ways beyond what was once filtered solely by traditional media. According to the EU Commission (2018), ‘the possibility of buying millions of ‘followers’ for social media platforms is undermining credibility, impacting the decisions of an increasingly confused citizenry’. Social media can act as community aggregator in the spreading of beliefs that profoundly challenge common scientific understanding. Sometimes this spread is a form of manipulation, while in other instances it is an amplification of an already deeply seated distrust in institutions. Examples of such communities are: vaccine hesitancy (‘anti-vax’), flat-earthers, and climate change deniers.

5.5 CRITICAL NOTES

While militarization of aid is not highlighted in the literature, it is particularly relevant for international development. It has a strong relationship with Migration, particularly if funding and development programs are connected to securitising a region and prevent migration, as for the EU Emergency Trust Fund for Africa (Davitti and Ursu, 2018). While this might offer

opportunities for economic development, it can pose great risks if projects are connected to a sense of urgency to stop irregular immigration (Kervyn and Shilhav, 2017).

Most of the literature identifies some gendered dimensions in the Shifting Power cluster. There are a number of references to:

- increasing participation of women in formal education;
- the persistence of the gender pay gap; and
- gender inequalities in income and other areas.

6 USING TRENDS TO QUESTION ASSUMPTIONS

LIMITATIONS OF THE LITERATURE

This ‘scan of scans’ has identified where the reviewed literature agrees on the trends that will be shape the future of every person on the planet. It is not an in-depth discussion of each trend and sub-trend (**Figure 38**) – only a review of how the literature refers to the key dynamics. It is clear that gaps exist in the literature, for example around gender-related trends and civic freedoms. We do not agree with several tendencies that emerged from our reading, for example:

- The focus on the migration crisis as a European one, when 85% of refugees live in LICs and MICs.
- The technological optimism about solving environmental crises.
- The uncritical assumption that dealing with a youth bulge just requires jobs, without considering what constitutes decent work.

These gaps and biases are in and of themselves important to note – they highlight those problems that remain invisible and where misunderstandings prevail.

HOW TO USE TRENDS ANALYSIS

No amount of discussion or data can give certainty about the extent or consequences of the megatrends in different parts of the world or for specific groups of people. Inherent in trends analysis is uncertainty – of extent, speed and consequences. But forecasting uses trends to make estimates of the future based on past and current data. It gives the benefit of thinking forwards, grounded in realism about what is emerging.

What might these megatrends mean for organizations working to reduce poverty and the inequalities that cause and perpetuate it, even if the precise rates or impacts are unknown? The question must be asked about whether the decisions taken today on thematic or geographic priorities sufficiently recognize the inevitability of these trends.

Understanding trends and possible scenarios allows for critical ‘what if’ thinking. For example: what if everyone was digitally connected by 2030? What might this mean not only for how we work – ‘digital first’ – but for power concentrations that could lead to further data inequalities? On the other hand, what if there is a persistent digital divide geographically or demographically? These two entirely different scenarios, both possible, need to be explored. How will regions with a youth bulge be fed, and are processes underway to ensure the knowledge base for the decent jobs these young people will soon need? Such questions must be imagined.

Any initiative that seeks justice and equality is based on assumptions about geographical or thematic priorities, urgency, impacts on specific groups, the possible contribution of different organizations, and how change might happen. Whether explicit or implicit, we act based on how we understand the world. Thinking through the possible consequences of emerging trends

helps revisit such assumptions. Trends analysis invites thinking about operational assumptions, such as the external context in which the work takes place.

For example: if the goal is achieving food security in a location, what are the implications of Hyperconnectivity or Crumbling Social Cohesion or Demographic Shifts on possible pathways? What does support to civic space look like in the context of polarization, given the pros and cons of Technological Innovation?

Six steps to be fit for the future

An organization can put trends analysis to work through six tasks:

1. **Identify trends not on the radar.** Which of the trends in this report are on the organizational radar – explicitly – in terms of their possible implications for thematic, geographic and operational choices? Which ones are being ignored and should be taken more seriously? Given that the megatrends discussed here come with in-built biases, what other trends are key where organizations such as Oxfam are active?
2. **Focus on (virtual) geographies that matter.** How might these megatrends look in each region and country, mindful that such data may not be available on all trends? Might virtual communities and cities become more powerful ‘change hubs’ than geographic communities, nation states?
3. **Think through impacts on different groups of people.** How might these megatrends – individually and together – affect poor/marginalized populations, especially women and girls? Operationally, if an organization is opting for a ‘digital first’ way of influencing or programming, which groups are inadvertently being privileged or excluded? If the assumption is that CSOs are critical for success, how will this play out in the many contexts where social cohesion is being eroded? For whom are impacts happening now, in the near future or later? And what does this mean for how to support those struggling under conditions of poverty or social marginalization?
4. **Figure out opportunities and challenges using a systems perspective.** While each megatrend could potentially help or hinder, it is in the interaction of trends that the real effects will be felt. What do we assume about each megatrend and how it will affect others? What new options can emerge within these interactions to tackle poverty and inequality? For example, is there sufficient recognition of the potential of the Youth Bulge when we think of inequality-reducing advocacy? Is enough known about how automation might give new chances for digital economy employment opportunities in refugee camps? How can the urgency to reduce water use by food systems trigger changes in agricultural production that better meet global nutritional, rather than only calorie, needs?

How we think about the world – as single trends or as a system of interactions – will affect how we act. A systems perspective has led to new concepts like ‘resilience’ that recognise interacting forces. Looking at trends as separate phenomena would ignore the known unknowns, of, say, a deadly virus and its potential impact on economies and demography. It would also ignore the complex interactions that lead to ‘unknown unknowns’. Such unknowns can be accommodated by organizations through constant horizon scanning, seeking surprise, and undertaking the kind of ‘what if’ thought experiments that this paper hopes to encourage.

5. **Decide which trends to take on and what roles to play.** While all these trends will affect any work, an organization needs to decide what role they can and want to play. What kind of agent of change and what kind of change does it want to support in relation to each megatrend? Such discussions can help clarify organizational identity and mission amid global changes. Each trend is inherently political, affected by myriad power relations, thus not favouring those unable to influence decisions. If an organization is clear how it will respond to or incorporate each trend into its work, then clarity is needed about scales of response. A minimalist approach on, for example, rural–urban migration would mean not

investing time deciding whether an organization is 'for' or 'against' this inevitable trend, but rather understanding what is going on and focusing on reducing negative effects on those groups it cares about most. A maximalist approach might focus on generating livelihood opportunities to reduce the need for employment and service-driven migration.

6. **Reimagine partnerships, roles and possibilities.** With the emergence of new polarities, economic drivers and geographies of action, are new partnerships spotted and fostered to shape the role of NGOs? Is an organization well placed to be part of an intervention that aligns with its identity, mission and strengths? Is there an organizational ability to fund meaningful work? What do trends suggest for other key operational assumptions, such as the ability to raise funds? For example, diminishing tax revenues and a slowing economy in the global North might result in a reduction of commitment in humanitarian assistance, raising the question of scale and quality of engagement from emerging economies.

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ANNEX 1: MATRIX OF MEGATRENDS IN SOURCES

	Blackrock	Boumphrey & Brehmer	Deloitte	Dugarova & Gülasan (UNDP-UNRISD)	EEA	EU Commission	EYQ	FAO	Forum for the future	Laudicina et al. (AtKearney GBPC)	McKinsey & Company	OECD	Pano (BOND)	PWC	Retief et al.	Smiths Group	Sydney Business Insights	Trend One	UN DESA	Wall S. (HP)	Winston A. R. (MIT)	Z_punkt		
	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	Technological innovation
	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	Demographic shifts
	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	Hyperconnectivity
	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	Climate change
	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	Urbanisation
	0	3	0	2	0	3	2	3	1	0	3	1	2	2	3	0	3	3	3	3	3	3	3	Resource scarcity
	3	0	0	0	0	3	0	3	3	3	2	3	3	3	0	3	3	3	3	3	3	3	3	Multipolarity
	3	2	2	1	3	2	3	0	2	0	3	3	2	0	3	3	3	0	1	2	0	2	2	Changing work
	1	2	2	0	0	2	3	0	2	0	2	3	0	0	3	3	1	2	3	2	3	2	2	Ageing population
	3	2	2	3	0	1	0	2	1	3	3	1	0	0	3	2	3	0	3	2	0	0	0	Economic inequality
	1	2	0	2	0	2	0	0	2	3	2	0	0	3	3	1	3	0	3	2	3	0	0	Migration
	2	0	0	3	0	0	0	0	0	3	2	0	3	2	3	0	1	3	3	2	0	0	0	Conflict
	1	2	0	2	1	2	0	2	1	0	1	0	0	0	3	1	1	2	3	0	3	2	2	Growing population
	2	2	2	0	3	1	3	0	1	0	0	2	0	0	0	2	1	0	0	3	2	2	2	New technologies
	1	2	2	2	1	2	0	0	1	0	0	1	3	3	0	3	1	0	1	3	0	0	0	Crumbling social cohesion
	0	0	0	1	1	0	3	2	0	0	0	0	0	0	0	3	2	3	3	2	1	0	2	Health challenges
	3	0	0	0	1	1	0	2	0	0	2	3	0	3	0	2	1	2	0	3	0	0	0	Changing governance
	3	0	0	3	0	0	0	0	0	0	1	2	2	0	0	0	0	0	3	3	2	0	1	Economic uncertainty & volatility
	1	2	2	0	1	2	0	0	0	0	1	2	0	0	0	2	1	0	1	3	0	2	2	Automation & robotisation
	0	2	0	2	1	2	0	2	1	0	0	0	0	0	2	2	0	2	0	1	0	0	2	Food/water scarcity
	1	2	2	0	1	1	2	0	1	0	0	3	2	0	0	1	1	0	1	0	0	0	1	Digital security
	0	0	0	0	0	3	0	2	2	0	0	2	0	0	0	1	1	1	0	0	0	3	3	Shifting economic power
	0	0	2	0	1	0	3	2	0	0	3	2	0	0	0	3	1	0	0	1	0	0	0	Globalization

	Blackrock	Boumphrey & Brehmer	Deloitte	Dugarova & Gillasan (UNDP-UNRISD)	EEA	EU Commission	EYQ	FAO	Forum for the future	Laudicina et al. (At Kearney GBPC)	McKinsey & Company	OECD	Pano (BOND)	PWC	Retief et al.	Smiths Group	Sydney Business Insights	Trend One	UN DESA	Wall S. (HP)	Winston A. R. (MIT)	Z_punkt		
	1	0	2	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	1	Disruption
	2	0	0	0	0	0	0	1	1	2	0	1	1	0	0	0	0	0	0	0	0	0	2	Shifting southeast
	1	0	0	0	0	0	0	0	2	0	0	1	0	0	2	1	0	0	0	0	0	0	0	Pollution
	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Displacement
	0	0	0	0	2	2	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	Social media
	0	0	0	0	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	Sustainability
	2	0	0	2	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	GHG emissions
	0	0	2	0	0	1	0	2	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1	Shrinking tax base
	0	0	2	0	1	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	Growing consumerism
	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Climate-related disasters
	0	2	0	0	3	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	Data explosion
	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Changing food systems
	0	3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Renewable energy
	0	0	0	0	0	0	0	0	0	0	3	0	0	1	3	0	1	1	0	0	0	0	0	Transformation of education
	0	0	2	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	Retirement savings gap
	1	0	0	0	1	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	Changing industry
	0	0	0	1	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	Distrust of institutions
	1	0	2	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	Centrality of consumers
	0	0	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Gen Y and Z
	1	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Youth bulge
	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Polarisation
	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Loss of biodiversity
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Populism
	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Human augmentation

Blackrock	Boumphrey & Brehmer	Deloitte	Dugarova & Gulasan (UNDP-UNRISD)	EEA	EU Commission	EY/Q	FAO	Forum for the future	Laudicina et al. (Atkearney GBPC)	Mckinsey & Company	OECD	Pano (BOND)	PWC	Retief et al.	Smiths Group	Sydney Business Insights	Trend One	UN DESA	Wall S. (HP)	Winston A. R. (MIT)	Z_punkt	
0	0	2	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Female participation in formal workforce
1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	Rising sea levels
0	0	0	0	3	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Personalisation
3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Business ecosystems
1	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	Growth opportunity
0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Privacy issues
1	0	0	0	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	Need of Infrastructures
0	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Clean tech
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Asian consumerism
0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	Energy scarcity
0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	Pay gap
0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Smart cities
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Decentralisation
0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Growing middle class (in global south)
1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	Terrorism
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Nationalism
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Plastic pollution
3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Weakening traditional gender roles
0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Transparency
0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Fake news
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Gender disparity
0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Digital divide
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Pandemics
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Sharing economy
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Collaborative work

	Blackrock	Boumphrey & Brehmer	Deloitte	Dugarova & Gillasan (UNDP-UNRISD)	EEA	EU Commission	EYQ	FAO	Forum for the future	Laudicina et al. (At Kearney GBPC)	McKinsey & Company	OECD	Pano (BOND)	PWC	Retief et al.	Smiths Group	Sydney Business Insights	Trend One	UN DESA	Wall S. (HP)	Winston A. R. (MIT)	Z_punkt	
	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	Growing middle class
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	CSR
	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	Mass extinction
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Power shifts
	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	Individualism
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	Empowerment
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Augmentation
	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	Food revolution
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Disengagement
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	Dematerialisation
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	Blurring Boundaries
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	Healthstyle
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Biotechnical Transformation
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	Security challenges
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	Circular economy
	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Manipulation
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Changing values
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	Attention economy
	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	Militarisation of Aid

ANNEX 2: METHODOLOGY

In order to find the consensus around megatrends, labels were created as broad descriptors of similar phenomena found in different sources. As described in **Chapter 1**, the labels for megatrends were identified from recurring key words or phenomena. The labels were intended to encompass the similarities found in different sources, even if these might describe megatrends with slightly different terminology.

When analysing the text of the source, each text fragment (sections of the document where a trend or a correlation between trends is described) was allowed up to five labels, to capture the sources' descriptions of interacting phenomena. As an example, **Box 3** shows how a piece of text from BlackRock (2018) has been labelled.

Box 4: Analysis of a paragraph from BlackRock (2018)

'Technology start-ups will replace traditional manufacturers. 'Old' industries like appliance and car manufacturers are facing a serious situation – they either invest in the next era, or risk obsolescence. The CEO of Trimble (U.S. automation company) said that "companies that don't invest in automation now, will not exist in 5 years' time". The race for 'edge' through technological advantage is on, and the incumbents will have to fight to hold their position.'

Labels

1. Technological innovation
2. Automation and robotization
3. Changing industry
4. Disruption

We were then able to quantify the number of mentions of a particular label. The mentions of megatrends/sub-trends in different sources were compared by considering the relative frequency with which these labels appeared, assigning a number of points between one and three:

- Three points corresponds to a label either appearing in the headings of the source or being explicitly referred to as 'megatrend'.
- Two points were assigned for labels appearing for more than 2.5% of the total labels assigned to a specific source.
- One point was given for the remaining labels.

The 2.5% threshold was derived by an empirical and iterative method: after running a sensitivity analysis that tested the result with different percentages, we chose a cut off that would allow for a more nuanced assessment of the relative frequency of trends. As up to five labels are assigned per piece of text – to link different trends together – assigning more points to recurrent labels also means attributing more importance to trends that have more interconnections with others, a result in line with the objectives of this research. The sources were then compared in a matrix (see **Annex 1**).

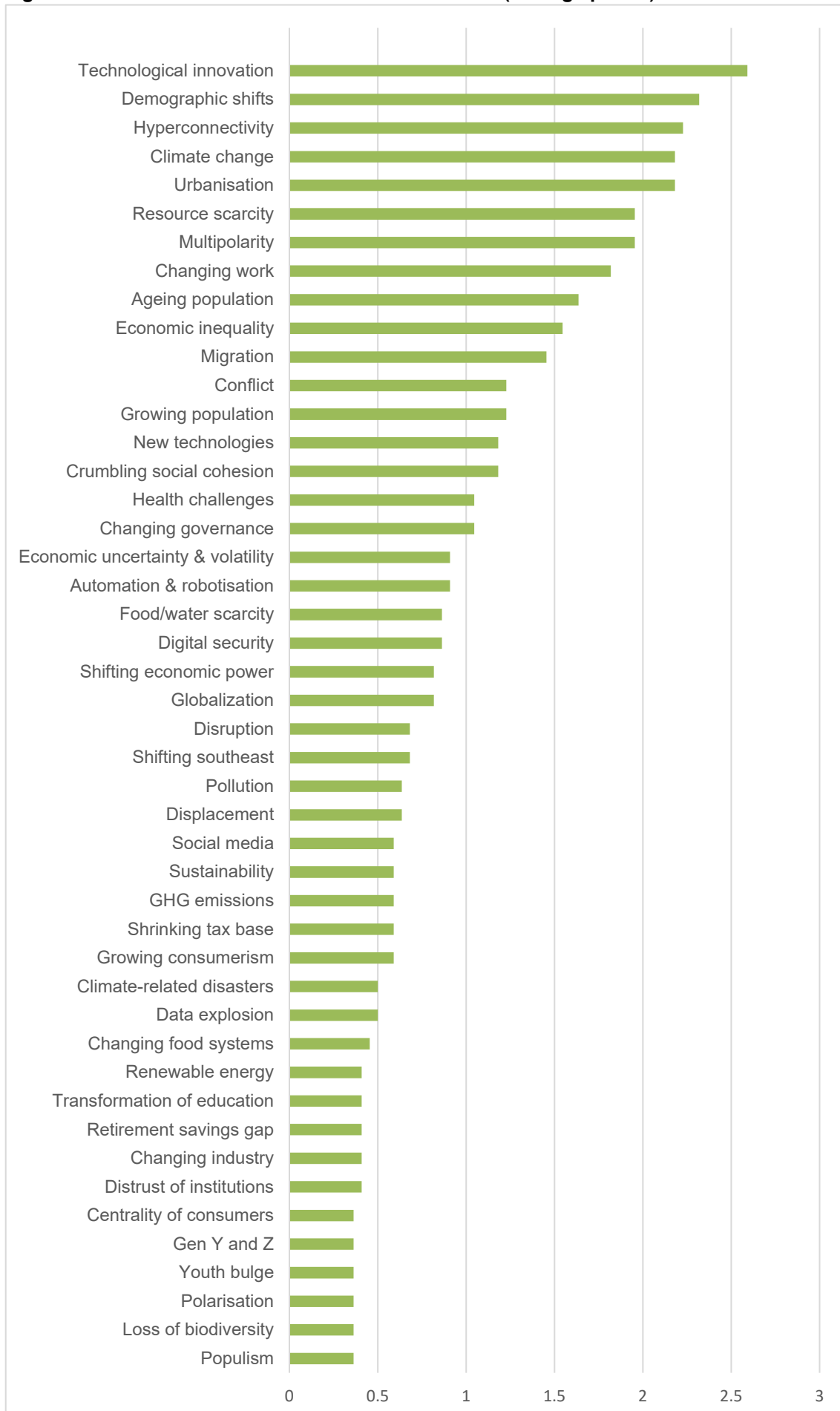
Using relative frequency was useful to understand the relevance of megatrends across sources. As an example, **Table 1** shows a comparison between the trend of 'Automation and Robotization' and that of 'Health Challenges'. When calculating the number of sources mentioning these as trends it is noticeable that 12 sources out of 22 mention 'Automation and Robotization' as a trend for the future, while only 11 out of 22 do so for 'Health Challenges'.

However, when adding the number of points assigned Health Challenges was assigned 23 points compared to the 20 of 'Automation and Robotization'. This is due to the fact that four sources specifically mention Health Challenges as a megatrend, thus being assigned three points. To obtain a value that would take into account this nuance between consensus and strength, we calculated the average (or "consensus") of the points assigned for each trend – in this example, Health Challenges gets 1 AVG point as opposed to the 0.9 of Automation and Robotization. This average helped in comparing and listing the trends, as visualized in **Figure 2**.

When dividing into clusters, and to make sense of the complexity surrounding these trends, the narrative becomes important in the division between megatrends and sub-trend. For example, Ageing Population is considered a sub-trend of Demographic Shifts, even if the average points consensus of the sources for the sub-trend Ageing Population is higher than for the megatrend Economic Inequality.

Table 1: Comparing trends relevance		
	Health challenges	Automation & robotization
Blackrock	2	2
Boumphrey & Brehmer	0	0
Deloitte	1	3
Dugarova & Gülasan (UNDP-UNRISD)	2	1
EEA	3	0
EU Commission	3	1
EYQ	2	2
FAO	3	0
Forum for the future	0	0
Laudicina et al. (AtKearney GBPC)	0	0
McKinsey & Company	0	2
OECD	0	1
Pano (BOND)	0	0
PWC	0	0
Retief et al.	2	0
Smiths Group	3	0
Sydney Business Insights	0	2
Trend One	1	1
UN DESA	1	0
Wall S. (HP)	0	2
Winston A. R. (MIT)	0	2
Z_punkt	0	1
Sum of points	23	20
Count of sources	11	12
AVG (consensus)	1	0.9

Figure 38: Consensus around trends in the literature (average points)





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For more information, or to comment on this paper, email the authors: Filippo Artuso and Irene Guijt at fartuso1@oxfam.org.uk or iguijt1@oxfam.org.uk

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