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5 **Global Sustainable Development Report**
6 **2023**
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10 Advance, Unedited Version
11 14 June 2023
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INFORMATION FOR MEMBER STATES AND STAKEHOLDERS

Background

Paragraph 85 of the outcome document of Rio+20 (“The Future We want”) lists functions for the high-level political forum on sustainable development (HLPF), including to “strengthen the science-policy interface through review of documentation, bringing together dispersed information and assessments, including in the form of a global sustainable development report, building on existing assessments”.

In July 2016, in the Ministerial Declaration of the HLPF, UN Member States agreed that the GSDR would become a quadrennial report drafted by an independent group of scientists (IGS) supported by a task team of six UN agencies (DESA, UNCTAD, UNDP, UNEP, UNESCO, and the World Bank). The members of the IGS were appointed by the Secretary-General (see Annex I for members of IGS).

The GSDR, which will be launched at the SDG Summit in September 2023, is meant to advance implementation of the Sustainable Development Goals (SDGs) and to serve as a major input to Member States’ follow up and review of the 2030 Agenda at the half-way point.

Preparation

The IGS undertook a series of consultations to collect regional and cross-disciplinary perspectives (see Annex II for consultations and partners). After preparing a draft, the IGS presented the report to the scientific community for a technical review. This review was generously coordinated by the International Science Council (ISC) and included reviewers from ISC as well as the World Federation of Engineering Organizations, the Global Young Academy, the InterAcademy Partnership, and the International Council for Philosophy and Human Sciences. For the full list of reviewers please see Annex III.

The GSDR is an independent report and while the IGS have considered all feedback from Member States and stakeholders, they have incorporated changes at their discretion. **The current draft is an advance and unedited version that is undergoing editing, factchecking, design, layout. The final version will be available in September 2023.**

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Executive Summary

Introduction

Transformations are possible, and inevitable. This report is an invitation to embrace transformations with the urgency needed to accelerate progress toward the SDGs. Four years have passed since the 2019 *Global Sustainable Development Report* (GSDR) was published and even then, the world was not on track to achieving the Sustainable Development Goals (SDGs). Since 2019, challenges have multiplied and intensified. The world has moved forward on some fronts, such as the deployment of zero carbon technologies as one of many climate mitigation strategies. Progress has been halted in many areas partly as a consequence of a confluence of crises – the ongoing pandemic, rising inflation and the cost-of-living crisis, and planetary, environmental and economic distress, along with regional and national unrest, conflicts, and natural disasters. As a result, overall progress towards the 2030 Agenda and the SDGs has been severely disrupted in the last three years, yet every inch of progress matters and counts.

Strive not for one, but for all securities. The resilience and well-being of planet, people, environment, and ecosystems are degraded. A better future does not rest on one source of security, but on all necessary securities, including geopolitical, energy, climate, water, food, and social security. Strategies to embrace transformations should therefore be based on the principles of solidarity, equity and well-being, in harmony with nature.

Working as a human collective, time and resources must be used as judiciously and effectively as possible. The world is changing at an accelerated rate. Halfway to 2030, there is an ever-greater urgency to build momentum, embrace solidarity, and speed up progress on the SDGs. To do that, decision-makers need to use time and resources —human, knowledge, financial, and institutional, among others— as judiciously and effectively as possible, and take a systematic and strategic approach to drive and accelerate transformations.

Embracing transformations to achieve the SDGs

This report provides a synthesis of the key transformative shifts needed across different entry points (human wellbeing and capabilities, sustainable and just economies, food systems and healthy nutrition, energy decarbonization with universal access, urban and peri-urban development, and global environmental commons), as well as a framework for understanding how those transformations may unfold over time. It also presents practical examples and tools for fostering leadership and enhancing human capacities to engage with the acceleration mindset required to achieve the SDGs – locally, nationally and globally. The report synthesizes existing knowledge to cover three overarching themes.

First, it highlights key transformations needed in different sectors and provides examples of interventions from the literature that has modelled different scenarios for SDG progress. It then provides a stylized model to help unpack and understand the transformation process over time and outline the roles of different levers in facilitating various stages of transformation through a systematic and structured approach. As history has shown, transformations are inevitable, and this report emphasizes that deliberate and desirable transformations are possible – and indeed, necessary.

Second, through a series of examples, the 2023 GSDR illustrates how transformations have been facilitated in the past and in recent times. This knowledge can incentivize and support strategic decision-making by different societal actors, both in terms of better conceptualizing and framing the desired transformations in their context and in the use of levers to enact transformations. The nature and process of transformations towards the SDGs will vary from context to context. Each context requires a critical appraisal, based on evidence of the most strategic approach to transformation in that setting. This must be implemented with a system of oversight and feedback loops to continually monitor implementation and progress, learn from experience, and make changes as needed. This report is not prescriptive but rather provides an illustrative framework that can underpin strategic actions for accelerating transformation.

Finally, the report outlines how the knowledge enterprise has to evolve to best serve transformation processes. This will be achieved by both generating knowledge from a broader spectrum of society and connecting that knowledge to decision-making in a more robust and inclusive manner. With all this, the Report is a tool that can be used to tap the potential of key strategic transformations for multiple SDGs, acknowledging their interlinkages.

The 2023 Global Sustainable Development Report has six chapters. Chapter 1, asks ‘where are we now?’ and, reflecting on where the world is at the halfway point to 2030, highlights the need for resilience and acceleration. Chapter 2 asks ‘where are we heading?’ and frames the future, from urgency to agency, reviewing new knowledge for understanding the interlinkages between the SDGs and international SDG spillovers. Chapter 3 focuses on ‘what needs to be done?’, reviewing scenario projections for the SDGs alongside key shifts and interventions to accelerate transformations through the six entry points introduced in the 2019 GSDR. Chapter 4 considers ‘how can it be done?’ with a framework that can guide strategic action. It unpacks the dynamics in different phases of transformations towards sustainable development, with examples from historical and recent experience. Chapter 5 is about the unifying role of science, the importance of knowledge from a broader spectrum of society, both in the production of socially robust science, and in connecting science to policy making. Finally, Chapter 6 is a call for action inviting a reflection on the steps ahead, to accelerate transformative action, improve the underlying conditions for transformation, and use science to drive the world forward.

Chapter 1. Half-way to 2030

At the half-way point of the 2030 Agenda for Sustainable Development, the world is far off track as shown in the figure which captures current SDG status. Without urgent course correction and acceleration, humanity will face prolonged periods of crisis and uncertainty – triggered by and reinforcing poverty, inequality, hunger, disease, conflict, and disaster. At a global level, the Leave No One Behind principle is at significant risk.

SNAPSHOT OF TRENDS IN SELECT TARGETS

GOAL	INDICATOR	DISTANCE FROM TARGET (2023)*	TREND OF SDG PROGRESS (2023)*	CHANGE IN TREND OF SDG PROGRESS BETWEEN 2020 AND 2023*
1 	1.1.1 eradicate extreme poverty		Limited or no progress	 Backward
	1.1.2 Implement social protection systems		Not progress but some work on track	N/A
2 	2.1.2 Achieve food security		Deterioration	 None
	2.2.1 End malnutrition (stunting)		Not progress but some work on track	 None
3 	3.1.2 Increase skilled birth attendance		Not progress but some work on track	 Backward
	3.2.1 End preventable deaths under-5		Not progress but some work on track	 Backward
	3.2.2 End measles epidemics		Limited or no progress	 None
	3.6.1 Increase vaccine coverage		Deterioration	 Backward
4 	4.1.2 Ensure primary education completion		Limited or no progress	 Backward
5 	5.1.1 Eliminate child marriage		Not progress but some work on track	 None
	5.1.2 Increase women in political positions		Not progress but some work on track	 None
6 	6.1.1 Universal safe drinking water		Limited or no progress	 None
	6.2.1 Universal safe sanitation and hygiene		Not progress but some work on track	 None
7 	7.1.1 Universal access to electricity		Not progress but some work on track	 Backward
	7.2.1 Improve energy efficiency		Not progress but some work on track	 None
8 	8.1.1 Sustainable economic growth		Deterioration	 Backward
	8.2.2 Achieve full employment		Limited or no progress	 None
9 	9.1.1 Sustainable and inclusive industrialization		Limited or no progress	 None
	9.2.1 Increase research and development spending		Not progress but some work on track	 Forward
	9.2.2 Increase access to mobile networks		Substantial progress on track	 None
10 	10.2.2 Reduce inequality within countries		Not progress but some work on track	N/A
11 	11.1.1 Ensure safe and affordable housing		Not progress but some work on track	 Forward
12 	12.2.2 Reduce domestic material consumption		Limited or no progress	 N/A
	12.1.1 Reduce fossil fuel subsidies		Deterioration	 Backward
13 	13.2.2 Reduce global GHG emissions		Deterioration	 None
14 	14.1.1 Ensure sustainable fish stocks		Deterioration	 N/A
	14.5.1 Conserve marine key biodiversity areas		Limited or no progress	 N/A
15 	15.1.2 Conserve terrestrial key biodiversity areas		Limited or no progress	 None
	15.4.5 Conserve mountain key biodiversity areas		Limited or no progress	 N/A
	15.5.1 Prevent extinction of species		Deterioration	 None
16 	16.1.1 Reduce road-traffic deaths		Limited or no progress	 Backward
	16.2.2 Reduce unreported detainees		Deterioration	 None
	16.6.1 Increase national human rights institutions		Not progress but some work on track	 None
17 	17.2.1 Implement all development assistance commitments		Not progress but some work on track	 Forward
	17.8.1 Increase internet use		Substantial progress on track	 None
	17.10.2 Enhance statistical capacity		Limited or no progress	 None

* Distance from target (2023) and Trend of SDG progress (2023) refer to latest reported trend information for the week ending data ending the visualization reflecting the visualization methodology for the Sustainable Development Goals (SDG) Progress Chart Technical Note: a more detailed data as of May 2023 from the 2023 global progress snapshot. Please note that information for indicators 11.1, 10.2.2, 15.1.1, 15.2.2 and 17.14.1 refers to the Sustainable Development Goals Progress Chart 2020.

* To capture the impact of the COVID-19 pandemic on SDG progress, a comparison of the trend assessment from the Sustainable Development Goals Progress Chart 2020 and the Trend of SDG progress (2023) are made with state indicators showing new start or moved progress.

N/A refers comparisons available due to: 1) lack of more progress than a sufficient data (2) indicator not included in the 2020 Progress Chart; or 3) indicator has changed between progress trends.

264 In 2019, the previous *Global Sustainable Development Report* found that for some targets
265 the global community was on track, but for many others the world would need to quicken
266 the pace.

267 In 2023, the situation is much more worrisome due to slow implementation and a
268 confluence of crises. For Goals where progress was too slow in 2019, countries have not
269 accelerated enough, and for others, including food security, climate action and protecting
270 biodiversity, the world is still moving in the wrong direction. In addition, recent crises
271 including the ongoing COVID-19 pandemic, cost-of-living increases, armed conflict and
272 natural disasters have wiped out years of progress on some SDGs including eradication of
273 extreme poverty. Progress has slowed down on targets including ending preventable deaths
274 under 5, vaccine coverage and access to energy.

275 These crises are not independent events: they are entwined through multiple
276 environmental, economic, and social strands, each fuelling the other's intensities.
277 Addressing interconnections was a starting point for elaborating the 2030 Agenda. This
278 Report shows how these interconnections offer opportunities to act in an integrated way to
279 release positive synergies and achieve the SDGs.

280 *The lingering drag of the COVID-19 pandemic*

281 The COVID-19 pandemic is still having a profound impact on progress toward the SDGs.
282 Beyond costing more than 15 million lives globally, it has slowed, disrupted, or temporarily
283 reversed progress across the SDGs. The pandemic resulted in losses of jobs, livelihoods,
284 incomes, and remittances. In 2022, the total hours worked globally remained two per cent
285 below the pre-pandemic level. The pandemic also exacerbated existing fault lines of
286 inequality. Some schooling went online, which was useful to many children but of no help to
287 families without broadband internet. And lockdowns did the greatest damage to small and
288 medium enterprises and the many women and temporary workers they employed.

289 Recovery from the pandemic has been uneven and incomplete. Quickest to bounce back
290 were the high-income countries which delivered more effective relief and had higher rates
291 of vaccination. In 2021, the top 20 per cent in terms of global income distribution had
292 recovered about half their lost income, but the bottom 40 per cent had not done so.

293 *Conflict, war and instability*

294 Compounding the effects of the pandemic is the highest level of state-based armed conflict
295 since 1945. By the end of 2020, around two billion people were living in conflict-affected
296 countries. In 2021, the number of refugees and internally displaced persons was the highest
297 on record at 89 million, and, for the first time, global military expenditure exceeded \$2
298 trillion.

299 The war in Ukraine is causing immense suffering and loss of life and triggering large
300 movements of people – while wreaking havoc in many parts of the global economy, and
301 driving up inflation, with huge spikes in the prices of food and energy. Besides the large
302 number of military casualties, as of Jan 2023, there have been tens of thousands of civilian
303 victims, 6,952 killed and 11,144 injured. There are more than 8.1 million refugees, most of
304 them women and children as well as 5.3 million people internally displaced in Ukraine.

305 Conflict and unrest are barriers to SDG progress in many countries beyond the war in
306 Ukraine, including in Afghanistan, Ethiopia, Venezuela, and the Sahel region of Africa among
307 others. Between March and May 2022, approximately 26.5 million people in the Sahel faced
308 a food and nutrition crisis.

309 *Inflation and the rising cost of living*

310 Between June and September 2022, around 89 per cent of the Least Developed Countries,
311 93 per cent of Landlocked Developing Countries and 94 per cent of Small Island Developing
312 States had food inflation above 5 per cent. Worst affected were the poor who often
313 responded by skipping meals or purchasing less nutritious food – short-term solutions that
314 imperil family health and damage the future prospects of children. Many countries face debt
315 levels at a 50-year high constraining options for investing in social protection that can help
316 people cope with rising costs.

317 **Chapter 2. Framing the future**

318 The world is far off track on achieving the SDGs at the halfway point on the 2030 Agenda.
319 But it is possible to actively improve future prospects for action and progress by 2030 and
320 beyond. Leveraging scientific knowledge, strengthening governance for the SDGs and
321 unleashing the full potential of the SDG framework for promoting sustainable development
322 can make this happen. SDG interlinkages, and international spill-overs and dependencies
323 must be systematically considered.

324 Uptake and governance using the SDGs has advanced in the last four years across sectors
325 and levels of government, despite urgent crises, which indicates the robustness and broad
326 acceptance of the framework. Yet, aspirations and commitments are not yet translating into
327 institutional change, action and implementation at a scale visible in SDG progress.

328 While many circumstances are making it more difficult to attain the SDGs, in some respects,
329 the prospects have improved. There is now a wealth of SDG-related knowledge and
330 evidence. More people and organizations have learned about the Goals and are thus in a
331 better position to put pressure on both governments and companies to operate more
332 sustainably.

333 A survey of 60 countries showed that by 2021, 75 per cent of governments had developed
334 SDG strategies and action plans. Many local governments have stepped up their efforts, by
335 developing Voluntary Local Reviews or other SDG strategies. International organizations and
336 institutions have widely adopted the SDGs and re-aligned their policy agendas. The private
337 sector is more engaged, through SDG-aligned business strategies, though there is the risk of
338 overclaiming and ‘SDG-washing’. Given the large SDG financing gaps for developing
339 countries, innovative financing solutions have been developed, the imbalance and injustice
340 in the international financial architecture are being called out, and there are strong calls for
341 its reform.

342 The SDG framework has enabled novel and more systemic perspectives for decision-making
343 on sustainable development, through new insights and science-based tools for considering
344 SDG interlinkages. While some general patterns of SDG synergies and trade-offs can be
345 observed, the scientific literature points to the context dependence of interlinkages. Local

and national actors can therefore gain a lot by using tools to identify positive and negative interlinkages in their context, and by undertaking ex ante SDG policy impact assessments.

The SDG framework allows for considering international dependencies and spill-overs between countries in their pursuit of sustainable development. Creating an educated and skilled workforce, for example, not only underpins national development in the educating country, but also, through temporary or permanent migration, spills over to the destination economies and communities – though this may be regretted by the educating country as a brain drain. An example of a generally negative spillover is carbon that is ‘embedded’ in the production of goods in one country that is subsequently exported to another. Better understanding and quantification of international spill-overs is urgently needed to inform and strengthen action for SDG 17.

Chapter 3: Pathways to achieve the SDGs

The Report reviews existing scenario projections for the SDG progress along various pathways. Generally, these indicate that on a business-as-usual pathway the SDGs will remain out of reach by 2030, or even 2050. Gains would be made in key areas including extreme poverty reduction and global and national income convergence. But progress would be minimal on targets relating to malnutrition and governance. At the same time the world would regress in air pollution and associated health impacts, agricultural water use, relative poverty rates, food waste, greenhouse gas emissions, and biodiversity and nitrogen use.

But business need not continue as usual. More ambitious sustainable development scenarios reveal that decisive action can deliver strong gains on the SDGs by 2030. For example, an ambitious ‘SDG-push’ scenario would improve social protection, strengthen governance, promote a green economy, and address digital disruption, while improving secondary education and science. By 2030, this could lift 124 million additional people out of poverty, with 113 million fewer people malnourished. It would also generate gains across other SDGs in health, nutrition and education. Nevertheless, there would still be gaps, indicating the need for truly transformative initiatives and game-changing interventions.

Entry points and levers for transformation

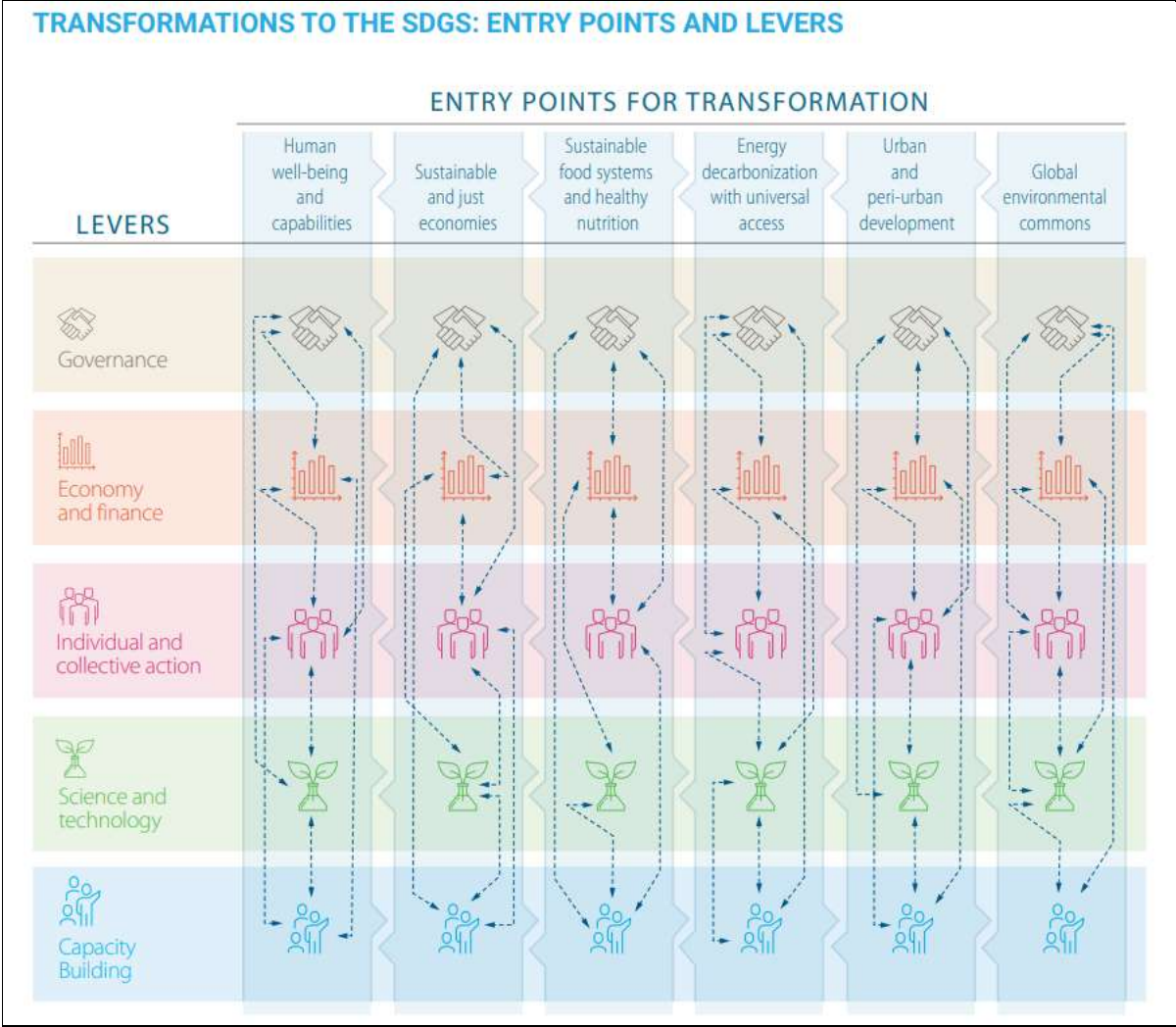
Increased ambition and transformative interventions are needed to accelerate progress towards the SDGs. Given the diversity of the Goals and targets, an integrated and coherent approach to implementation is needed.

The 2019 *Global Sustainable Development Report* put forward an organising framework of six entry points for transformation: human wellbeing and capabilities, sustainable and just economies, sustainable food systems and healthy nutrition patterns, energy decarbonization with universal access; urban and peri-urban development; and the global environmental commons. These are still crucial areas where actions can have impacts across the SDGs.

To achieve the SDGs operating through these entry points, the 2019 Report suggested deploying four ‘levers’ to bring about transformation in these entry points: governance, economy and finance, science and technology, and individual and collective action. This

Report adds a fifth lever, ‘capacity building’, as the development and or mobilisation of capacity is essential for the transformation process.

Supporting the transformation process entails enhancing capacity in all countries for strategic direction and foresight; innovation and the generation of new alternatives; orchestration, engagement and negotiation; identifying and overcoming impediments; and in learning and resilience.



Key shifts to accelerate progress

Aligning the framework of entry points and levers with evidence from ambitious global scenarios can inform integrated and transformative action.

The Report highlights important shifts needed across each entry point to accelerate progress towards the SDGs. It also provides examples of how specific policy, finance, technology, and behavioural changes could be combined to enable the necessary transformations. Capacity building to effectively deploy these levers will also be critical.

Transformative shifts for each entry point from global scenarios include:

402 *Human wellbeing and capabilities* - Scaling-up investment in primary health care and
403 ensuring access to lifesaving interventions, accelerating secondary education enrolment and
404 completion and ensuring all girls are enrolled, and increased investment in water and
405 sanitation infrastructure to deliver universal piped water access and halving of untreated
406 wastewater.

407 *Sustainable and just economies* - Encourage inclusive, pro-poor growth including progressive
408 redistribution measures, doubling welfare transfers in low-income countries, rollout of good
409 practice climate policies and global carbon pricing, encouraging lifestyles towards sufficiency
410 levels, investment in green innovation, and circular and sharing economy models.

411 *Sustainable food systems and healthy nutrition* - A mix of supply side measures improving
412 affordability, increasing yields sustainably while reducing inputs and negative impacts, and
413 more sustainable and efficient measures in retailing, processing and distribution, as well as
414 measures on the demand side, most importantly shifting towards healthier and more
415 diversified diets, and reducing post-harvest losses and food waste.

416 *Energy decarbonisation and universal access* - The large-scale deployment of renewables
417 and best available technologies, appliances and equipment, rapidly scaling up infrastructure
418 investment and support for universal electricity access and clean cooking alternatives,
419 phasing down of fossil fuels by 2030 in a domestically and globally just manner, major
420 changes in global consumer behaviour to reduce energy consumption, and end-use
421 electrification.

422 *Urban and peri-urban development* - Doubling the recycled and composted share of
423 municipal waste by 2030 and a more circular waste cycle, more use of electrical vehicles,
424 better public transport with cities' infrastructure oriented to people and pedestrians and
425 not cars, and good-practice policies for transport, buildings and waste.

426 *Global environmental commons* - Expanding protected areas, abandoning intensive
427 agricultural practices in protected areas, ambitious reforestation of all degraded forest
428 areas, shifting societal preferences towards conservation land use, reducing water
429 consumption and ensuring environmental flow requirements, and adopting a 1.5°C land-
430 sector roadmap combining ambitious protection, conservation, restoration and lifestyle
431 changes.

432 *Common impediments to transformation*

433 Scenario projections reveal that a lot can be practically done to accelerate progress towards
434 the SDGs through new policies, technologies, investments, and behaviours. However, a
435 range of common impediments can derail these actions.

436 Deficits in governance, institutional capacities, financing and infrastructure hamper progress
437 in many countries. Lock-ins can result from high upfront capital costs, immaturity of
438 technologies and markets, gaps in financing, and large sunk investments that create
439 resistance to change. Political feasibility can be undermined by influential actors and vested
440 interests and concerns about potential trade-offs for jobs and livelihoods. Engrained
441 practices and behaviours can be very difficult to change.

Faced with these impediments, it is critical to build understanding not only on ‘what’ needs to be done but also ‘how’ systems change can happen. Transformations typically take time to unfold and move through different phases which face different impediments changing what is needed from different actors. Each country has its own challenges, priorities, needs and capabilities. Nevertheless, many countries follow similar pathways towards the SDGs and face common barriers and impediments.

Chapter 4. Accelerating transformations to the SDGs

Transformation is inevitable but its course, directions and speed are not. Change can and must be steered in positive directions by human determination. Goals matter in this regard. Over the last 200 years, human societies have produced many rapid and profound transformations – in human rights, for example, economic activity, health, technology and living standards.

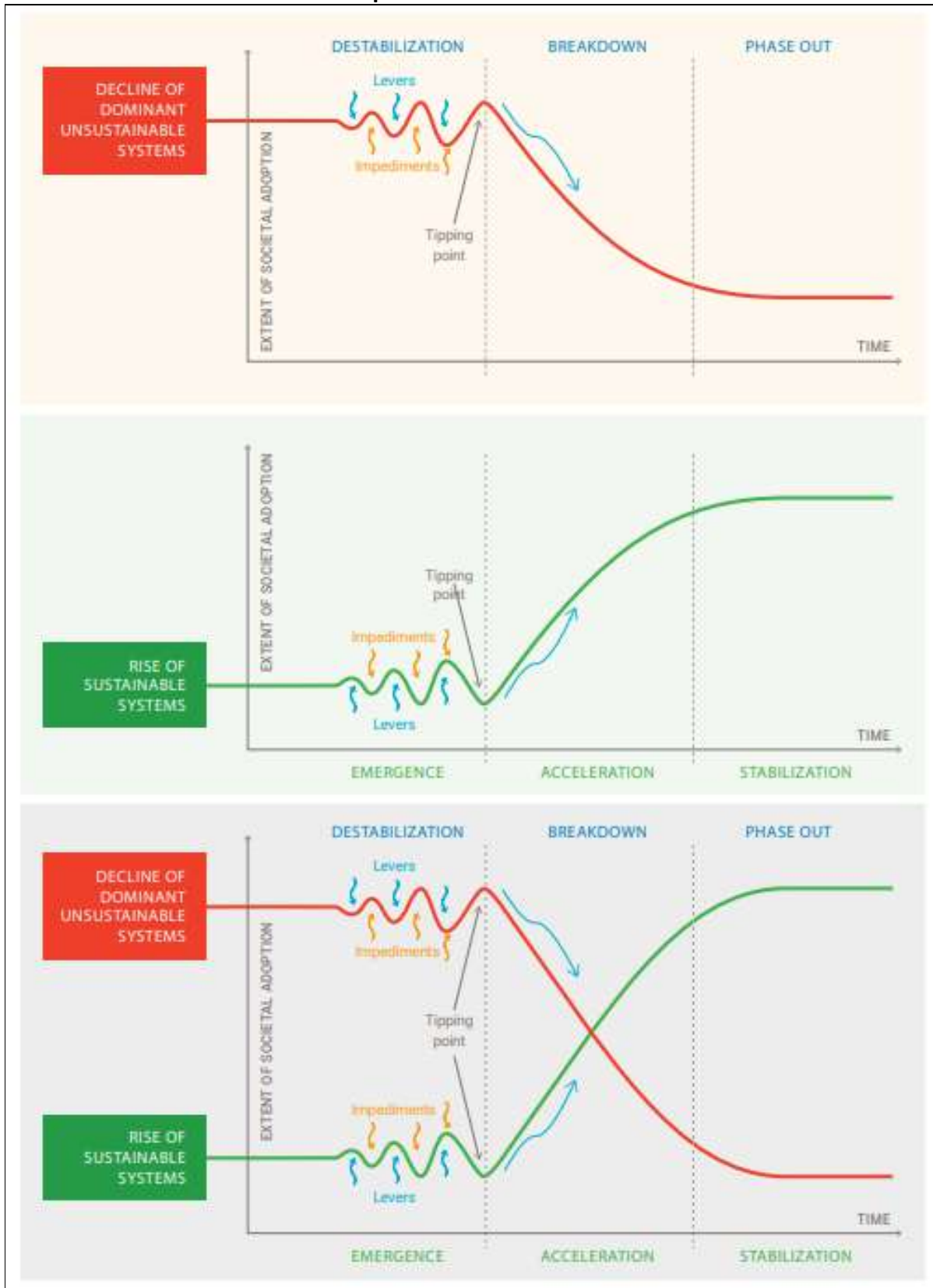
One major intervention was the Green Revolution which used high-yielding crops along with fertilizers and irrigation to transform agricultural systems. However, the Green Revolution also offers a cautionary tale. Crop yields rose rapidly, food consumption increased, and undernutrition plummeted. But the Green Revolution was often divisive, leaving many smallholders behind, excluded by inequitable land distribution, poor tenancy rights, and lack of access to credit. Women farmers were especially disadvantaged. Intensive, chemical-heavy farming also affected soils, water, biodiversity, and nutrition. The Green Revolution illustrates the importance of a whole-of society approach, weighing up positives and negatives to optimize human wellbeing while safeguarding the planet.

S-curve nature of transformations

This Report provides a stylized model to help unpack and understand the transformation process through a systematic and structured approach, suggesting that a successful transformation can be considered in three phases – emergence, acceleration and stabilization – tracing an S-curve. During the first, emergence phase, innovative ideas give rise to new technologies and practices – often operated in niches through experimentation and learning. The concept of innovation in this report includes technological, organisational, institutional, behavioural and social innovations. If successful, during the second, acceleration phase innovations expand and reach tipping points beyond which they are widely shared and adopted, leading to rapid, non-linear growth. Finally, in the third, stabilization phase these technologies and practices become pervasive in daily life as the new normal.

S-curves work in both directions. Progress in one area is typically mirrored by a decline in others, with three corresponding phases: destabilization, breakdown and phase-out. For example, the rise of renewable energy systems or electrified transport is being matched by the decline of fossil-fuel energy and internal combustion vehicles. Ambitious public policies are crucial for pushing innovation and change and for ensuring that old and new structures do not co-exist too long, in order to harvest the benefits of transformation towards sustainability as quickly as possible.

Three phases of transformation



483

484 Along this trajectory, innovations evolve – typically becoming cheaper and more effective as
 485 they are embedded with other complementary institutions, norms, technologies and
 486 infrastructure. Governments can also accelerate progress through targeted investments,

487 policies and incentives that promote innovation and adoption. These can effectively push
488 innovations across tipping points beyond which they are rapidly adopted.

489 However, sustainable transitions can also fail or veer off along undesirable pathways. This
490 might, for example, be the result of lock-ins to old technologies and practices, political
491 opposition or backlash from vested interests or affected communities, stubborn social
492 norms and behaviours that are difficult to change, or gaps in human, financial and
493 institutional capacities or supporting infrastructure.

494 *Enabling transformations through emergence, acceleration and stabilization*

495 As transformations evolve across the S-curves, countries can minimise impediments by
496 creating supportive technological, social and political conditions aligned to the different
497 phases. They can also work to build trust and consensus, provide finance, and safeguard
498 against undesirable consequences. This will require bold leadership, a shared vision and
499 direction, collective effort using the levers in a coordinated way, and mutual accountability.

500 *Emergence (destabilisation) phase* - In the emergence (or destabilisation) phase,
501 deliberative processes to collectively build common narratives, visions and missions will be
502 important. Governments, multilateral development banks, private finance, philanthropists
503 and others will need to support innovation and the piloting, prototyping and
504 implementation of new knowledge. Governments can also send clear market signals for
505 investment and adoption through credible long-term policies and targets. Capacities are
506 needed to innovate and generate sustainable alternatives and provide informal and
507 protected spaces for innovation and dialogue.

508 *Acceleration (break down) phase* - Decisive action by governments is often needed for
509 transitions to cross tipping points to the acceleration (or break down) phase. Building on
510 efforts in the emergence phase, proactive and decisive governments can shape markets by
511 stimulating research and innovation, investing in public infrastructure, setting targets,
512 standardisation, and regulating businesses. This can reorient economic activities towards
513 the SDGs.

514 Conflicts, tensions and political struggles are common during acceleration, as different
515 actors, interests and coalitions seek to promote or delay the transition for various reasons.
516 These reasons may include perceived trade-offs between competing SDGs or negative
517 outcomes for local jobs and livelihoods. A coherent mix of policies will be needed to ensure
518 just transitions where no one is left behind.

519 Individual and collective action through social movements and coalitions, changing
520 narratives and norms, maturing technologies, and crisis events can provide the critical
521 impetus needed for governments to take decisive action to accelerate transitions. For
522 governments facing strong opposition, early interventions or 'small wins' can build political
523 momentum for later more difficult and transformative measures.

524 *Stabilisation (phase out) phase* - During the stabilisation (or phase out) phase, innovations
525 can saturate markets and achieve widespread dissemination and use, becoming anchored in
526 infrastructure, regulations, user habits and standards. However, for stabilisation to take
527 root, new institutions and infrastructure must be resilient. Unless reforms are

528 institutionalised, the whole process may break down if leaders are unable to sustain
529 momentum or leave office. Sustaining momentum requires a strong tax and revenue base,
530 commitment of ongoing human and financial resources, maintaining political support, and
531 building institutional capacities for implementation.

532 Governments and the private sector can support a managed decline and phase-out of
533 unsustainable technologies and practices. Unintended consequences such as job losses or
534 the decline in regional industries and economies can be mitigated through government
535 support for affected workers such as compensation, social safety nets, reskilling and
536 training, and alternative employment opportunities. These measures will help to reduce
537 resistance, increase public acceptance and ensure a just transition with fair outcomes for all.

538 **Chapter 5. Transformations through science—and in science**

539 Transformations to sustainable pathways should be rooted in science. The scientific
540 method, based on observation and testing hypotheses, reduces uncertainty, identifies
541 tipping points, accelerates the uptake of innovations and lays the foundations for the next
542 frontier of ideas. This Report argues for science that is multidisciplinary, equitably and
543 inclusively produced, openly shared, widely trusted and embraced, and ‘socially robust’ —
544 relevant to society.

545 A few decades ago, the “science-policy interface” primarily involved experts in individual
546 scientific disciplines – usually in the Global North, and predominantly white male. For
547 sustainable development in the 21st Century, science-policy interactions will need to be far
548 more multi-directional and multi-disciplinary – and expanded to a ‘science-policy-society’
549 interface.

550 It is clear, though, that the current platforms and intermediaries are not sufficient. Civil
551 society organizations (CSOs), Non-governmental organizations (NGOs), think tanks and
552 other institutions can be powerful advocates for change, and can promote accountability.
553 While young people and CSOs are starting to be included in the global processes and
554 platforms, they are still often excluded from the actual decision making. Young people,
555 those who have the biggest stake in the future, are particularly compelling messengers and
556 leaders, and should be further empowered.

557 *Global imbalance in research and development*

558 To be relevant to the SDGs, more scientific activity should be conceived and produced
559 outside of high-income countries. Current imbalances severely curtail the capacity of many
560 low- and middle-income countries to attain the SDGs by generating context-specific
561 solutions in their region.

562 As well as making the production of science more inclusive and geographically diverse, it is
563 also crucial to ensure that once science is produced, the resulting knowledge is widely
564 accessible. Public interest groups, policymakers, industry and teachers should have free
565 access to the relevant publications, data and software. This is especially important for SDG
566 issues, and for research that has been publicly funded. In the humanities, for example, the
567 digitization of historical documents across continents has allowed students and citizens to

568 gain first-hand understanding of key moments in history—struggles for independence,
569 human rights movements, and social progress that can be instructive for current challenges.

570 *Trust and Integrity*

571 A major hurdle for science is the speed of publication. Producing unbiased, peer-reviewed
572 information absorbs time and money, giving some platforms, particularly social media, a
573 head start for promulgating false information. Influencers and propagandists, with little or
574 no expertise, can nevertheless create compelling stories and catchy headlines that appear
575 factual and elicit strong emotional responses. And, because of social media algorithms,
576 people rarely see posts that contradict their own biases and preferences. This echo chamber
577 effect is having a profound impact on the political landscape, with increased polarization
578 and partisanship and lower levels of trust in governments and science.

579 The world has responded to the proliferation of fake news with comprehensive
580 countermeasures. In 2022 around 400 teams of journalists and researchers in 105 countries
581 were working on tackling political lies, hoaxes and other forms of misinformation. To help
582 scientific health evidence keep pace with fake news for COVID-19, WHO gathers real time
583 information on how people are talking online about the pandemic and had released tips to
584 identify mis- and dis-information and is aiming to ensure the top results on the pandemic
585 are official science-based sources.

586 *Socially robust science*

587 There is inevitably a time lag between the publication of scientific evidence, public policy
588 decisions, and full implementation of science-based recommendations. Sometimes, the gap
589 is created by a lack of political will or lobbying and disinformation by vested interest groups.
590 Sometimes, action is simply impossible because of political unrest and conflict, or the lack of
591 financial resources. Consider climate change, the IPCC has reached clear conclusions, but
592 the world is still failing to reduce the global carbon footprint.

593 Achieving the SDGs requires broader societal engagement with all aspects of science and a
594 greater democratization of knowledge – so that people will be ready and willing to commit
595 to the transformations needed.

596 **Chapter 6. Calls to action**

597 Implementation of the Agenda 2030 requires the active mobilisation of political leadership
598 and ambition, and building societal support for policy shifts embracing transformations
599 through meaningful consultation with stakeholders and effective participation.

600

601 Transformation is possible, and inevitable. To guide policymakers in this process, the Report
602 presents a series of calls to action. First, it proposes that, at the midpoint to the 2030
603 Agenda, the United Nations Member States elaborate a shared SDG Transformation
604 Framework that consists of six elements: (i) national plans of action to counter negative
605 trends or stagnation in SDG implementation; (ii) local and industry specific planning to feed
606 into national plans; (iii) initiatives through the Addis Ababa Action Agenda or otherwise to
607 increase fiscal space, including tax reforms, debt restructuring and relief, and increased
608 engagement by international finance institutions for SDG implementation; (iv) investment in

SDG related data, science-based tools and policy learning; (v) partnerships to strengthen the science-policy-society interface; and, (vi) measures to improve accountability of governments and other stakeholders.

Second, it recommends building capacity for transformation at individual, institutional and network levels, to strategize, innovate, manage conflicts, identify and overcome impediments and cope with crises and risks. Third, it puts forward key synergetic interventions in each of the six entry-points for sustainability transformation, to achieve coherence and equity, and ensure that advances in human wellbeing are not made at the expense of climate, biodiversity and ecosystems. Fourth, it proposes five measures for improving the fundamental conditions for implementation, namely by investing in conflict prevention and resolution, enhancing fiscal space, supporting marginalised groups, taking advantage of the digital transformation and by investing in gender equality. Finally, it recommends tools for transforming science and approaches to ensure that science, policy and society work together for a future where people and nature can thrive as one.

This report bridges science and practice to provide actionable knowledge, practical tools, and examples for a variety of actors, from policymakers in United Nations Member States to youth and community groups, from financiers to other industry partners, from donor agencies to philanthropies, and from academics to civil society groups. The 2023 Global Sustainable Development Report benefited from inputs received from experts from a wide range of disciplines - natural scientists, social scientists, policy makers, and practitioners - in response to an open call for inputs, a scientific peer review led by the International Science Council, as well as region-specific inputs gathered through a series of regional consultations held in Australia, China, Japan, Malawi, Peru, Philippines, Qatar, and Senegal. Achieving the SDGs is not only the work of governments, and the contributions from multiple actors are essential indeed. This report is for all stakeholders, with the recognition that everyone will engage with these transformations in some way, and for doing so effectively, everyone will need strategies and tools.

Chapter 1: Half-way to 2030 – progress towards the SDGs

In 2015, United Nations Member States agreed on the 2030 Agenda for Sustainable Development and the 17 associated Sustainable Development Goals (SDGs) – as a universal call for action to end poverty and protect the planet. But today at the half-way point, the world is not on track to achieve the SDGs by 2030, and we are more off track than four years ago. This is a warning signal that unless the world makes an urgent course correction and initiates transformative change, we risk undermining advances made, increasing vulnerability to future crises and cementing unsustainable development pathways.

In 2015, the global community adopted a shared blueprint for people, planet, peace, prosperity and partnership, the 2030 Agenda for Sustainable Development, and established an ambitious set of interlinked Sustainable Development Goals (SDGs). The SDGs cover all regions of the world in all aspects of life and development – in health, education, and the environment, peace, justice, security, and equality. They aim to eliminate poverty and hunger, tackle diseases to ensure healthier societies and wellbeing, empower women and girls and tackle the triple planetary crisis of climate change, biodiversity loss and pollution.¹
² Achieving the SDGs would be a monumental step forward but will demand determination and effort from citizens in every country, shared responsibility of governments and global solidarity.

The big picture: stagnation in the face of multiple crises

The 2019 *Global Sustainable Development Report* (GSDR) assessed progress on the SDGs. The indications were not encouraging. That Report concluded that on the current trajectory the world was unlikely to achieve the SDGs by 2030. It found that for some targets the global community was on track, such as those for child mortality and for primary school enrolment. And to meet many other targets, the world would need to quicken the pace – particularly for eradicating poverty and hunger, reducing maternal mortality, increasing access to drinking water and sanitation, and achieving gender equality. More worrying still, in some respects the world was slipping backwards – regressing on climate action and biodiversity, for example, and on reducing inequality.

In 2023, halfway to 2030, the situation is much more dire.

Figure 1-1, with an assessment of select targets with sufficient data, shows that SDG targets close to being achieved are the exception rather than the rule³. As shown in the column *Distance from Target*, the SDG targets close to being achieved include increasing skilled birth attendance (3.1.2), full employment (8.5.2), raising industry's value to GDP (9.2.1), access to mobile networks (9.c.1) and access to internet (17.8.1). However, in many of these, progress is not fast enough, as shown in the column *Trend of SDG Progress*.

Most other targets are either at a moderate distance to the goalpost or far from it as shown in the column *Distance from Target*. Based on the targets for which we have data available, particularly far from the reaching the 2030 ambitions are goal 2, goal 11, goal 13, goal 16 and goal 17.



679 Source: Calculations based on Sustainable Development Goals Database <https://unstats.un.org/sdgs/dataportal>

680 To capture impacts of recent crises on SDG progress, Figure 1-1 also shows a comparison of
681 trends for each target, as assessed in 2020, with trends in 2023 (see column *Change in Trend*
682 *of SDG Progress between 2020 and 2023*). SDG targets that were on track and remain on
683 track are access to mobile networks (9.c.1) and internet access among individuals (17.8.1)
684 (indicated by None).

685 The analysis shows a worsening trend across many of the SDGs between 2020 and 2023
686 (indicated by Backward). The target on ending extreme poverty (indicator 1.1.1), which saw
687 steady progress through 2018/2019, has been disrupted by a multitude of recent crises.
688 COVID-19 pushed tens of millions into poverty. While poverty is again on the decline, the
689 recent spate of cost-of-living and climate crises, among others, mean that poverty reduction
690 is now on a much slower path. On several other targets where there was good progress in
691 2018/2019, the progress has now slowed down. These include skilled birth attendance
692 (3.1.2), under five mortality rate (3.2.1), vaccine coverage (3.b.1), primary education
693 completion (4.1.2), access to electricity (7.1.1), GDP growth (8.1.1), addressing fossil fuel
694 subsidies (12.c.1), and reducing homicide rates (16.1.1).

695 For Goals where progress was too slow in 2019, in most cases, countries have not
696 accelerated enough. On some SDG targets, however, progress is now faster than it was in
697 2018/19 (indicated by Forward). These include increasing research and development
698 spending (9.5.1), safe and affordable housing (11.1.1), and implementation of ODA
699 commitments (17.2.1).

700 Other targets were moving backward and continue to regress, including achieving food
701 security (2.1.1), reducing global GHG emissions (13.2.2) and preventing the extinction of
702 species (15.5.1). Since 2015, the number of people living in hunger and food insecurity is on
703 the rise. The situation is getting worse. On Stunting, progress had been made since 2015
704 though full impacts of the pandemic on child nutrition may take years to manifest⁴.

705 Where progress has been halted or slowed down, it is partly a consequence of a confluence
706 of crises – the ongoing pandemic, rising inflation and the cost-of-living crisis, and planetary
707 environmental and economic distress, along with regional and national unrest, conflicts, and
708 natural disasters. To have these crises overlap so relentlessly might seem bad luck, but they
709 are not independent events: they are entwined through various physical, economic, and
710 social strands, each fuelling other's intensities.⁵ For example, climate change fuelled
711 fluctuations in transboundary fish stocks is causing international and regional tensions (Box
712 1-1). Climate change is causing water stress and food insecurity, altering marine, terrestrial
713 and freshwater ecosystems, harming biodiversity, destroying livelihoods, and widening
714 inequalities. These worsening prospects in turn intensify ideological extremism, fuelling
715 tensions and conflict.

716 **Box 1-1: Challenges of managing transboundary ocean resources in an era of Climate change⁶**

717 Indirect effects of climate shifts can be felt across borders through disruptions in supply chains, markets and
718 the movement of natural resources. Transboundary risks to the water, energy and food sectors have been
719 projected as a result of extreme weather and climate events⁷. Globally, 633 (68 per cent) of assessed
720 commercial marine stocks are estimated to be transboundary resources⁸. By 2030, it is predicted that about 23
721 per cent of transboundary stocks of marine fish and invertebrates will shift due to climate change.⁹ Changes in
722

species distribution across borders introduces challenges for biodiversity governance¹⁰, with implications for security and stability.¹¹ Further complications are introduced by a lack of sufficient data and institutional mechanisms to accurately track these shifts.¹² For example, in Southeast Asia, there are transboundary concerns about fisheries and marine area management. Prior to the establishment of exclusive economic zones (EEZs), the shallower areas within archipelagic waters of what is now known as the Coral Triangle were accessible to all Southeast Asian fishers. Each country had traditional fishing grounds, shaped by local and indigenous knowledge, some of which extended outside EEZ boundaries. The establishment of EEZs resulted in overlapping claims and tensions among fishing communities in Southeast Asian nations. There has also been a high frequency of illegal, unreported and unregulated (IUU) fisheries. IUU fisheries contribute to the loss of biodiversity, mismanagement and in some cases the deployment of military units to secure contested territorial claims. Climate change can be expected to exacerbate existing tensions. Regional mechanisms for fisheries management could help alleviate these challenges; for instance, the establishment of an Association of Southeast Asian Nations (ASEAN) nations regional fisheries management organization, focusing on shallow waters that host commercially important and exploited demersal species.

On the other hand, the inter-connections between economies and people, including those across national borders could be exploited to release positive synergies (Box 1-2). Accelerating progress on the SDGs in a holistic and integrated way could help recover from these crises and reduce future systemic risks.

Box 1-2: Harnessing migration for the SDGs

When well-governed, migration can contribute to alleviating poverty and inequality and advancing sustainable development. With over 281 million estimated to be international migrants in mid-year 2020¹³, and 38 million newly internally displaced in 2021¹⁴, ensuring safe, orderly and regular migration can contribute to positive development outcomes at all levels.

For example, remittances are a critical source of financial support for families and communities. Remittances proved resilient despite COVID-19, reaching USD 605 billion in 2021 and overtaking FDI and ODA to low- and middle-income countries excluding China¹⁵—providing people with paths to improved livelihoods. Migrant workers in essential sectors kept many economies afloat during the COVID-19 pandemic, including migrant workers in healthcare sectors who provided support at the frontline of the pandemic response in many countries.

There are examples across regions of initiatives to make migration work for sustainable development. In Serbia, Municipal Youth Offices in three rural towns facilitate technical trainings for young people to learn skills that local businesses need, and to directly connect the young people with education-to-employment pathways in local companies.¹⁶ In Morocco, a CSO orients vulnerable women and children, including irregular migrants, to psycho-social support and local healthcare services.¹⁷ In Ecuador, municipal authorities have implemented an online marketplace, job banks and physical co-working spaces and provide trainings for local companies on inclusive hiring practices.¹⁸

With the right enabling tools, migration can help fulfil the aspirations of those on the move and the societies they join, as well as those who stay behind. To reduce inequalities in terms to access to travel and immigration processes, regular pathways for migrants need to be reinforced and made safe, and accessible immigration channels need to be ensured.¹⁹ Strengthened data and capacities to measure the implementation of migration aspects in the SDGs are also needed to better understand mobile populations, whose data are often not included in official statistics.

At the same time, forced displacement is a human crisis that should be prevented from happening. States must take measures to protect and assist their citizens who are displaced within their own countries as internally displaced persons (IDPs) and to provide asylum and protection to refugees when people are forced to cross borders.

771 This chapter examines the state of the SDGs today, while Chapter 2 assesses future prospects
772 for achieving the SDGs.

773 *The lingering drag of COVID-19*

774 Around the globe, the COVID-19 pandemic is still having a profound impact on the mental
775 and physical health and wellbeing of individuals, households and communities worldwide.
776 Beyond costing more than 15 million lives globally, it has slowed, disrupted, or temporarily
777 reversed progress across the SDGs.²⁰ The pandemic has at times shut down entire
778 industries, from travel and tourism to entertainment and retail, with a loss of jobs,
779 livelihoods, incomes, and remittances. In 2022, because of the loss of jobs and many people
780 leaving the labour force, the total hours worked globally remained two per cent below the
781 pre-pandemic level.²¹ The pandemic also cast a large shadow over the lives and future
782 prospects of children, particularly through the closure of schools, and added to women's
783 burden of care work²².

784 The pandemic exacerbated existing fault lines of inequality. Much of schooling went online,
785 which was useful, but inferior to classroom interactions and socialization while being of no
786 use at all to families without access to devices or broadband internet – widening the gaps
787 between richer and poorer students.²³ There was also an increase in economic disparities.
788 As economies shrank and many services and goods dried up, the impacts were greatest on
789 small and medium enterprises (SMEs) and on the many women and temporary workers they
790 employ.²⁴ During the lockdowns, migrants who faced more restrictions and had less access
791 to relief measures were some of the most affected workers.²⁵

792 Recovery from COVID-19 has been very uneven and incomplete. Quickest to recover were
793 the high-income countries who generally achieved higher rates of vaccination and could find
794 more effective relief measures.²⁶ In 2021, the top 20 per cent in terms of global income
795 distribution had recovered about half their lost income, but the bottom 40 per cent had not
796 recovered.²⁷ The high-income countries also resumed education more rapidly, bringing
797 students back into classrooms and enabling parents to get to work. By end of Feb 2022, 42
798 countries had opened schools only partially and six countries still had schools fully closed²⁸.
799 This uneven recovery does not just affect those countries that are slowest to recover.
800 National economies are now so interconnected through trade and migration that delayed
801 recoveries in any country reduces the prospects for all.²⁹

802 Informality and working poverty rose because of the pandemic. The incomplete recovery
803 implies an ongoing shortage of better job opportunities, pushing workers into jobs of worse
804 quality³⁰.

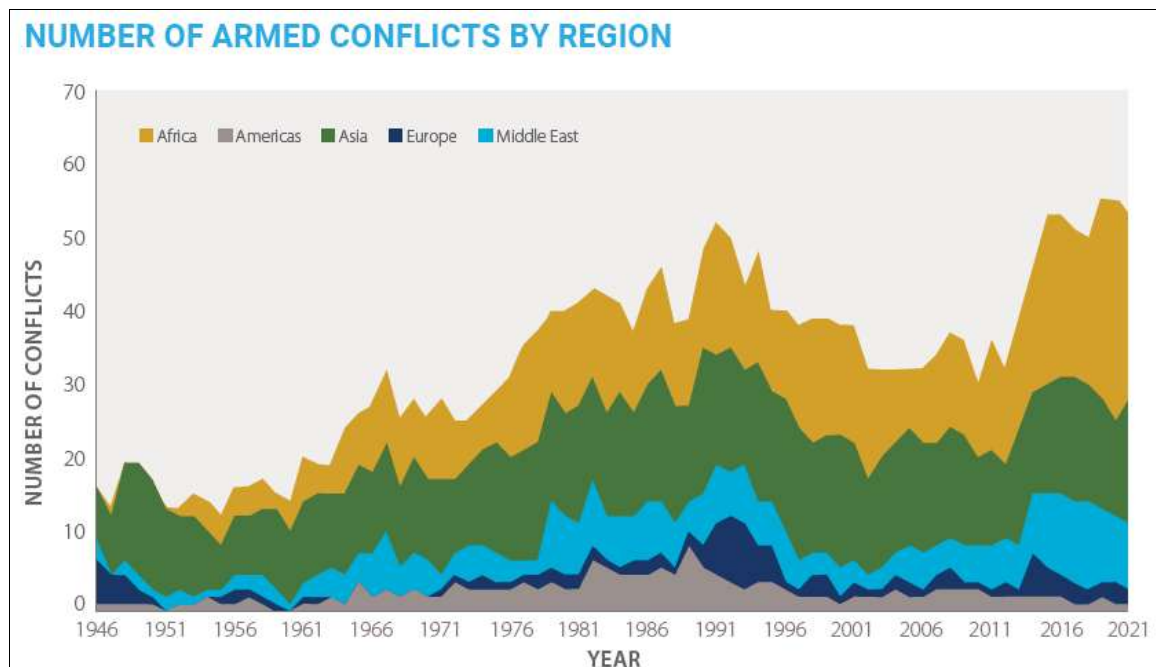
805 The pandemic also had detrimental environmental impacts including through the
806 heightened use of plastic in medical use such as personal protective gear, and through the
807 postponement of vital global environmental governance negotiations scheduled for 2020³¹.

808 *Rising levels of conflict war and instability*

809 The world is currently witnessing the highest level of state-based armed conflicts seen since
810 1945. By the end of 2020, around two billion people were living in conflict-affected
811 countries³². In 2021, the number of people who were forcibly displaced was the highest on

record, at 89.3 million with 27.1 million refugees and 53.2 million internally displaced people.³³ There is also a deeply concerning long-term trend of an increasing number of armed state-based conflicts as well as non-state conflicts³⁴ (see figure 1-2).

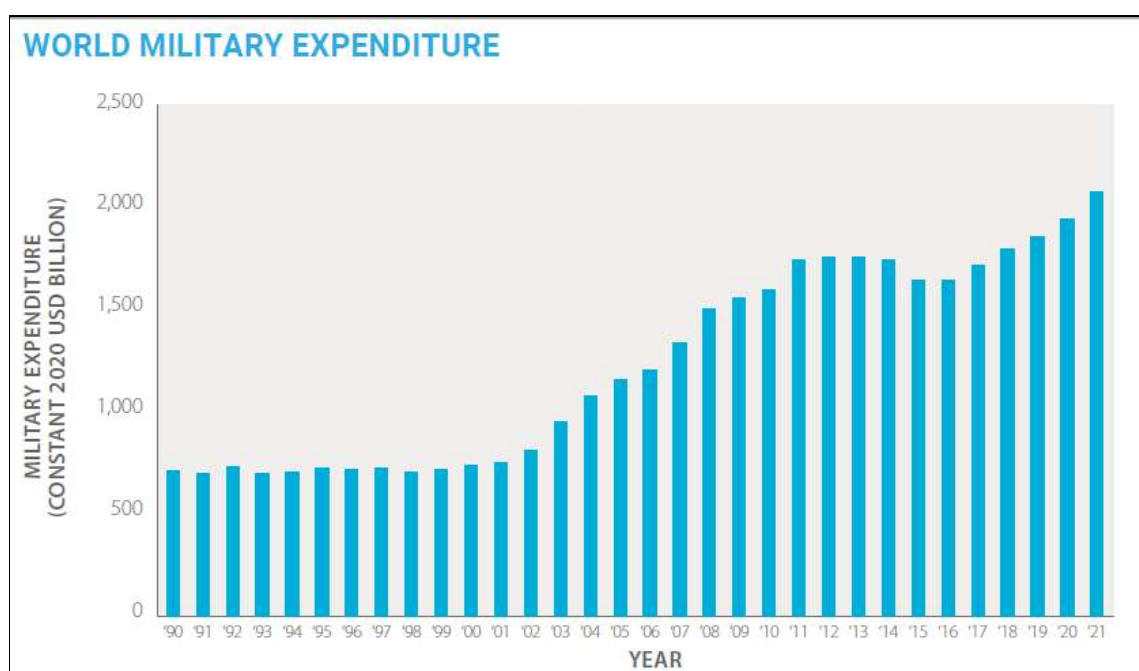
Figure 1-2: Number of armed conflicts by region



Source: <https://ucdp.uu.se/downloads/charts/>. Davies, Shawn, Therese Pettersson & Magnus Öberg (2022). Organized violence 1989-2021 and drone warfare. *Journal of Peace Research* 59(4).

By 2030, up to two-thirds of the world's extreme poor could live in settings characterized by fragility, conflict and violence threatening efforts to end extreme poverty. Conflicts also drive 80 per cent of all humanitarian needs³⁵. Violent conflict not only disrupts human development and causes insecurity, it also destroys man-made and natural capital and diverts private and public resources to spending on defence and reconstruction. In 2021, for the first time, global military expenditure exceeded \$2 trillion³⁶ (figure 1-3).

Figure 1-3: World military expenditure



Source: SIPRI Yearbook

Conflict forces people to flee their homes. And 2021 was the deadliest year on record for migrants since 2017, with nearly 6,000 people dying as they fled their countries through often dangerous routes.³⁷ The economic, health and social impacts of conflict and forced migration are highly gendered, meaning that women, men, and sexual minorities face different risks and experiences before, during, and after migration³⁸. Sexual violence and exploitation and the risk of being trafficked are all too common among women and children fleeing war or persecution. Many humanitarian aid workers and health professionals are not adequately trained to identify these risks and provide services and support³⁹.

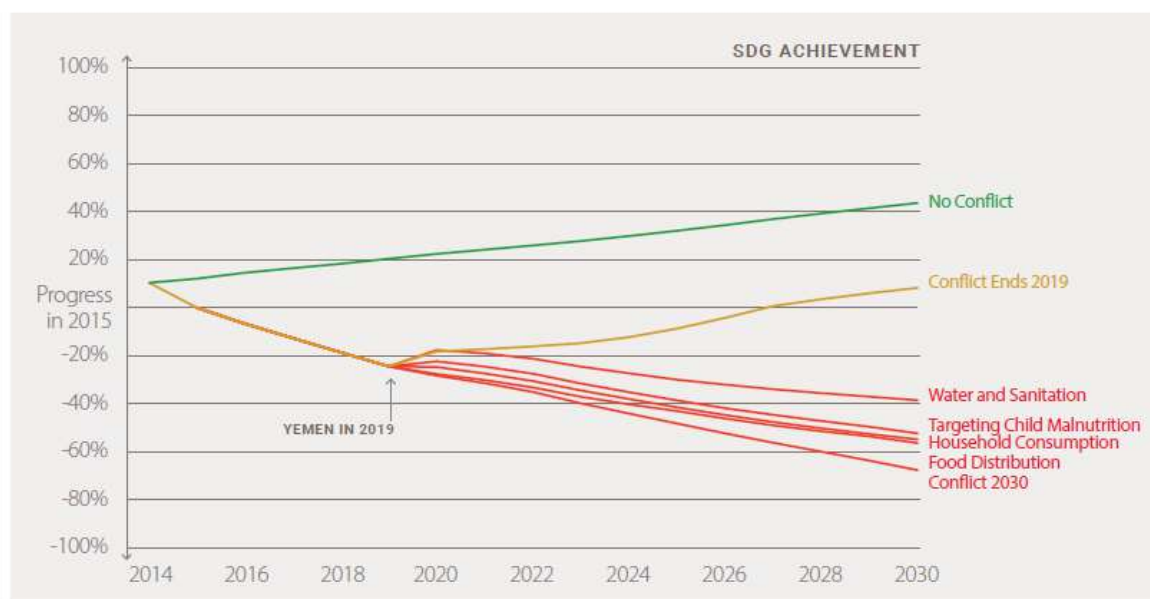
The war in Ukraine is causing immense suffering and loss of life, as well as destruction to property, while also giving rise to huge movements of people. Besides the large number of military casualties, as of Jan 2023, there have been tens of thousands of civilian casualties, 6,952 killed and 11,144 injured⁴⁰. There are more than 8.1 million refugees, most of them women and children, as well as 5.3 million internally displaced persons (IDPs) creating one of the largest refugee and internal displacement crises of modern times⁴¹. The Ukraine war is wreaking havoc on the global economy, leading to food and energy price hikes, and a potent cost of living crisis⁴².

Conflict and unrest have surged in many countries creating tangible barriers to SDG progress (Box 1-3). In Ethiopia, for example, in 2021, some 2.5 million people were displaced due to conflict. In Afghanistan, the number of displaced people increased for the 15th straight year. In Venezuela, the number of refugees is on the rise. A number of other countries saw increases of between 100,000 and 500,000 internally displaced people in 2021, including the Democratic Republic of the Congo, Nigeria, South Sudan, Sudan, the Syrian Arab Republic and Yemen.⁴³

Box 1-3: SDG attainment amidst conflict, the case of Yemen

In Yemen, since 2014 conflict has impacted food security, social and health services—reversing decades of development.⁴⁴ Projections of SDG attainment in Yemen have shown how conflict has impacted progress toward SDG 1: No Poverty; SDG2: Zero Hunger; SDG 6: Clean Water and Sanitation; SDG 8: Decent Work and Economic Growth; SDG 10: Reduced Inequalities. Scenarios indicate that if the conflict had ended in 2019, Yemen would have been eight percent closer to achieving some SDGs (compared to 2015) due to reduced poverty and malnutrition, along with greater economic growth; however, if conflict continues throughout 2030, Yemen will face generational impacts of poverty, malnourishment, and socio-economic setbacks.⁴⁵

SCENARIOS OF IMPACTS OF CONFLICT ON SDGS IN YEMEN



Layered on top of SDG challenges from conflict, Yemen faced further setbacks due to the COVID-19 pandemic. With a healthcare system weakened from conflict, Yemen had three doctors and seven beds per 10,000 people when the pandemic hit. Only half of those healthcare facilities were operational, two-thirds of Yemenis lacked access to healthcare, and drinking-water, sanitation and hygiene (WASH) were inadequate - all barriers for Yemenis to stay safe during the pandemic.⁴⁶

Afghanistan is facing severe food insecurity throughout the country and is home to millions of internally displaced Afghans and those seeking refuge⁴⁷. Beyond increased instability, gender equality in Afghanistan has also been jeopardized with women facing exclusion from public and political life, and restricted access to education, humanitarian assistance, employment, justice and health services.⁴⁸

In the Sahel region of Africa progress across the SDGs is being blocked by the proliferation of armed groups in the region and the collapse of the Libyan state.^{49 50} As of March 2023, some 3.1 million Sahelians were internally displaced by conflict.⁵¹ Similarly, between March and May 2022, approximately 26.5 million people in the Sahel were in crisis or worse with respect to food and nutrition.⁵²

Inflation and the cost-of-living

Around the globe, people face a severe cost-of-living crisis⁵³. The pandemic and subsequent recovery pushed up prices for food and energy, which rose further as a result of the war in

Ukraine. As the war broke out, food prices peaked in March 2022. Since then, they have fallen somewhat but remain at historic highs⁵⁴. Many countries are seeing domestic food inflation. Between June and September of 2022, around 89 per cent of Least Developed Countries (LDCs), 93 per cent of Landlocked Developing Countries (LLDCs) and 94 per cent of Small Island Development States (SIDS) had food inflation above 5 per cent, with many experiencing inflation in double digits.⁵⁵

Worst affected by inflation are the poor who spend a significant amount of their budget on food and fuel. Often, they respond by skipping meals or purchasing cheaper and less nutritious food – short-term solutions that can have long-term consequences for health and future prospects particularly of children.⁵⁶ The cost-of-living crisis is pushing an additional 78 million – 141 million into poverty⁵⁷. Women and the urban poor are at greatest risk of facing hunger and deprivation and need urgent support⁵⁸.

In response to high inflation, countries have put in place measures including fuel and energy subsidies (about a quarter of total measures), food and fertilizer subsidies, cash transfers, labour market programs and other measures, with the capacity of countries to implement such programmes varying significantly across the world⁵⁹. Increased spending on fuel subsidies can alleviate household expenditure challenges, but with implications for addressing the climate and biodiversity crises.

Central banks face the classic trade-off between controlling prices and supporting growth. A number of countries have responded to inflationary pressures by tightening monetary policy. The United States Federal Reserve has increased interest rates which drove up the exchange rate of the dollar with knock-on effects for other countries that have to pay in dollars for fuel and other commodities. Around the world other central banks are defending their currencies from the rising dollar by also increasing their own interest rates⁶⁰. All of which raises the spectre of an impending global economic slowdown, with ominous implications for the SDGs. Forecasts for global growth in 2023 have been lowered to 1.7 percent, the third weakest growth in nearly three decades⁶¹.

Policy makers keen to help the most vulnerable in their countries are faced with tough choices as they operate with limited fiscal space. The pandemic, and high inflation may have pushed debt in developing countries to an estimated 50-year high⁶²; and now the fiscal positions of many countries are being further weakened by rising interest rates and ballooning debt servicing costs. Almost half of the LDCs and more than one in every three SIDS and LLDCs are in debt distress or at high risk⁶³. Others lack the resources to expand social spending, such as through cash transfers, tax cuts or other relief, which could help offset the impacts of rising prices on businesses and households.

Insufficient progress on the SDGs

Slow progress towards the SDGs has made many countries far more vulnerable during the recent spate of crises. For example, high inequality, lack of universal healthcare and inadequate social safety nets left vulnerable groups even more exposed to the myriad health, social and economic impacts of COVID-19, while unequal gender roles placed an enormous burden on women. Similarly, many countries that had made insufficient investments in agriculture, or efforts to diversify their sources of energy, were highly dependent on food and fuel imports from a handful of countries, including Russia and

922 Ukraine. Inadequate protection of forests and trafficking of wildlife also increased the risk of
923 zoonotic diseases.

924 Some of the shocks are temporary. For example, economic growth bounced back in 2021
925 and extreme poverty is now falling again. However, even temporary reversals at the
926 national level can have lifelong impacts on individual families, and particularly on children
927 who have lost a breadwinner, or a family member, or who never return to school⁶⁴. Years of
928 malnutrition or lost education create setbacks that can last a lifetime.

929 The Secretary-General's Annual SDG Progress Report analyses the most recent data⁶⁵. The
930 following sections complement this assessment by considering the impacts of crises on the
931 SDGs and set the stage for subsequent chapters, which consider how the SDGs can and must
932 be achieved. In the current context of multiple and overlapping crises, scaling up and
933 accelerating the necessary actions has never been more urgent.

934 *SDG 1 – No poverty*

935 Any predictions that SDG 1 would be achieved by 2030 have been upended. When the
936 pandemic struck, there had been steady progress on reducing global poverty even though
937 the no poverty target was not on track to be achieved⁶⁶. The combined crises have pushed
938 an additional 75 million to 95 million into extreme poverty⁶⁷. Roughly 575 million people will
939 still be in extreme poverty in 2030⁶⁸ with poverty particularly entrenched in sub-Saharan
940 Africa (Box 1-4).

Box 1-4: Poverty remains prevalent in Africa despite the forecast decline

942 The COVID-19 pandemic marks a turning point in the trajectory of global poverty reduction, halting three
943 decades of successful reduction of global poverty and inequality. The war in Ukraine, multiple regional conflicts,
944 and climate shocks are compounding the situation⁶⁹.

945 In this context, Africa is strongly affected. In 2022, around 460 million people on the continent were living below
946 the extreme poverty line of 1.90 U.S. dollars a day. Nigeria and the Democratic Republic of the Congo accounted
947 respectively for around 12 and 11 per cent of the global population in extreme poverty. Other African countries
948 with a large poor population included Tanzania (4.3 per cent), Mozambique (3.5 per cent) and Madagascar (2.8
949 per cent). Throughout Africa, rural households face higher poverty levels. In 2022, for instance, the extreme
950 poverty rate reached about 50 per cent among the African rural population, compared to 10 percent in urban
951 areas. The current levels of poverty on the continent are forecast to decrease in the coming years, with the
952 number of inhabitants living below the extreme poverty line falling to 411 million by 2027. However, Africa
953 would remain the poorest region compared to the rest of the world⁷⁰.

954 Informal economies, weak social protection systems and less developed financial systems are aggravating
955 attributes in dealing with poverty and inequality. Africa's natural and human endowments present opportunities
956 to address the challenges it is facing. Addressing underlying structural barriers to reducing poverty, including
957 unequal international financial structures, in the coming years is vital.

958
959 People suffer from poverty not just in terms of low income but in many other aspects of
960 daily life. The multidimensional poverty index (MPI) accounts for deprivations faced by
961 households in health, education and standard of living. Under these three broad
962 dimensions, MPI tracks deprivations in ten indicators of human well-being. In 2022, 1.2
963 billion people live in multidimensional poverty. The health dimension accounts for 24.9 per
964 cent of the deprivations, the education dimension for 31.3 percent and the standard of
965 living dimension for 43.8 per cent. Most poor households are deprived in access to modern

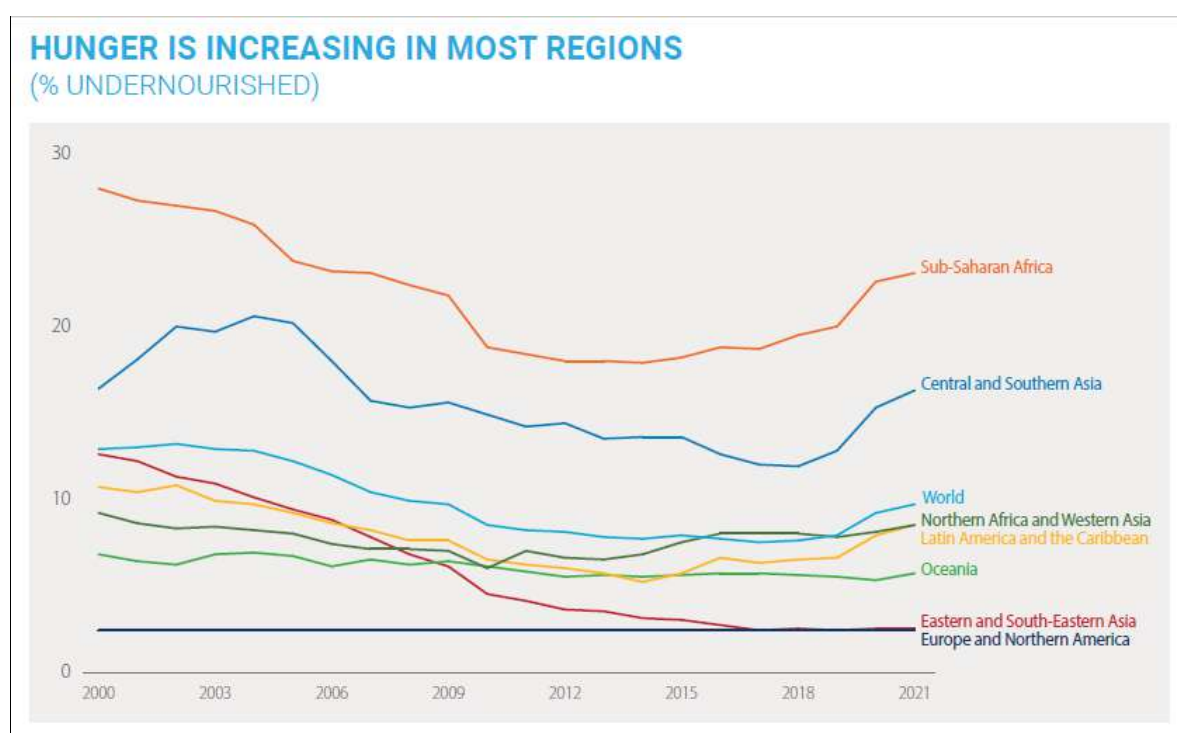
fuels, while many deprivations link to housing, sanitation, drinking water, school attendance and child mortality. Early indications on the impacts of the pandemic globally are striking, showing a significant worsening in all 10 MPI deprivations among the poor⁷¹.

In response to COVID-19 and its impacts on poverty, governments across the world quickly ramped up social protection, often through digital means. For example, in Togo, the Government made quick and efficient digital payments to 600,000 urban residents.⁷² However the pandemic also exposed vast shortfalls in digital and non-digital coverage with particular difficulties in reaching informal workers, women and youth. In response to the pandemic, around the world, cash transfers covered on average just 46 per cent of recipients' pre-pandemic incomes.⁷³

SDG 2 – Zero hunger

Between 2019 and 2020, globally, the proportion of people living with hunger increased from 8.0 to 9.3 per cent, and in 2021 to 9.8 per cent (figure 1-4).⁷⁴ Hopes that food security would quickly recover from the pandemic were dashed. The hardest hit region was Africa, with hunger at around 20 per cent in 2021. Since 2015, the prevalence of hunger in Africa has increased by 4.4 percentage points.⁷⁵

Figure 1-4: Prevalence of undernourishment



Source: UN 2023

COVID-19 and the measures to contain it had a disproportionate impact on women, especially rural women, through reduced food production and distribution capacities, decreased purchasing power and reduced access to nutritious food⁷⁶. Women already face greater constraints in accessing productive resources, technologies, markets, and social protection. The pandemic also increased their workload and levels of gender-based violence⁷⁷.

991 Food supplies have been cut by the war in Ukraine. Russia and Ukraine supply 12 per cent of
992 the world's traded calories and are among the top five global exporters for cereals and
993 oilseeds, including wheat, barley, sunflowers, and maize⁷⁸. These two countries produce 73
994 per cent of the world's sunflower oil and 30 per cent of its wheat⁷⁹. In 2022, the Global
995 Report on Food Crises found that 53 countries were dependent on imports, and 36
996 depended on imports from Ukraine or Russian exports for more than 10 per cent of their
997 total wheat imports. For Somalia, the proportion was over 90 per cent, for the Democratic
998 Republic of the Congo 60 per cent, and from Madagascar over 70 per cent.⁸⁰ Food supplies
999 have been further affected by climate change through droughts and low rainfall and by
1000 conflict.

1001 Up to 205 million people were expected to face acute food insecurity and be in need of
1002 urgent assistance, over the period October 2022 to January 2023, including in Afghanistan,
1003 Ethiopia, Nigeria, South Sudan, Somalia and Yemen⁸¹. Rising prices and difficult access to
1004 grains have severely affected humanitarian aid to support refugees and countries in conflict.
1005 The World Food Program used to buy 50 per cent of its wheat in Ukraine.

1006 Globally, between 2000 and 2022 the prevalence of stunting among children under five
1007 declined steadily from 33 to 22 per cent, though this could have slowed down because of
1008 the pandemic⁸². In 2022, 45 million children (6.8 per cent) suffered from wasting. The
1009 prevalence of anaemia in women of reproductive age continues to be alarming, stagnant at
1010 around 30 per cent since 2000 and low and lower-middle income economies bear the
1011 greatest burden of stunting, wasting, low birth weight and anaemia.⁸³

1012 *SDG 3 – Good health and wellbeing*

1013 The number of excess deaths attributable to the pandemic, directly or indirectly, is around
1014 15 million.⁸⁴ Between, 2019 and 2021, global life expectancy, which had been increasing, fell
1015 from 72.8 to 71.0 years.⁸⁵ The pandemic put health services under severe financial and
1016 organizational strain and diverted resources from other medical needs. In addition, during
1017 lockdowns patients lost access to medical facilities, delaying treatment for chronic
1018 conditions including HIV, non-communicable diseases (NCDs), and cancers.^{86, 87, 88 89} Deaths
1019 from tuberculosis (TB) and malaria increased⁹⁰. Ongoing suffering has also heavily impacted
1020 mental health in multiple ways⁹¹.

1021 Prior to the COVID-19 pandemic, global health trends were encouraging – with progress on
1022 reproductive, maternal and child health, immunization coverage, and treatment of
1023 communicable diseases. But subsequently at least 50 per cent of countries reported
1024 disruption to services for NCDs and over one-third reported disruptions across mental,
1025 neurological, and substance-use services⁹². At the current pace, many indicators, including
1026 premature mortality due to NCDs, the incidence of TB, malaria, and new HIV infections, will
1027 not meet their SDG targets by 2030.⁹³

1028 The pandemic has also disrupted regular vaccination schedules. Between 2019 and 2021,
1029 global infant vaccine coverage for diphtheria-tetanus-pertussis (DPT3) dropped from 86 to
1030 81 per cent, with 25 million children under one year old not receiving basic vaccines – the
1031 highest number since 2009.⁹⁴ As of 2022, 68 million children are known to be un- or under-
1032 vaccinated⁹⁵.

1033 There are also significant health hazards from environmental factors including pollution.
1034 Globally, there are 6.7 million deaths each year from exposure to ambient and household air
1035 pollution and 99 percent of the world's population lives in places where air pollution
1036 exceeds WHO guideline limits⁹⁶. Global public health continues to be threatened by these
1037 health hazards.

1038 *SDG 4 – Quality education*

1039 The pandemic has been the largest disruptor of education systems in history. Globally, at
1040 the peak of the crisis, school closures affected over 90 per cent of students⁹⁷. By October
1041 2021, schools had been at least partially closed for 55 per cent of total days⁹⁸. As a result,
1042 more than one billion children are at risk of falling behind in their studies, while over 100
1043 million additional children will fall below the minimum proficiency level for reading.⁹⁹

1044 The longer children are out of school, the less likely they are to return; the same risk applies
1045 to students who had no access to remote learning during lockdowns. UNESCO estimates
1046 that half of all global learners do not have a household computer and 43 per cent have no
1047 household internet access – with the widest gaps in low-income countries.¹⁰⁰ Lost learning
1048 due to COVID-19 may affect a generation of students: the World Bank estimates that, over
1049 their working life, students currently in school stand to lose a cumulative \$17 trillion.¹⁰¹

1050 The impacts have been greatest in low-income countries, and for low-income households, as
1051 well as for women and girls, persons with disabilities, migrants, and refugees. Even before the
1052 COVID-19 pandemic, the world was off-track for achieving quality education at all levels by
1053 2030. Some 64 million children of primary school age were out of school, as were 63 million
1054 adolescents of lower-secondary age, and 132 million youth of upper-secondary age¹⁰².

1055 One success for girls' education is that the world is closer to gender parity. At all three levels
1056 of education the gender gap is less than one percentage point. The region furthest from
1057 parity is Sub-Saharan Africa. Overall, however the largest gaps in access to education are not
1058 by sex but by income and location¹⁰³.

1059 *SDG 5 – Gender equality*

1060 COVID-19 generated new pressures on women and girls. In 2020, women with children at
1061 home on average spent 31 hours per week on childcare – five hours more than before the
1062 pandemic.¹⁰⁴ When schools and preschools closed during COVID-19, women shouldered
1063 most of the childcare – and nearly 60 per cent of countries took no steps to offset this
1064 increase in unpaid work¹⁰⁵. Due to the increasing pressures of unpaid care, more than two
1065 million women left the workforce.¹⁰⁶ Globally, employment for women fell by 4.2 per cent
1066 compared with 3 per cent for men.¹⁰⁷ Approximately 12 million women experienced
1067 disruptions in birth control, resulting in 1.4 million unwanted pregnancies.¹⁰⁸

1068 In 2020, in many countries there were much higher call volumes on emergency hotlines for
1069 violence against women.¹⁰⁹ One in four women reported increased household conflict and
1070 intimate partner violence¹¹⁰. UNICEF estimates that by 2030 due to COVID-19 around 10
1071 million more girls will be at risk of child marriage.¹¹¹ Similarly, other harmful practices such
1072 as female genital mutilation (FGM) increased during the pandemic as girls were kept home,

1073 away from the protective environment of schools¹¹². Disruption to services may lead to 2
1074 million more FGM cases over the next decade¹¹³.

1075 Globally, most frontline workers are women, who make up about 70 per cent of health
1076 workers and first responders, which puts them at continuous high risk of infection. But they
1077 are less likely to be in charge: notably, in 2020 women held only 24 per cent of seats on
1078 COVID-19 taskforces.¹¹⁴ And while the proportion of seats held by women in national
1079 parliaments and local governments has steadily increased in recent years, in 2023, women
1080 held only 26.5 per cent of seats in lower and single chambers of parliaments and 35.4 per
1081 cent in local government.¹¹⁵

1082 In addition to impacts from the pandemic, women's sexual and reproductive health have
1083 been affected by in legal restrictions, recent social backlashes, and vulnerabilities
1084 experienced through violent conflict and climate change.¹¹⁶ Progress on the 2030 Agenda
1085 cannot be achieved if half the human race is left behind. Advancing on SDG 5 can untap
1086 huge potential and have multiplier effects across the SDGs.

1087 *SDG 6 – Clean water and sanitation*

1088 Between 2000 and 2020, the proportion of the world's population that used safely managed
1089 drinking water increased from 62 to 74 per cent – representing safer water for two billion
1090 more people. Nevertheless, there are vast inequalities between and within countries, and
1091 2.2 billion people still do not use safely managed drinking water¹¹⁷. Progress is also
1092 threatened by climate change, and by competing agricultural, ecological and financial
1093 priorities, along with multiple threats to water quality.¹¹⁸

1094 More people also have access to adequate and equitable sanitation and hygiene, with a
1095 reduction in open defecation yet 3.4 billion people still lack safely managed sanitation
1096 services and 1.9 billion lack basic hygiene services¹¹⁹. It is currently estimated that 2.3 billion
1097 people live in water stressed countries, of which 733 million live in high and critically high
1098 water stressed countries¹²⁰. Those most at risk are those living in fragile contexts who are
1099 less likely than other people to have safely managed drinking water or sanitation services¹²¹.
1100 Especially vulnerable are people living in refugee camps: in many countries, camps are
1101 unable to meet the target of 85 per cent of households having a toilet and 95 per cent
1102 having access to soap.¹²²

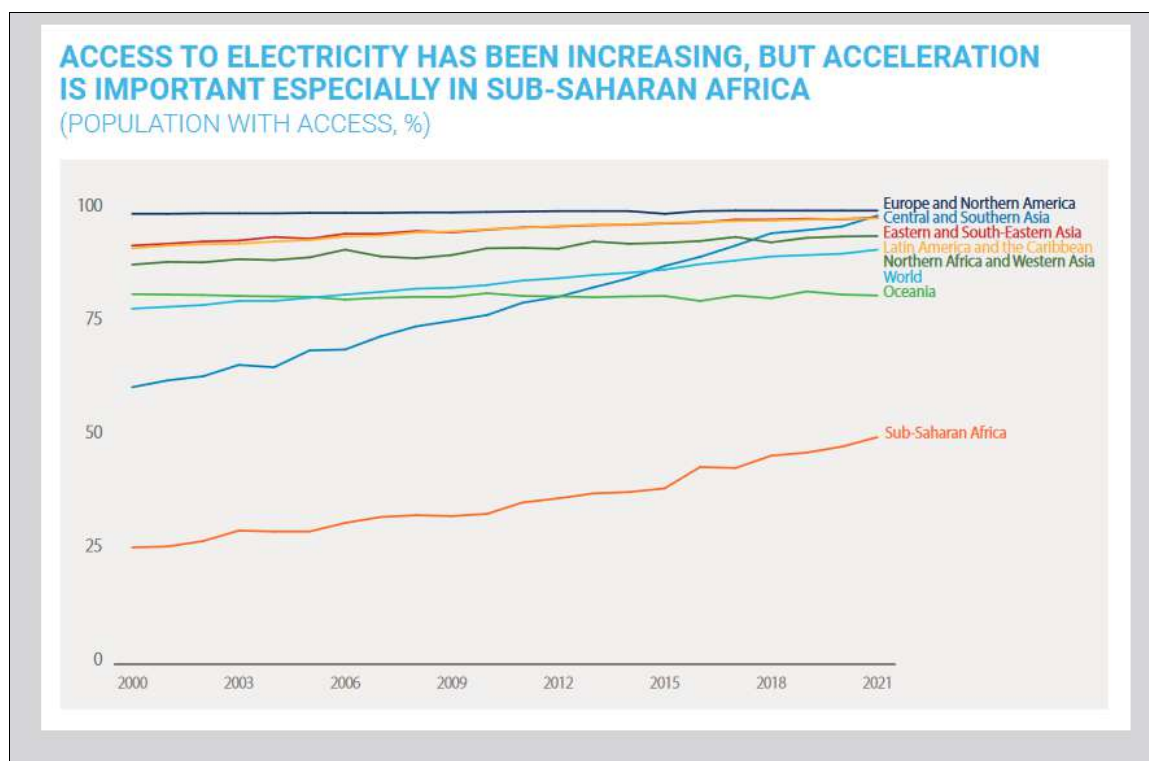
1103 Over half (107) countries are not on-track to have sustainably managed water resources by
1104 2030 which is vital for balancing competing water demands from across society and the
1105 economy. Out of 153 countries that share transboundary waters, only 24 countries
1106 reported that all the rivers, lakes and aquifers that they share with their neighbors are
1107 covered by operational arrangements for cooperation, which are important instruments to
1108 prevent or manage conflicts and promote regional sustainable development¹²³.

1109 *SDG 7 – Affordable and clean energy*

1110 The war in Ukraine prompted a global energy crisis. Some 75 million people have lost the
1111 ability to afford extended electricity services, and 100 million people, faced with surging
1112 prices for liquified petroleum gas may revert to traditional fuels like coal and solid cooking
1113 fuels.¹²⁴ The global population with access to electricity has increased to 91 per cent in 2021

but the pace of growth has slowed in recent years and some 675 million people, mainly located in LDCs and sub-Saharan Africa, still lack access (figure 1-5).

Figure 1-5: Proportion of population with access to electricity



Source: UN 2023

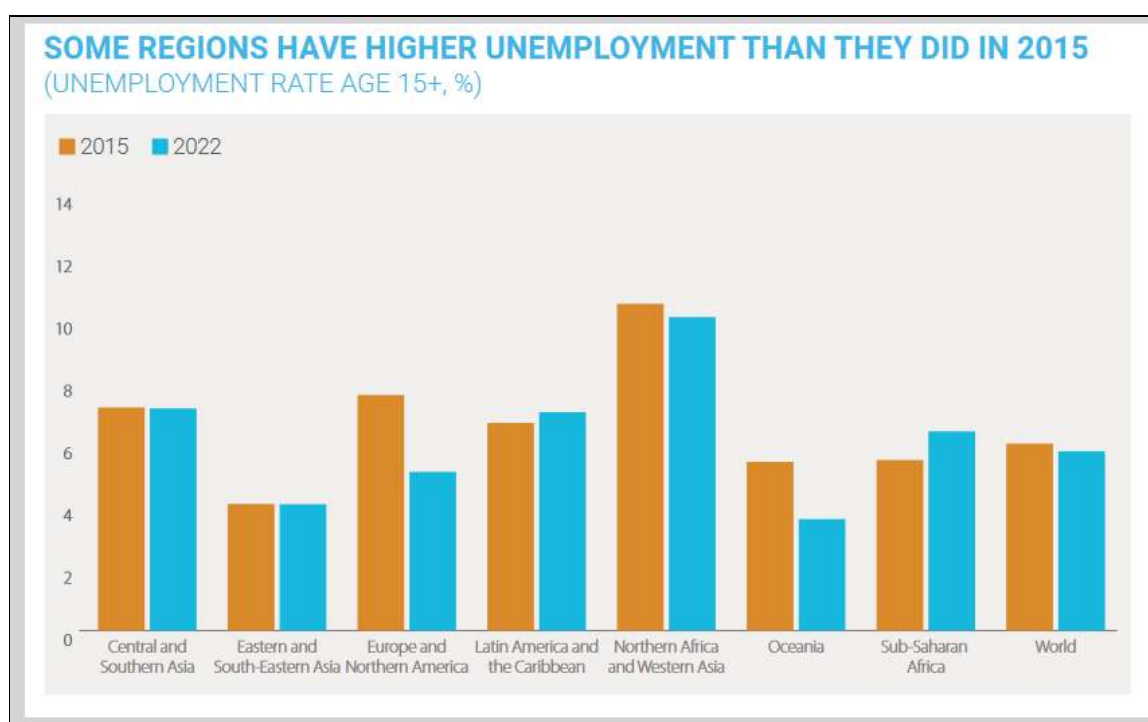
On a more optimistic note, the world could be transitioning faster towards green energy. Since 2010, the cost of solar power and lithium-battery technology has fallen by more than 85 per cent, and the cost of wind power by about 50 per cent¹²⁵. Green energy is now seen as a growth sector that can create jobs and boost economic growth, while also bringing resilience and long-term benefits.¹²⁶ In 2022, for the first time, investment in green energy exceeded that in fossil fuels and in the next few years global coal use is expected to start declining. The war in Ukraine led to a spike in the use of fossil fuels, including coal, but this is expected to be short-lived, with the demand for fossil fuels expected to peak in the near future.¹²⁷

SDG 8 – Decent work and economic growth

Economic activity and international trade were severely disrupted by the war in Ukraine so that global growth is expected to slow from 5 per cent in 2021 to 1 per cent in 2023¹²⁸. With shrinking fiscal space and the need to curb inflation, governments cannot sustain the types of monetary support, including low interest rates, offered during the pandemic.¹²⁹

In the past, economic growth has typically been accompanied by increases in greenhouse gas emissions – with corresponding increases in global heating, and damage to biodiversity. In 2020 COVID-19 lockdowns and disruptions in supply chains resulted in a six per cent decline in global emissions¹³⁰. In 2021, however, as economic activity revived, the drop in emissions was reversed and emissions continued to grow in 2022¹³¹.

Figure 1-6: Unemployment rate (%), for persons 15 years and older



Source: UN 2023

Global unemployment peaked in 2020 at 6.9 per cent but is lower at 5.8 per cent in 2022. However, some regions have higher unemployment than they did in 2015 (figure 1-6). In 2022, informal wage employment still trailed its pre-crisis level by 8 per cent, leaving many families in a precarious position, with rising poverty and inequality¹³². Most countries have not yet returned to the levels of employment and hours worked seen before the outbreak of the pandemic. Global employment is projected to increase by 1 per cent in 2023, a significant deceleration from the 2.3 per cent growth in 2022¹³³.

In the years ahead, achieving the 2030 agenda will mean decoupling economic growth from environmental damage and ensuring that growth is also more inclusive. A green transition can also be an opportunity for employment and job creation in green sectors. Such a transition could create a net 18 million jobs worldwide¹³⁴.

SDG 9 – Industry, innovation and infrastructure

The pandemic affected almost one-in-three jobs in the manufacturing industry. But impacts varied between enterprise and industries. Production of essential goods including food, chemicals and paper remained robust and there was higher demand for producers of pharmaceuticals, medical equipment and computers. Also, high-tech industries, including machinery and electrical equipment bounced back rapidly after lockdown restrictions were eased. On the other hand, manufacturing small and medium enterprises (SMEs) did not fare so well, with labour-intensive industries such as apparel, furniture, leather and others, reporting drops in sales.¹³⁵ Generally, countries with larger and stronger manufacturing systems weathered the crises better.¹³⁶

1165 Innovation investments were resilient in the face of the pandemic. Investment in global
1166 research and development (R&D) grew at 3.3. percent, not falling, but slowing from the
1167 2019 record high rate of 6.1 percent. Government R&D budgets grew. Corporate R&D
1168 spending also grew substantially, driven by ICT sectors and also biotechnologies,
1169 nanotechnology, new materials and other areas that are transforming health, food,
1170 environment and mobility. The biggest boom was in venture capital which has also been
1171 very active in Latin America and the Caribbean and in Africa¹³⁷.

1172 The pandemic moved many activities of daily life including work, school, retail, banking, and
1173 health, online and caused an unprecedented acceleration in digitalization of services. Sixty-
1174 six per cent of the global population or 5.3 billion people used the internet in 2022, up from
1175 54 percent in 2019. However, 2.7 billion people globally have yet to access the internet.
1176 They are missing out on vital services provided digitally. Some groups, such as older persons
1177 and persons with disabilities, are being left behind¹³⁸.

1178 Adequate and resilient infrastructure is a prerequisite for all the SDGs and even before the
1179 pandemic, infrastructure was far from adequate. Some one billion people live more than a
1180 mile from a road and 450 million live beyond range of a broadband signal. With fiscal
1181 tightening and the end of low borrowing costs, infrastructure updates and investments are
1182 likely to be below what is needed¹³⁹. The war in Ukraine is expected to continue to dampen
1183 the slow investment recovery following the pandemic¹⁴⁰.

1184 *SDG 10 – Reduced inequalities*

1185 COVID-19 magnified pre-existing inequalities including health inequalities and inequalities in
1186 the capacity to cope. In terms of income inequality, the global Gini coefficient increased by
1187 about 0.5 points, from 62 points in 2019 to about 62.6 points in 2020¹⁴¹.

1188 COVID-19 widened the gaps between low- and high-paid workers. Lower-paid workers are
1189 less likely to have jobs that can be done from home, and they and essential workers tend to
1190 interact more with people – exposing them to infection. Many service industries such as
1191 tourism and restaurants which have a high proportion of low-paid workers, had to be
1192 suspended. These workers and many others in the informal sector have little cover from
1193 social protection.¹⁴²

1194 During the pandemic, wealthy individuals increased their assets while the poor became
1195 poorer.¹⁴³ The world's 10 richest people doubled their incomes, while 99 per cent of
1196 humanity became worse off.¹⁴⁴ Between 2020 and 2021, the productivity gap between
1197 advanced and developing countries widened further in real terms, from 17.5:1 to 18:1, the
1198 highest gap since 2005. ¹⁴⁵Inequality between countries is expected to rise as a result of
1199 weak recoveries in emerging markets and developing economies, further exacerbated by
1200 inflation.

1201 *SDG 11 – Sustainable cities and communities*

1202 More than half of the world's population lives in cities and by 2050 that proportion is
1203 expected to rise to two-thirds. ¹⁴⁶ Between 2020 and 2021, 2.9 million people in slums and
1204 informal settlements gained access to basic services. However, many challenges remain for

1205 urban areas¹⁴⁷. Poverty rates are falling slower than in rural areas.¹⁴⁸ Cities account over 80
1206 per cent of global GDP, and more than 70 per cent of global greenhouse gas emissions¹⁴⁹.

1207 During the COVID-19 pandemic, cities bore the brunt of the impact, with economic
1208 downturns due to lockdowns, while many people lacked safe water and sanitation or green
1209 public spaces for exercising in – particularly those in informal settlements and urban slums
1210 which faced overcrowding and had limited socio-economic support.¹⁵⁰

1211 Well planned, compact cities can improve the environment and people’s health and well-
1212 being. But rapid and poorly planned urbanization can lead to deep inequalities, in housing,
1213 public transportation, and access to basic services. “Leaving no one behind” will require an
1214 intensified focus on 1 billion slum dwellers¹⁵¹.

1215 *SDG 12 – Responsible consumption and production*

1216 Overconsumption—using too many natural resources too quickly and inefficiently—has
1217 created a triple planetary crisis – of climate change, biodiversity loss, and pollution.
1218 Between 2000 and 2019, material footprint consumption per capita rose steadily and
1219 reached 95.1 billion metric tons¹⁵² While at the global level, production and consumption
1220 will necessarily match, the data diverge at the regional and national levels, with larger
1221 consumption footprints in the Global North.

1222 At the same time the world generates very high levels of waste. Globally, around 14 per
1223 cent of food is lost in production processes and 17 per cent is lost in retail and
1224 households.¹⁵³ Other forms include improperly managed electronic and chemical waste. On
1225 current trends, the world will generate 3.40 billion tonnes of solid waste annually by
1226 2050.¹⁵⁴ Unsustainable resource use has also been bolstered by continuing fossil fuel
1227 subsidies.

1228 Plastic pollution has risen exponentially in the last few decades, to some 400 million tons
1229 per year, and is set to double by 2040¹⁵⁵. The COVID-19 pandemic resulted in a documented
1230 increase in demand for single-use plastics, worsening the severe impacts on natural
1231 ecosystems and human health¹⁵⁶. The 5th United Nations Environment Assembly Session
1232 (UNEA-5.2) adopted a historical resolution to end plastic pollution and forge an
1233 international legally binding agreement by 2024¹⁵⁷.

1234 Learning to live in balance with planet earth is at the core of the 2030 Agenda. Without
1235 sustainable use of resources, it will not be possible to limit damage to the climate, and land
1236 and sea ecosystems. Research shows that up to 2015, countries tended to transgress
1237 biophysical boundaries at a faster rate than social thresholds were achieved, suggesting a
1238 recurring pattern of environmentally unsustainable social development gains¹⁵⁸.

1239 *SDG 13 – Climate action*

1240 The world is already 1.1°C hotter than in preindustrial times¹⁵⁹. The latest data from the
1241 IPCC shows that global average temperatures are estimated to breach 1.5°C by the early
1242 2030s¹⁶⁰. Given current pledges in Nationally Determined Contributions (NDCs), warming is
1243 likely to be between two and three degrees over preindustrial times by the end of the
1244 century.¹⁶¹

1245 Failure to achieve SDG 13 and ensure deep, rapid and sustained reductions in GHG
1246 emissions leads to dangerous climate change, for humans and all living beings. The world is
1247 already seeing unprecedented sequences of hurricanes, wildfires, floods, and heat stress
1248 damaging agricultural production, fisheries, forests and ecosystems that people the world
1249 over rely on. Global warming beyond the 1.5 degrees target risks triggering multiple tipping
1250 points in the climate system and causing planetary instability¹⁶². Climate change could force
1251 as many as 216 million people to move within their countries by 2050.¹⁶³ The IPCC projects a
1252 200 per cent increase in human displacement across Africa for 1.6°C of global warming and
1253 an increase of 600 per cent for 2.6°C of global warming.¹⁶⁴

1254 In many countries, the COVID-19 economic stimulus packages created opportunities to
1255 invest in more sustainable and climate-resilient systems. Some countries did apply part of
1256 their stimulus funds this way, but overall, the results were more grey than green.¹⁶⁵ Based
1257 on OECD data, government support that could damage the environment amounts to more
1258 than \$680 billion annually around the world, including subsidies for fossil fuel production
1259 and for consumption, and environmentally harmful agricultural support. After only two
1260 years, these subsidies have already cancelled out the \$1,090 billion of green spending to be
1261 spent over multiple years.¹⁶⁶

1262 Combined with innovations in clean energy, sufficient funding for scale up, and other efforts
1263 to decarbonize the world's economies, natural climate solutions offer some of the best
1264 options in the response to climate change¹⁶⁷. Nature based solutions often rely on the
1265 participation and inclusion of local communities and indigenous people and can enhance
1266 their agency. Examples include investing in green areas to reduce temperatures, improving
1267 water quality, and improving agricultural practices to ensure food security¹⁶⁸.

1268 At the COP 27 climate talks in Egypt, the commitment to the Paris goals was reaffirmed and
1269 it was recognized that limiting global warming to 1.5 degrees Celsius requires rapid, deep
1270 and sustained reductions in global greenhouse gas emissions of 43 per cent by 2030 relative
1271 to 2019 levels. COP 27 resulted in the establishment of a Loss and Damage Fund to be
1272 financed by wealthy nations to help vulnerable countries cope with climate change-induced
1273 disasters.

1274 Without achieving SDG 13, it will be close to impossible to achieve Agenda 2030. Limiting
1275 the human suffering from a warming planet will require transformational change in energy
1276 and economies.

1277 *SDG 14 – Life below water*

1278 Climate change, pollution, habitat destruction, public sector subsidies for harmful ocean
1279 economic activity¹⁶⁹ and overfishing still pose a threat to the ocean and are increasingly
1280 degrading the ocean's ability to regulate the climate and sustain livelihoods. Since 1970,
1281 there has been a global-scale decline in 14 out of 18 categories that measure the capacity of
1282 nature to "sustain contributions to good quality of life"¹⁷⁰. In 1974, 10 percent of stocks
1283 were fished at "biologically unsustainable" levels; in 2019, that proportion had increased to
1284 35.4 percent¹⁷¹. Notably, that rate of degradation has slowed over the last decade due to
1285 diverse efforts. The majority of landings (82.5%) come from biologically sustainable assessed
1286 stocks¹⁷². Global catches were reconstructed to include estimates of illegal, unreported and

1287 unregulated (IUU) catches from 1950-2010. Over that time period, the reconstructed
1288 estimates were 53 per cent higher than recorded catches but importantly the proportion of
1289 IUU catches peaked in the 1990's and have fallen¹⁷³. Discards have also declined from the
1290 1990s are currently estimated at 10-12 per cent of unreported¹⁷⁴.

1291 Despite improvements, there are still tremendous challenges. Nations with low levels of
1292 wealth and nutritional status that also depend on fisheries are affected more by climate-
1293 change impacts on fished species than by their own fishing practices, even as they
1294 contribute least to climate change. Those nations are in areas where there is a higher
1295 proportion of fished species at risk to climate change.¹⁷⁵ Several areas are also hotspots for
1296 marine heatwaves¹⁷⁶ which may further imperil their long-term food security. Small island
1297 developing states are highly vulnerable and would benefit greatly from a blue economy.

1298 Funding allocations to SDG 14 globally remains lower than for any other SDG.¹⁷⁷ Indeed, four
1299 targets of SDG 14, related to marine protection and management, expired in 2020; the
1300 corresponding indicators show that most nations have made very little progress, which can
1301 be related to a lack of capacity, funding, and commitment¹⁷⁸. Recently, written
1302 commitments to ocean sustainability provide a reason for hope, including a recent WTO
1303 agreement to reduce harmful fisheries subsidies, the new Global Biodiversity Framework
1304 (GBF), the 30x30 pledge by member nations to protect 30% of land and sea by 2030, and
1305 finally the UN High seas treaty to extend the 30X30 pledge to the High Seas, which are areas
1306 beyond national jurisdiction. These global level commitments to SDG aligned goals require
1307 the corresponding capacity and funding for full monitoring and implementation.¹⁷⁹.

1308 *SDG 15 – Life on land*

1309 Species are becoming extinct at unprecedented rates. Overharvesting of species,
1310 agricultural activities, logging and deforestation for agriculture are causing irreversible
1311 damage to the world's biodiversity. On current trends, between 1990 and 2030 the Red List
1312 Index of species survival will drop from 0.82 to 0.70 or lower. Only 32 per cent of countries
1313 are on track to achieve their national biodiversity targets.¹⁸⁰

1314 The poorest and the most vulnerable have traditionally relied on forests and small-scale
1315 fishing to supplement other lines of income, especially when facing loss of jobs and income
1316 related to the pandemic. Also land use change and degradation and resource-intensive
1317 consumption and production open up new pathways for infectious diseases. The pandemic
1318 recovery period and the COVID-19 recovery plans and stimulus packages offered an
1319 opportunity to change direction, but this has largely been missed. Five SDG 15 targets were
1320 to be met by 2020 but have come and gone with insufficient progress.

1321 In a promising development though, the recent Convention on Biodiversity Conference of
1322 Parties (COP) 15 resulted in a landmark Biodiversity agreement that aims to avert planetary
1323 disaster. The Kunming-Montreal Global Biodiversity Framework includes 23 targets aimed at
1324 reversing biodiversity loss by 2030, including a target to protect 30 per cent of land and
1325 oceans by 2030 (30X30). Other targets include cutting global food waste by half and
1326 progressive phasing out or reforming by 2030 subsidies that harm biodiversity by at least
1327 \$500 billion per year, while scaling up positive incentives for biodiversity conservation and
1328 sustainable use¹⁸¹. The Accelerator Partnership was also launched at COP 15 to help

1329 countries fast track and upscale the implementation of their National Biodiversity Strategies
1330 and Action Plans¹⁸².

1331 The Convention on International Trade in Endangered Species of Wild Fauna and Flora COP
1332 19 brought a record number of species to be regulated by it, to ensure that international
1333 trade in wildlife is sustainable, legal and traceable and does not aggravate biodiversity
1334 loss¹⁸³.

1335 *SDG 16 – Peace, justice and strong institutions*

1336 Progress on SDG 16 is threatened by rising levels of conflict, war and instability. Progress
1337 across the SDGs relies on peaceful and inclusive societies with access to justice for all and
1338 effective, accountable and inclusive institutions. These are especially important during times
1339 of uncertainty and crisis. Instead, when under strain they often deteriorate: the COVID-19
1340 pandemic, for example, exacerbated existing socio-economic insecurity and inequalities that
1341 worsened violence and illicit activities – weakening rights and protection systems with
1342 severe repercussions for marginalized people. The recovery from COVID-19 has also been
1343 undermined in some cases by corruption in the allocation of resources for emergency
1344 equipment and health services.

1345 During lockdowns there is less chance of detecting violence and abuse including against
1346 youth, older persons, women and the poor or of delivering assistance. Increases in
1347 unemployment rates also increased trafficking in persons, half of whom were trafficked for
1348 sexual exploitation or forced labour.

1349 SDG 16 should be seen as an enabler for other SDGs – it is an important condition for
1350 successful pathways to sustainability.¹⁸⁴ On the other hand the absence of institutional
1351 capacity and continuing violent conflicts in many parts of the world severely constrain the
1352 achievement of the SDGs.¹⁸⁵

1353 *SDG 17 – Partnerships for the Goals*

1354 SDG 17 is about strengthening the means of implementation to achieve all of the Goals and
1355 Targets including with sufficient access to science and technology, financial resources, fair
1356 and equitable trade and capacity for bringing about change. In the context of multiple
1357 crises, partnerships are strained as resources are redirected to crisis management and
1358 recovery efforts and protectionist policies may be appealing at home. For example, since the
1359 pandemic, much foreign aid has been directed towards immediate public health concerns.
1360 Total official development assistance (ODA) as a percentage of GNI reached 0.36 per cent in
1361 2022 compared to 0.31 percent in 2021, reflecting aid for Ukraine and increased spending
1362 on refugees. But it still fell far short of the 0.7 per cent target needed to support
1363 investments in longer-term sustainable development.¹⁸⁶

1364 Foreign direct investment (FDI) dropped to a point lower than during the 2008 financial
1365 crisis in 2020 during the pandemic, but has since recovered to pre-pandemic levels with a
1366 large part of the recovery growth in renewable energy and energy efficiency investments.¹⁸⁷
1367 Remittance flows registered a smaller decline due to COVID-19 than expected and
1368 recovered by 2021.¹⁸⁸ Despite these increases though, the scale of challenges to be
1369 addressed are leaving many lower-income countries fiscally strained.

1370 Equally as important to financial resources are partnerships to build capacity and enable
1371 access to science and technology innovations that can be applied to accelerate SDG
1372 progress. The importance of knowledge and science partnerships was on full display during
1373 the pandemic with open sharing of genome sequencing data, open-source designs for
1374 personal protective equipment (PPE), preprint publishing of research articles and data
1375 sharing platforms. Knowledge sharing enabled the development of COVID-19 vaccines in
1376 record time. But then mechanisms for sharing broke-down - as of April 2023, 3 out of 4
1377 people in high-income countries had received at least one dose of a COVID-19 vaccine while
1378 only 1 in 3 people in low-income countries had received at least one shot.¹⁸⁹

1379 SDG 17 calls for cooperation on and access to science, technology and innovation including
1380 through a global technology facilitation mechanism. In the context of multiple crises with
1381 impacts felt across the globe, strong mechanisms for cooperation and knowledge
1382 partnerships are all the more crucial. Creating synergies among the expertise and resources
1383 in different regions and institutions would allow for more efficient and equitable SDG
1384 attainment than working in silos.¹⁹⁰

1385 **Regional trends in SDG implementation and progress**

1386 Globally, there has been slow progress towards the SDGs but there have been variations
1387 between global regions.

1388 *Europe* – Europe is further away from attaining the 2030 Agenda today than it was a year
1389 ago, with a lower number of SDG targets that are on track to be achieved, though the data
1390 do not reflect the impact of the Ukraine war¹⁹¹. Even before the war in Ukraine and the
1391 COVID-19 pandemic, Europe was facing a number of challenges to sustainable development.
1392 Many countries had seen rises in income inequality and were not making sufficient progress
1393 on nutrition or sustainable food supplies. There had been improvements in access to
1394 services, such as drinking water and energy, but access to sanitation was lagging, and water
1395 quality and water-use efficiency require greater attention. On a positive note, Europe's
1396 green transition is well under way, with more renewable energy and increases in energy
1397 efficiency. But to achieve the SDGs by 2030, the pace of the transition must quicken, with a
1398 drastic cut in fossil fuel consumption. Infrastructure development for the green transition
1399 should continue, with additional investments and increased collaboration. The region also
1400 needs to increase gender equality, for example in reducing gender pay gaps, increasing the
1401 share of women in management positions, and reducing domestic violence.¹⁹²

1402 *Asia and the Pacific* – The region has progressed in some areas including access to energy,
1403 but has regressed in others, notably climate action and responsible consumption and
1404 production. With rapidly rising energy demands, the region has struggled to accelerate the
1405 transition to clean energy, and during 2020 and 2021 there was increasing investment in
1406 coal production.¹⁹³ COVID-19 caused major setbacks on poverty eradication particularly in
1407 South Asia. Additionally, 9.1 per cent of Asia's population faces hunger.¹⁹⁴ With global
1408 climate change exacerbated, the recent food and energy crises intensified inflation,
1409 adversely affecting vulnerable groups and resulting in severe socioeconomic consequences.
1410 The need to transform the energy and food systems in favour of a more inclusive,
1411 sustainable and resilient recovery is therefore crucial in the region¹⁹⁵. Meanwhile, conflicts
1412 are increasing energy costs, disrupting trade and supply chains, and causing serious damage

1413 to tourism. Moving forward will require greater investment in sustainable and greener
1414 pathways to social and economic development.

1415 *Africa* – Prior to the pandemic, there had been some progress in poverty reduction,
1416 maternal and child health, access to electricity, and gender equality. Overall, however, SDG
1417 achievements were too slow.¹⁹⁶ In Sub-Saharan Africa the rate of extreme poverty is
1418 projected to continue rising through to 2030. Many countries in the region are now deeper
1419 in debt, further increasing economic vulnerability.¹⁹⁷ Around 20 per cent of the region's
1420 population faces hunger, 22 per cent lack a basic drinking water service and 54 per cent lack
1421 basic sanitation services, exacerbating inequalities between urban and rural areas, wealth
1422 quintiles, and gender¹⁹⁸. Addressing this problem will require targeted efforts and greater
1423 contributions of ODA. The effective management of debt, as well as the reinforcement of
1424 strong domestic institutions and the localisation of sustainable development, will be key to
1425 achieve Agenda 2030 in Africa¹⁹⁹. At the same time, Africa could use COVID-19 recovery as a
1426 springboard to invest in human capital and unlock the potential capacity of its young
1427 population and build toward greener and more resilient infrastructure and industry.²⁰⁰

1428 *Latin America and the Caribbean* – This is the region most heavily affected by the COVID-19
1429 pandemic – a consequence of its large informal sector and unequal access to vaccines. The
1430 pandemic slowed economic activity, especially tourism, and reduced inflows of foreign
1431 direct investment. Particularly exposed were workers in the informal sector who cannot rely
1432 on social safety nets.²⁰¹ Most students have lost more than a year of classroom schooling.
1433 Women have suffered from increases in gender-based violence and from the unequal
1434 distribution of care work. The natural environment has also suffered from illegal destruction
1435 of marine and terrestrial biodiversity.²⁰² Slow growth in the ten years from 2014 to 2023
1436 already contributed to the undermining of many of the Sustainable Development Goals,
1437 putting many of these targets off-track and in danger of not being met. Both the economic
1438 slowdown and recent shocks are exacerbating this issue²⁰³. Economic progress continues to
1439 be hindered by structural problems including inequality, poverty and low investment and
1440 productivity.²⁰⁴

1441 *Western Asia* – In the Arab region, the COVID-19 pandemic and weak access to vaccines
1442 exacerbated existing structural barriers to achieving the SDGs. Vulnerabilities were further
1443 heightened by the war in Ukraine and associated food and energy crises, high fuel prices
1444 and tighter restrictions on access to finance.²⁰⁵ During the pandemic, the Arab region was
1445 particularly affected by falling oil prices: in early 2020, the region lost nearly \$11 billion in
1446 net oil revenues and declining oil exports.²⁰⁶ With high dependence on imports, there are
1447 concerns about food insecurity. Water stress is a growing concern in the region, as many
1448 countries are withdrawing all their renewable water resources (100 per cent) or even rely
1449 on nonrenewable resources (up to 1000 per cent) to meet their water needs, that will
1450 eventually run dry²⁰⁷. Countries in conflict have seen disruptions in humanitarian aid – a
1451 major concern for millions of refugees and internally displaced persons.²⁰⁸ This has led to
1452 increases in hunger, unemployment and poverty. At the same time, these crises could
1453 motivate governments to expand social protection, strengthen cohesion and coordination
1454 among different parts of government, and support green transformations of industry and
1455 infrastructure. The private sector, together with government, donors, and other partners,
1456 can play a key role in achieving the SDGs by 2030²⁰⁹.

Countries in special situations – The countries most vulnerable to the persistent and acute crises shaping SDG outcomes are the least developed countries (LDCs), landlocked developing countries (LLDCs), and small island developing states (SIDS). COVID-19 had deep impacts in LDCs due to weak health systems, gaps in social safety nets, and insufficient resources²¹⁰ Despite efforts of COVAX to ensure global access, recovery has been slowed by lack of access to vaccines and vaccine hesitancy. With the current food, energy and the cost-of-living crisis, the risks of poverty and hunger in LDCs are intensifying. In LLDCs, SDG progress has been hampered by broken supply chains and less access to international markets. These countries are also very exposed to climate change effects – to drought, desertification, land degradation or the melting of glaciers. During the pandemic, SIDS struggled with the sudden disappearance of tourism which caused serious drops in economic growth. In 2020, the SIDS GDP dropped by 6.9 per cent compared with 4.8 per cent in other developing countries.²¹¹ Countries struggle to address long-term concerns over rising debt and vulnerabilities to climate change, while also addressing immediate needs.

All these challenges are compounded by conflict. Countries in special situations are more likely to be net importers of energy and food supplies, increasing their vulnerabilities to global price shocks.²¹² The cost of food imports in LDCs grew by 27 per cent in 2020 and 2021.²¹³ Due to the pandemic, global trade fell by 9.6 per cent while in LDCs the loss was 12 per cent, resulting in further breaks in supply chains. These issues are likely to be exacerbated by transport and trade cost increases due to the conflict in Ukraine.²¹⁴

Fixed Goals for a world in flux

Multiple crises in recent years have meant that we are far off track on meeting the SDGs by 2030. Importantly, however, societies were on unsustainable development trajectories before these crises, indicating the need for transformative change. Without renewed efforts and ambitious action, the situation is dire. Particularly at risk are the Goals that have consistently been moving in the wrong direction like reducing hunger, curtailing global GHG emissions, ending the deterioration of coastal, inland and ground waters, and reversing the loss of biodiversity. Countries will also need to pay special attention to increasing poverty and hunger as well as gender inequality. For the second half of Agenda 2030 and in light of the war in Ukraine it is clear that progress, once attained, is not guaranteed. Goals remain vulnerable to further shocks, political or economic, or natural disasters including pandemics. Thus, progress towards the SDGs has to focus on both resilience and acceleration.

Chapter 2: Framing the future

Progress to date, at the halfway point of the 2030 Agenda, is far off track and projections show that the world will not achieve the SDGs by 2030. However, the future is not given and there is ample room for Member States of the United Nations, local government, business and other actors to take action to prepare for and shape the future – up to 2030 and beyond. This chapter looks forward at the changing context for sustainable development at the halfway point of the 2030 Agenda. It highlights important trends and conditions that will deeply affect prospects for meeting the SDGs. It reviews how SDG action and governance, while so far not showing visible results on Goal achievement, is taking root and how the SDGs offer a robust and broadly supported framework for sustainable development. Finally, it reviews new knowledge about sustainable pathways that the SDG framework has unlocked: understanding interlinkages between goals, and international spillover effects.

In the Anthropocene age humans have, for better or for worse, become the dominant geological force on the planet. Human ingenuity, resolve and commitment have enabled millions more people to live longer, healthier, and fulfilling lives. But since the industrial revolution, economic and technological progress has come at the cost of ecological destruction, and an existential threat from climate change.

To help policymakers and other actors move in the most productive ways, this chapter looks as the medium- and long-term context for achieving the SDGs, and the extent to which governments and others have taken up the SDGs to establish the long-term context for action. It then examines the latest science on how the SDGs interlink, and what we know about international spillovers related to SDGs. Although countries are at different stages of development and have their own needs, priorities, and challenges, universal science-based tools can be adapted and applied to different contexts to address common barriers and impediments and accelerate transformation towards the SDGs.

Dynamic conditions shaping SDG achievement

While dealing with immediate crises leaders and stakeholders must at the same time consider medium- and long-term developments and trends that are having a systemic effect across the SDGs and which, if unaddressed, could undermine current and future progress. Those considered in the following section are climate change, biodiversity and nature loss, digitalization, demographic change, and inequality. Other significant influences include the state of democracy and rule of law, and dangers of social disintegration, the development of artificial intelligence and deep-learning technologies, along with changes in consumption, production, and globalization, and the opportunities for financial and technical assistance.

Climate change

The global mean temperature in 2022 is currently estimated to be about 1.15°C above the 1850-1900 pre-industrial average and the world is on a trajectory toward two to three degrees warming in the next century.²¹⁵ Today's emission levels will leave young and future generations with greatly diminished carbon budgets within which to meet their own development goals.²¹⁶

1531 This trend means that the SDGs will have to be achieved, and progress maintained, in a
1532 significantly warmer world and with the prospect of extensive loss and damage.²¹⁷ All
1533 countries will need to make changes, particularly those with very high per capita emissions.
1534 All development must become more climate-resilient and adaptation measures must be
1535 significantly scaled up and enhanced to bridge the current ‘adaptation gap’. Actors need to
1536 seek to avoid ‘maladaptation’, and to address ‘loss and damage’ due to climate change.
1537 There are many limits to adaptation, soft or hard.²¹⁸ Soft limits are those when no solutions
1538 appear feasible, but might become available in the future, in coastal floodplains for
1539 example, and in places exposed to extreme heat. Hard limits are reached when adaptive
1540 actions are ineffective and there are no additional options, as with the loss of coral reefs,
1541 coastal wetlands, rainforests, polar and mountain ecosystems.²¹⁹ Mitigation measures and
1542 low-carbon innovation must also increasingly account for a changing climate, through
1543 developing integrated approaches. Fortunately, there are synergies and co-benefits for
1544 many SDGs by taking action on mitigation and adaptation, that can lead to ‘triple wins’
1545 under carbon-neutral, climate-resilient development pathways.²²⁰

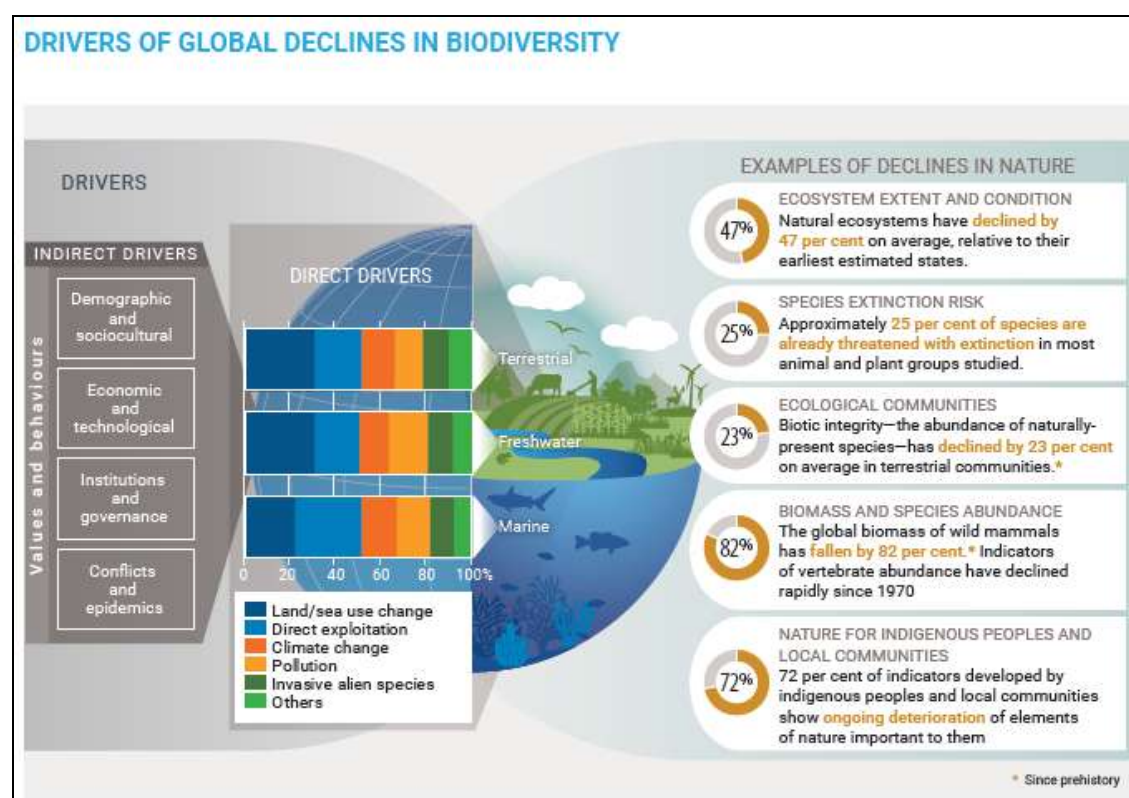
1546 With momentum for decarbonization, the climate transition must be managed well to
1547 ensure that it is just, equitable and orderly. Vulnerable groups must be protected and
1548 economic diversification is needed to avoid disruption and high exposure to ‘stranded
1549 assets’. Actively seeking synergies and co-benefits with other SDGs may serve to build social
1550 acceptance for climate transition measures, such as fossil fuel subsidy reform.

1551 *Biodiversity and nature loss*

1552 Over recent decades, increases in production and consumption have been accompanied by
1553 a serious loss of biodiversity and degradation of nature – human activities have altered 75
1554 per cent of the world's land surface and 66 per cent of ocean areas (

1555 Figure 2-). More than 85 per cent of wetlands have been lost. About 25 per cent of all
1556 assessed plant and animal species, around one million, face extinction, with amphibians
1557 particularly at risk.

Figure 2-1: Drivers of global declines in biodiversity



Source: IPBES, 2019

This loss of biodiversity has huge implications not just for the natural world but for human health and wellbeing.²²¹ Genetic diversity enables crops and livestock to adapt to changing environmental conditions and provides resilience against diseases, pests and parasites. According to the World Economic Forum, in 2019 nature supported around half of global GDP, especially in construction, agriculture, and the food and beverage industries. Unless countries stop degrading nature, the achievement of any SDGs will be short-lived. But from integrated approaches like nature-based solutions, action taken to protect and restore nature can have multiple benefits across many SDGs²²².

The digital transformation

Digitization is the process of converting analogue information into a digital format so that it can be electronically stored, processed, managed, and transmitted – for example, the conversion of analogue music to MP3 files. A related term, digitalization is the process of using digital technology and data to improve business processes, models and productivity. Both digitization and digitalization feed into the broader societal change that is 'digital transformation' – a new development paradigm that incorporated many disruptive technologies including faster connectivity and networks, Artificial Intelligence (AI), the manipulation of big data, and the Internet of things.²²³

The digital transformation has already brought profound social benefits with opportunities to build more inclusive societies. Digitization can make essential goods more affordable and help diversify to cleaner energy production and water supplies.^{224 225 226} Human beings can now process and store massive amounts of information and study and shop online.

Digitalization enables different groups to work together through low-cost communication systems. Digital systems for the provision of government services (e-government) allow users easy access to social protection programmes and benefits such as maternity care, child subsidies, pensions, and housing and food allowances; and can enable dynamic responses and service provision during crises like the COVID-19 pandemic.²²⁷ They can also target people living in poverty, persons with disabilities, older individuals, immigrants, women, and youth.

Moreover, digitization can improve the urban environment. Policymakers and other stakeholders can gather data to improve city management. And rather than using cars, city dwellers can telecommute saving energy and reducing carbon emissions.²²⁸ They and people living in peri-urban and rural areas can install smart-energy saving home control systems. They can also improve access to health care through teleconsultation services.²²⁹ Likewise, digital technologies are useful for spatial planning. In the ocean, for example, technologies such as remote sensing, artificial intelligence, and machine learning are already providing valuable data for marine spatial planning. In short, digitalization can help bring visibility to important issues by making things measurable; it can help identify where people are left behind and what types of resources are needed.

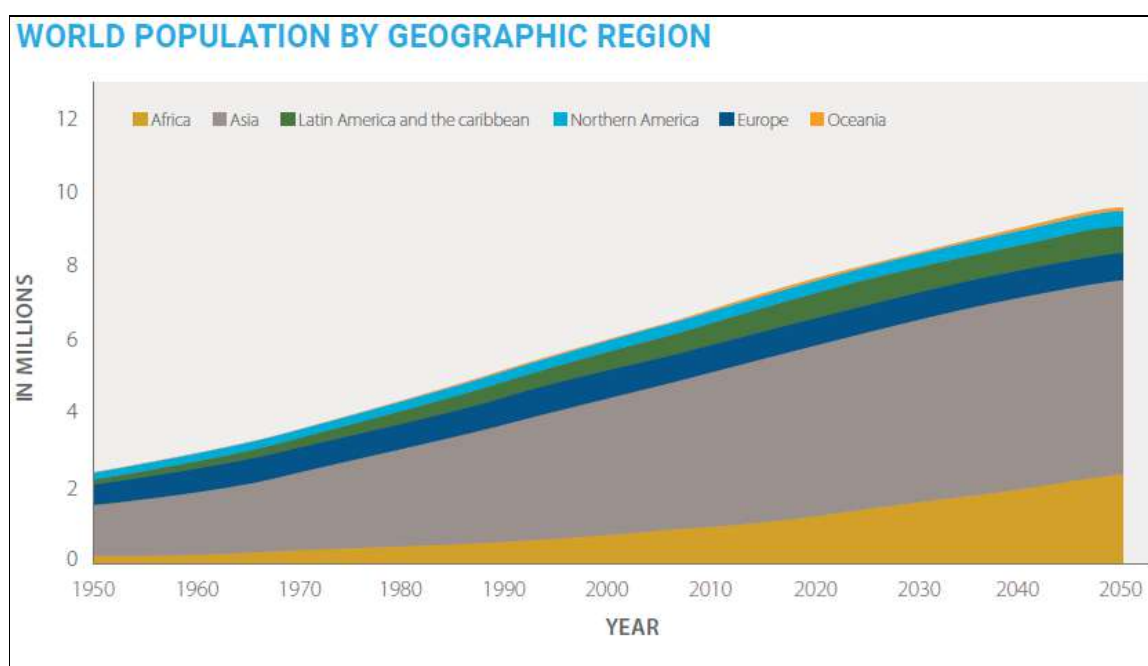
However, the benefits of digital transformation to communities and individuals have been uneven. Over 60 percent of the world's population is now online, but fewer women than men have access, and access is much higher in high-income than in low-income countries. In LDCs, fixed broadband has only 1.4 subscriptions per 100 inhabitants.²³⁰ As education, work, and public services move onto digital platforms, divides in access to crucial services could deepen. In addition, while the increasingly sophisticated and powerful digital transformation provides new opportunities to reach the SDGs, risks such as the misuse of AI to spread misinformation or inaccuracies should be carefully addressed. Potential legal and ethical issues around privacy, as well as data collection and biases that tend to be built into machine learning technologies, also require attention.²³¹

Demographic change

Global population continues to grow, albeit at a slower pace than in previous decades (figure 2-2). Since the turn of the century, annual global population growth has fallen from 1.3 to 1.0 per cent. In 2022, world population reached the milestone of 8 billion; by 2030, that number is set to reach 8.5 billion.

More than half of the world's population are in just seven countries: India, China, United States of America, Indonesia, Pakistan, Nigeria, and Brazil. By 2050, around half of world population growth will come from nine countries – Democratic Republic of Congo, Ethiopia, Egypt, Nigeria, United Republic of Tanzania, Pakistan, India, and the Philippines. By the end of 2023, India's population will exceed 1.43 billion people, overtaking China as the most populous country in the world. On the other hand, most countries in Europe, North and South America and Eastern Asia have annual population growth rates below one per cent, or even declining.²³²

Figure 2-2: Projected world population by geographic region



Source: 2022 Revision of World Population Prospects

In addition to considering population size, a long-term perspective on SDG action must consider population age structures, fertility rates, ageing and rural-urban distributions – all of which have important implications for the SDGs. For example, countries that reduce their fertility rates rapidly can benefit from a ‘demographic dividend’, which is a temporary economic phenomenon resulting from a favourable age-structure of fewer young dependents relative to people in the economically productive ages. If countries take advantage of this temporary phase by investing in the wellbeing and capabilities of their workforces, along with economic reforms and increasing investment, this can yield huge economic benefits.^{233, 234 235 236}

Another major demographic change is population aging. Many East Asian countries, including Singapore, Republic of Korea and China, and most countries in Europe, now have fertility rates below the replacement level of 2.1. births per woman. At the same time people are living longer; the life expectancy at birth has increased by an average of about five years since 1990. The outcome is ‘ageing societies’ with fewer workers supporting an increasing population of older dependents – an imbalance that makes it more difficult to finance social protection and can dampen economic progress.

A third major demographic trend with implications for the SDGs is urbanization. In this case the pattern differs between developing and developed countries. Developing countries typically have lower levels of urbanization, and their cities are still expanding with the arrival of urban migrants but often without concomitant expansion of housing and basic water and sanitation services. The developed and emerging economies, on the other hand, typically have high levels of urbanization, with long-established cities that are relatively complete and close to saturated, with wide coverage of infrastructure and services. However, if they

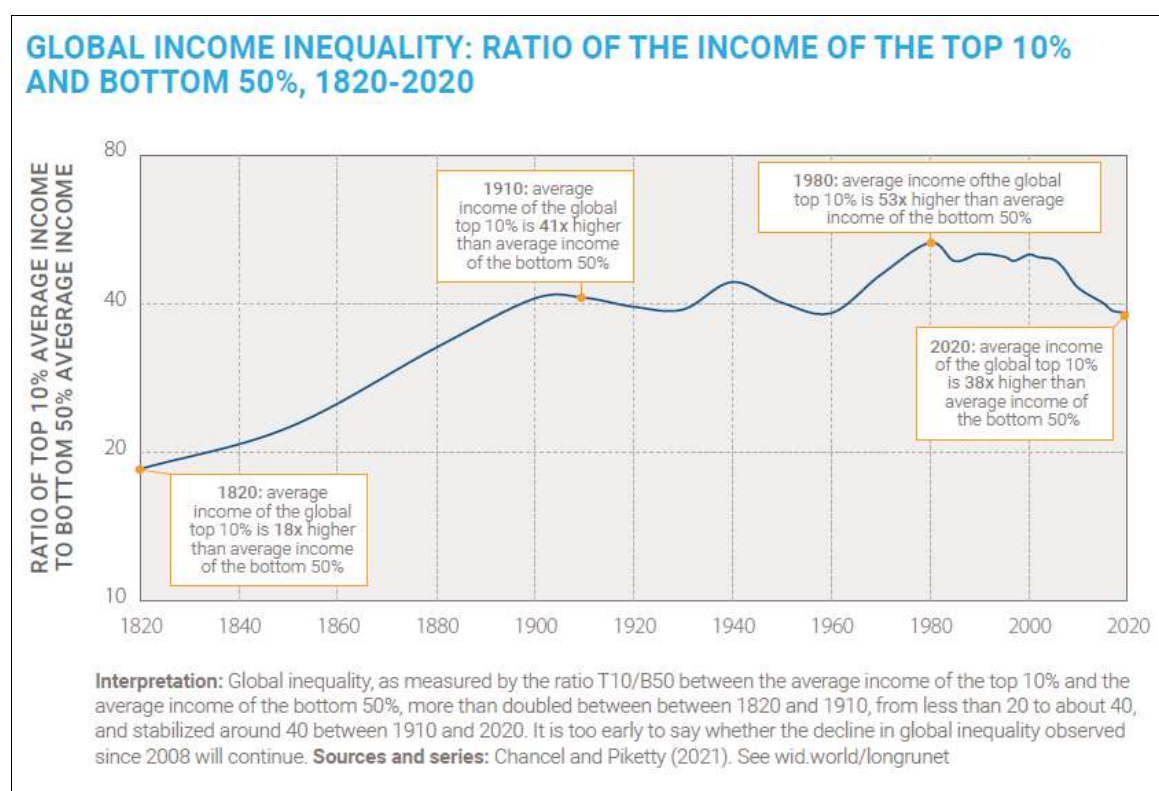
are to survive as liveable spaces, well established cities must continuously renew their built-up environments and boost the productivity of their industries and services. ^[237]

Economic inequality

Inequality in the distribution of resources and opportunities features in many aspects of human life but the most commonly measured dimension is inequality in income. Over the past two decades, income inequality has increased within most countries while global inequalities between countries have declined. Today, income inequality is as high as it was at the start of the 20th century (Figure 2-3). The richest 10 per cent of the global population takes 52 per cent of global oncome, while the poorest half earns 8.5 per cent of it. ²³⁸

Recent shocks including the COVID-19 pandemic have pushed inequality higher. The Global Gini coefficient increased by about 0.5 points from 2019 to 2020. ²³⁹ Given that many low-income countries are in fragile situations, facing high inflation and debt distress, between country inequality could begin to widen.

Figure 2-3: Global income inequality, ratio of top 10 per cent to bottom 50 per cent, 1820-2020

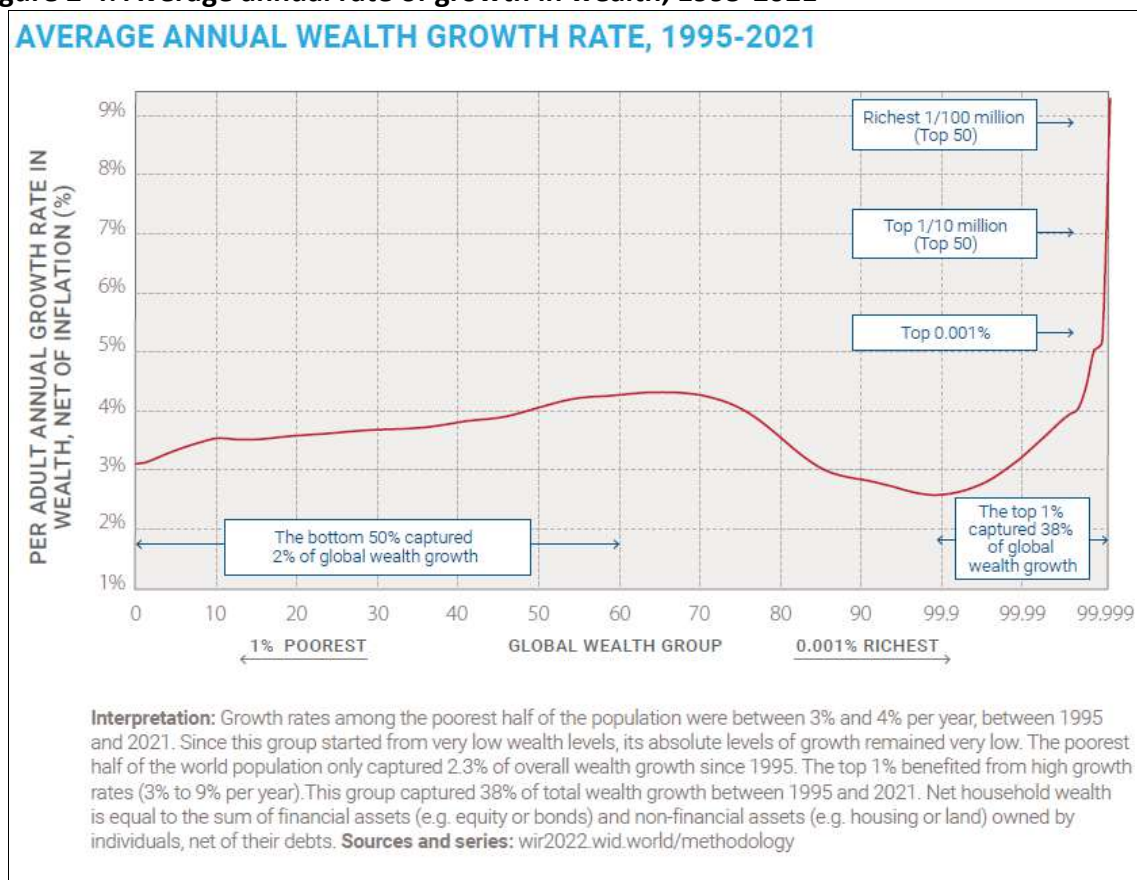


Source: World Inequality Report, 2022

Less easy to measure, but potentially more impactful in shaping life opportunities and outcomes for individuals and groups; wealth inequality has been increasing starkly in recent years (figure 2-4). The richest 1 per cent globally captured nearly two-thirds of all new wealth worth \$42 trillion created since 2020. This comes on top of a decade of historic gains. The number and wealth of billionaires has doubled over the last ten years. ²⁴⁰ In addition, in some parts of the world private wealth is increasing faster than public wealth

with implications for public spending on SDG implementation or tackling crises impacting the public at national or global levels whether climate change or conflict or threats to public health.²⁴¹

Figure 2-4: Average annual rate of growth in wealth, 1995-2021



Source: World Inequality Report, 2022

Some groups are also faring much better than others. The World Inequality Report 2022 estimates that women's share of total income from work (labour income) is around 35 per cent when it should be 50 per cent in a gender equal world, and has not changed in the past three decades.²⁴² On the other hand, girls and women bear the brunt of unpaid care and domestic work, creating large gender inequality for unpaid care work. Many of the inequality indices rely on estimates from a limited number of countries and/or modelled data. More high-quality data are needed for better tracking of within-country and gender inequalities.

SDG 10 aims to reduce inequalities within and between countries. But inequality also has serious consequences for the achievement of many of the other SDGs. Unequal societies tend to be less environmentally sustainable with higher social tensions. There is also the danger of elite capture of government that weakens public policies, as well as the loss of public resources through tax evasion, with wealth transferred out of the country to tax havens. Considering that inequalities can generate unrest, violence and conflict; there are also strong synergies to be leveraged between reducing inequality and furthering progress toward peaceful communities.

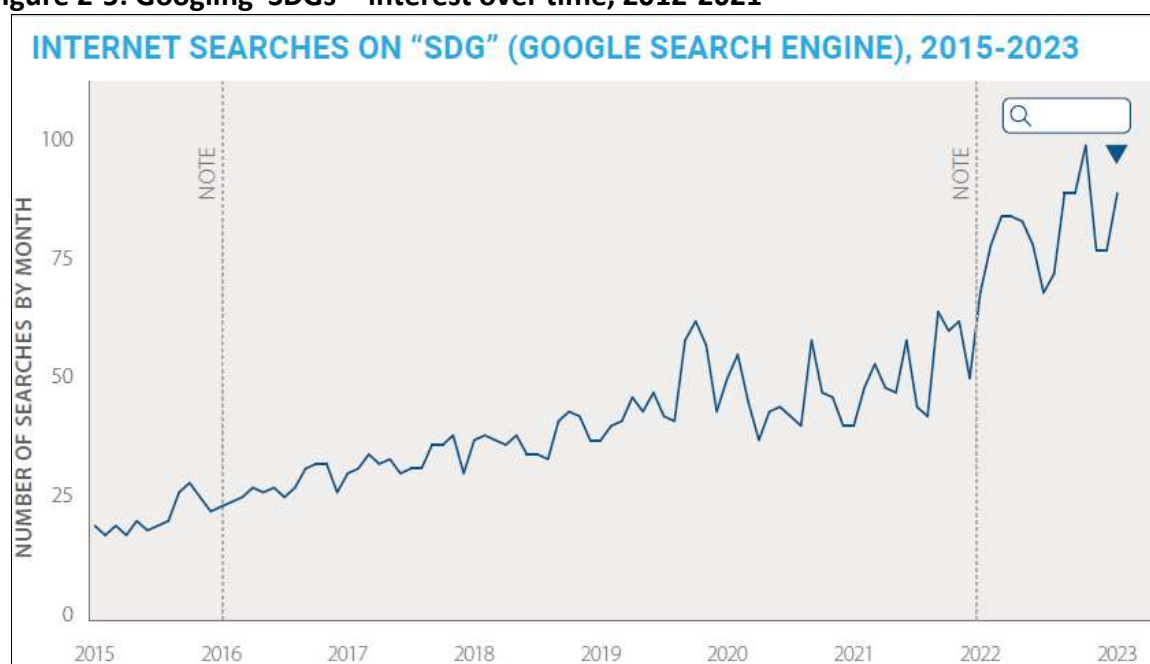
Greater awareness and uptake of the SDG framework

While many conditions and circumstances are making it more difficult to attain the SDGs, in some respects, the prospects for achieving the Goals have improved. More people and organizations have learned about the SDGs and support them. And governments and other institutions are integrating the SDGs into existing legislation and frameworks.

Knowledge and awareness of SDGs

Over time, the public has become more aware of the SDGs and are thus in a better position to press governments and businesses to support them and put pressure on companies to operate more sustainably.²⁴³ One indicator of increasing awareness and general interest in the SDGs is the number of times they appear in Internet searches (Figure 2-5).

Figure 2-5: Googling 'SDGs' - interest over time, 2012-2021



Source: Google Trends (<https://trends.google.com/trends/>)

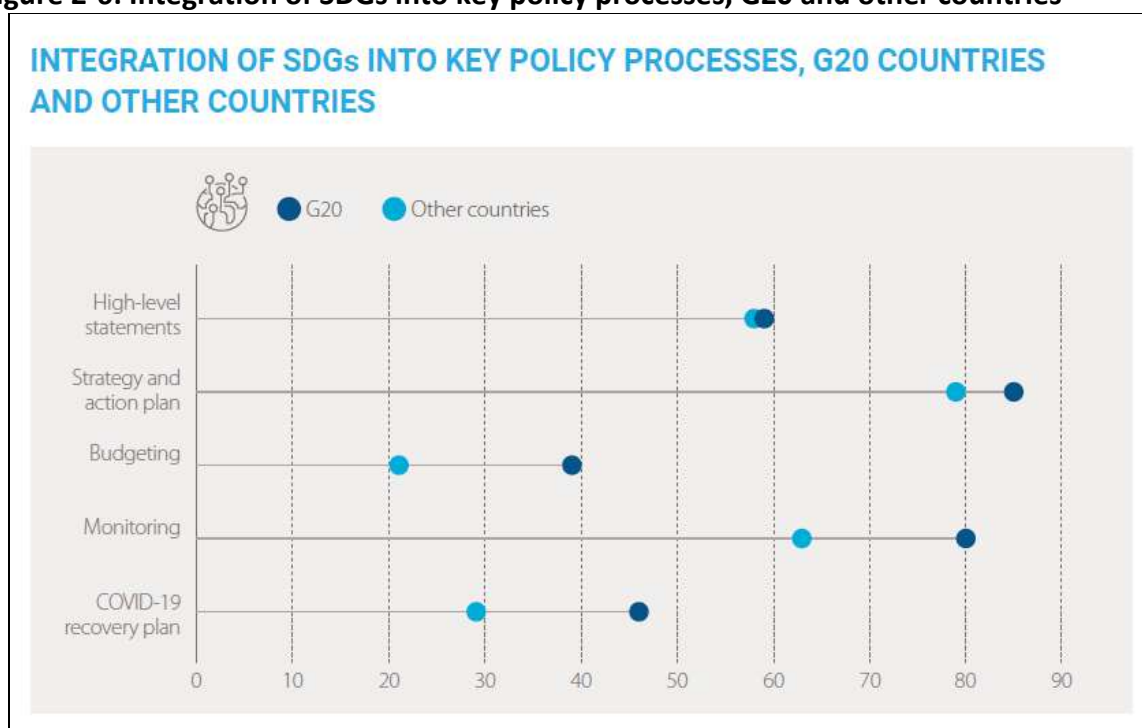
Note: Interest over time represents Google searches for 'SDGs' as a proportion of all searches. It does not show the absolute proportion, but rather the trend over time as a percentage of the maximum achieved. For the SDGs, the maximum proportion was reached in March 2021 which is the value set at 100. Thus since 2015 the interest by this measure has roughly quadrupled.

Knowledge about the SDGs is further demonstrated in opinion surveys, though as yet there are no data for a time series. In 2019, one survey of 27,000 people in 174 countries found that almost half of respondents were aware of the SDGs; respondents considered the three most important Goals to be SDG13 (climate action), SDG3 (health) and SDG 4 (education).²⁴⁴ In 2021, a survey of 20,000 respondents in 28 countries found that the three priority Goals were SDG2 (hunger), SDG1 (poverty) and SDG3 (health), but when it came to achieving the Goals more than half of respondents thought their governments were taking less than their share of responsibility.²⁴⁵ In addition, as indicated in Chapter 4, there has been substantially more academic research. Researchers, funders and academic institutions are increasingly using the SDGs to frame their research, teaching and societal outreach strategies. The SDG framework has inspired much new science, and there is a wealth of SDG-related knowledge and evidence to draw on.

Aspirations, commitments and partnerships

Likewise, broad support can be found when it comes to aspirations and new initiatives from many actors. A recent survey of 60 countries showed that by 2021, 75 per cent of governments had developed SDG strategies and action plans, though this did not show levels of resources and responsibilities for implementation (figure Figure 2-6).²⁴⁶ G20 countries on average have been less ambitious than other countries despite representing the majority of the world's population and income. The same survey indicated that over half of the sample countries had official speeches by the head of government mentioning the SDGs. Another indicator of SDG commitment is the setting of nationally adapted targets as has happened in Denmark²⁴⁷, or developing a national level Sustainable Development Act or Law as the case in Canada or the Republic of Korea.^{248,249,250,251} Finally, some countries and regions have integrated SDGs in their high-level development strategies: China incorporated the SDGs in its 13th and 14th Five Year Plan and 2035 development targets²⁵² and the African Union has linked the SDGs with its Agenda 2063.²⁵³

Figure 2-6: Integration of SDGs into key policy processes, G20 and other countries



Source: Sachs et al. (2022a) Sustainable Development Report 2022: From Crisis to Sustainable Development

Local governments have been particularly active in engaging with the SDGs. Local governments have legal and fiscal responsibility for a number of SDG targets and can be more resilient and politically sustainable with stakeholders recognizing mutual interdependence and to the value of shared problem-solving.²⁵⁴ These include, for example, the Local 2030 Coalition, SDG Cities hosted by UN-Habitat, the OECD Roundtable on Cities and Regions, and the ICLEI Local Governments for Sustainability network. The number of Voluntary Local Reviews (VLRs) has grown steadily²⁵⁵. Civil society organizations have also been strengthening communities and voices and holding others accountable.²⁵⁶ In addition there have been SDG commitments and pledges from the private sector, – as with the Science-Based Targets initiative bring businesses' emissions reduction targets in line with climate science, further spurred on by the global net zero emission objective and targets for

other environmental goals. And voluntary reporting of ESG metrics (Environmental, Social, Governance) has skyrocketed in recent years rising from 35 per cent of firms in the S&P 500 releasing reports in 2010 to 86 per cent in 2021.²⁵⁷

Beyond promises by individual governments and organizations, there have also been voluntary commitments through new, multi-stakeholder partnerships. The UN partnership platform has registered over 7,700 partnerships across the SDGs representing concrete measures for different groups to work together to achieve the 2030 Agenda (Figure 2-7).²⁵⁸

Figure 2-7: Number of partnerships registered by SDG



Source: <https://sdgs.un.org/partnerships>, accessed June 6 2023. Some partnerships involve more than 1 SDG.

SDG integration into decision-making

Aspirations and commitments have to some, but limited extent been translated into institutional mechanisms by integrating SDGs into existing legislation and frameworks. By 2022, most countries in a survey of 60 had a lead unit or agency responsible for the SDGs, though less than one-third of these were at the centre of government.²⁵⁹ Only a few countries, such as Bangladesh, Denmark and Germany, set national SDG targets, per paragraph 55 of the 2030 Agenda.^{260, 261, 262, 263} A review of 137 Voluntary National Reviews (VNRs) submitted between 2016 and 2019 collected self-reported SDG scores on five criteria – political leadership, horizontal coordination, vertical coordination, variable horizontal accountability, and societal participation and social accountability. Only three countries had the highest score across all criteria. Countries tended to perform best on horizontal coordination by having more than two line ministries represented in the SDG body, and on political leadership by having this body led by the centre of government. Scores tended to be low on vertical coordination and accountability.²⁶⁴ A review in Latin America showed that ten countries had created new institutional arrangements such as commissions or councils, and six countries had reformed existing institutions.²⁶⁵

There is substantial scope for integrating the SDGs more strongly and consistently in measurement and policy impact assessments across sectors.²⁶⁶ For example, the EU Impact Assessment Guideline and Toolbox refers to the SDGs and their indicators for assessing the impact of proposed legislation.²⁶⁷ It does take time for institutional innovations to have effect though, and so far, there is not strong evidence that the SDGs have improved policy

1787 coherence. Often governments are not providing adequate mandates or resources and lack
1788 the political will to face difficult trade-offs or choices for long-term sustainability and instead
1789 cherry-pick among Goals in line with prior agendas.²⁶⁸

1790 Similar weaknesses exist at the local and regional government level, but there is some
1791 evidence of innovation.²⁶⁹ Malmö in Sweden and several cities in Japan for example, have
1792 formed administrative units to integrate participatory policymaking for the SDGs.²⁷⁰
1793 Shimokawa city in Japan created a Shimokawa Version of the SDGs, with a future-oriented
1794 policy package.²⁷¹ And in Accra, Ghana, an SDG investment fair was organized to encourage
1795 private investments in the SDGs.²⁷²

1796 International organizations and institutions too have widely adopted the SDGs and aligned
1797 their policy agendas accordingly.²⁷³ For marine plastic waste, for example, the United
1798 Nations framed this as an issue not just for SDG14 but also of SDG12 and aimed to involve
1799 the waste management community.²⁷⁴ Institutional changes have been more extensive and
1800 rapid compared with the Millennium Development Goals, but global sustainability
1801 governance is still quite fragmented with mandates, practices and resource allocation in
1802 international organizations remaining fragmented in some cases relative to the integrated
1803 nature of the SDGs.²⁷⁵

1804 The private sector has increased its engagement through, for example, SDG-aligned business
1805 strategies and business sector targets and roadmaps, corporate sustainability programmes,
1806 public-private partnerships, and impact-investing.²⁷⁶ It is still difficult to assess private
1807 sector contributions and to detect ‘SDG-washing’ for example through initiatives that have
1808 little to no actual impact on SDGs.

1809 A key feature of governance and institutions for the SDGs is inclusiveness. In Brazil, the
1810 National Commission for the SDGs includes substantive participation from non-state actors
1811 – similar to Finland’s National Commission. Overall, however, while there have been efforts
1812 to instil the ‘leave no-one behind’ principle in governance, in practice countries are still
1813 failing to target marginalized groups.²⁷⁷

1814 Overall, awareness and uptake of the SDGs as a guiding framework is taking root, but not
1815 yet at the level that leads to visible results on goal attainment. In the second half of Agenda
1816 2030, actors can integrate the SDGs into their core decision-making processes and
1817 institutions more and strengthen the accountability for making progress.

1818 **Interlinkages between the SDGs and international spillovers**

1819 Addressing challenges such as climate change, biodiversity loss, and rising inequality
1820 requires balancing environmental, social, and economic objectives. The 2030 Agenda offers
1821 a comprehensive framework to think about these challenges in a systematic and integrated
1822 way. Although the SDGs are defined individually, their design clearly includes many
1823 interlinkages and spillovers. Indeed, the 2030 Agenda states that the SDGs should be
1824 treated as an integrated and indivisible whole. Science has responded enthusiastically in
1825 identifying, characterising and quantifying these interlinkages, with substantial progress
1826 since 2019. This section reviews the most up-to-date science published between 2019 and
1827 2022 on how deeply interconnected the SDGs are, including through transborder
1828 connections, and what this means for SDG action (for further detail, see Appendix 1).

The interlinkages between the SDGs work in different ways. Some interlinkages involve trade-offs, as when carbon offsetting projects can threaten local livelihoods. Others are synergistic, as when better education for women, for example, improves child health (Box 2-1 includes additional examples). Understanding SDG interlinkages enables governments to prioritize and leverage the impacts of SDGs and targets that have strong synergistic or systemic effects across all Goals. Knowledge about interlinkages also makes it possible to account for and manage actions to achieve SDGs and targets that may involve conflicts and trade-offs, through compensatory measures.

Box 2-1: SDG synergies and trade-offs linked to clean energy

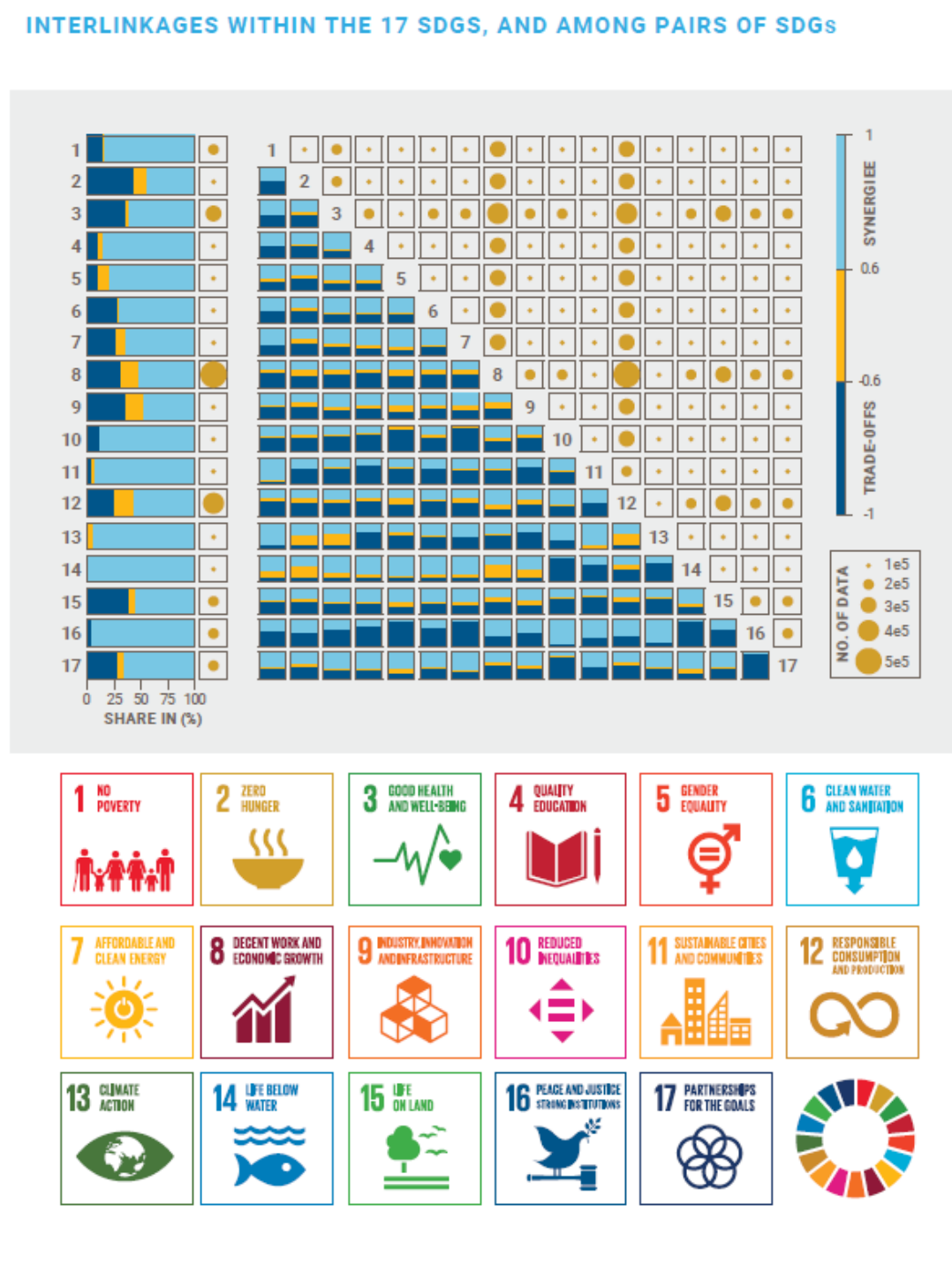
The interconnectedness of the SDGs can be used to boost progress in multiple areas. For example, a study in Tanzania²⁷⁸ shows how investments in photovoltaics directly enable progress on SDG 7 (affordable and clean energy), but how such investments can indirectly support progress also on SDG 4 (education) as students can spend more time on their studies with access to better quality light. Further, investments in photovoltaics could reduce indoor air pollution as it allows phasing out the use of solid fuels for cooking, enabling progress on SDG 3 (good health and well-being). Hence, investing in solar energy ends up supporting progress on three SDGs simultaneously.

On the other hand, some SDG interlinkages are associated with trade-offs or conflicts. For example, large-scale investments in renewable and clean energy are key to combating climate change. However, the transition to renewable and clean energy technologies is largely reliant on critical minerals such as copper, lithium, cobalt, and rare earth elements. If not managed properly, efforts to meet the increasing demand for such critical minerals can lead to negative social and environmental impacts. These negative impacts include significant greenhouse gas emissions from mining and processing, biodiversity loss, water pollution, human rights violations, and work-related fatalities and injuries²⁷⁹. Hence, if these trade-offs are not carefully managed, clean energy transitions could undermine progress on several SDGs, including SDGs 8 (decent work and economic growth), 14 (life below water), and 15 (life on land).

SDG synergies and trade-offs

The 2019 Global Sustainable Development Report included an analysis of SDG interlinkages. The findings highlighted that most SDGs are synergistic, stressing that both social and environmental Goals have systemic impacts that drive overall SDG progress. Since 2019, the literature on SDG interlinkages has grown rapidly. Several studies reaffirm that SDG synergies outweigh trade-offs (see an illustrative example in figure 2-8). There is high and not yet fully tapped potential for making simultaneous progress on multiple SDGs, through integrative policy planning and business strategies. For example, progress on SDG 5 (gender equality) is also linked to economic development. One study in 2019 found that accelerating progress on gender equality in Africa could boost African economies by the equivalent of 10 percent of their collective GDP by 2025.²⁸⁰ In the recent literature on SDG interlinkages, seven SDGs come across as particularly synergistic: SDG 1 (no poverty), SDG 3 (good health and well-being), SDG 4 (quality education), SDG 5 (gender equality), SDG 6 (water and sanitation), SDG 7 (clean and affordable energy), and SDG 17 (partnerships). These goals are repeatedly associated with co-benefits or identified as drivers of progress. Hence, strategic interventions targeting these synergistic Goals could generate simultaneous progress and important gains on several other Goals.

Figure 2-8: SDG interlinkages create synergies and trade-offs



Results from an illustrative study of SDG interlinkages. Note: Interactions within the 17 SDGs (left) and among 136 SDG pairs (right) based on SDG data from 2018 (United Nations Statistics Division 2019). The shares of synergies (blue), non-classifieds (yellow), and trade-offs (orange) are represented by the colour bars. The number of data pairs of SDG indicators is depicted by the areas of the circle in the boxes. Here, 1e2, 1e3, 1e4, 1e5, and 5e5 are 100, 1,000, 10,000, 100,000, and 500,000, respectively. Source: Anderson, C.C., Denich, M., Warchold, A. *et al.* A systems model of SDG target influence on the 2030 Agenda for Sustainable Development. *Sustain Sci* 17, 1459–1472 (2022).

There are also important trade-offs that must be actively managed and accounted for in policy. For example, business-as-usual strategies to promote targets belonging to SDGs 2 (zero hunger) and 8 (decent work and economic growth) carry risks of undermining SDG

1882 progress in other areas. For instance, actions to meet SDG 2 might generate competition
1883 and conflict for cultivated land and intensive agricultural practices can lead to soil
1884 degradation, pollution, and biodiversity loss. SDG 8 promotes sustained economic growth
1885 which can create negative impacts, as when growth in economic activities leads to natural
1886 resource exploitation exceeding sustainable limits.

1887 Further, the literature on SDG interlinkages shows that SDGs 14 (life below water) and 15
1888 (life on land) seem to be most negatively affected by progress in other areas²⁸¹. The 2030
1889 Agenda builds the conflict between socioeconomic and environmental Goals into the SDGs
1890 but leaves it to policymakers to resolve. Chapter 6 gives examples of actions that may help
1891 manage the inherent trade-offs in the 2030 Agenda, including suggestions to employ
1892 alternative measures to GDP for measuring human progress and welfare, and to promote
1893 multifunctional agriculture, scale up agro-ecological practices, scale down resource use,
1894 lower inequality, and develop integrated public-, business-, and innovation policy solutions.

1895 *Context specific variations in SDG interlinkages*

1896 The nature of SDG connections differs between contexts and over time²⁸². Patterns of trade-
1897 offs and synergies vary significantly by region, country groupings and population groups. For
1898 example, poverty reduction seems to generate compound positive effects on the 2030
1899 Agenda in low-income countries, while integrated strategies that tackle climate change and
1900 inequality are more decisive to overall SDG progress in high-income countries.²⁸³

1901 On the whole, high-income countries appear to face more trade-offs than low-and middle-
1902 income countries, which could partly explain their slow rate in improving SDG progress.²⁸⁴
1903 Policymakers in high-income countries need to identify mechanisms to identify and address
1904 trade-offs. For low-and-middle-income countries, a relatively high share of synergies means
1905 that progress on one SDG is likely to have co-benefits with others, and a lower risk of
1906 undermining progress in other areas.

1907 The distribution of trade-offs and synergies also differs between population groups. For
1908 example, synergies appear to be higher for female, younger, and rural populations for
1909 whom trade-offs are more negligible. In other words, progress on an SDG indicator for these
1910 groups will generally foster progress for the group on other SDG indicators. Women and
1911 girls, youth and rural populations face disadvantages in many contexts; removing barriers
1912 for these groups is an important step to leveraging synergies in the 2030 Agenda, in line
1913 with the pledge to “leave no one behind”.²⁸⁵

1914 The different patterns of trade-offs and synergies across regions, income-, and population
1915 groups call for context-specific and disaggregated analysis to support SDG implementation.
1916 Further, it warns against global benchmarking and instead encourages goal-setting that
1917 considers regional challenges and opportunities.²⁸⁶

1918 *Interventions must address SDG interlinkages*

1919 A better understanding of patterns of synergies and trade-offs can support strategic
1920 decision making and promote game-changing interventions for the SDGs. Here, the scientific
1921 community can help by carrying out comparative analysis and creating data repositories.

1922 Overall, there must be a stronger focus on understanding SDG interlinkages in relation to
1923 specific policy proposals, to complement scientific research on general patterns. For
1924 example, the EU Impact Assessment Guideline and Toolbox refers to the SDGs and their
1925 indicators as a framework for ex-ante assessing a new policy's impact.²⁸⁷ There is substantial
1926 scope for integrating the SDGs more strongly and consistently in existing and legally
1927 required impact assessment procedures globally, including in policy impact assessment,
1928 regulatory impact assessment, and environmental/social/health impact assessments.²⁸⁸
1929 Similarly, private sector decisions – both strategic and operational – could take systematic
1930 consideration of impacts across SDGs.

1931 The availability of tools and methods for integrated SDG analysis and decision support has
1932 grown in recent years, and the process of identifying and evaluating positive and negative
1933 interlinkages can boost learning and creativity.²⁸⁹ Researchers and policymakers should be
1934 encouraged to work together to leverage existing knowledge and tools and to design
1935 interventions that maximize synergies, mitigate trade-offs, address uncertainties, and
1936 consider context-specific challenges and opportunities.

1937 *International SDG spillovers*

1938 Most of the Goals and targets can have spillovers – defined as ‘any effect – intended or not
1939 – originated in one country that crosses national borders through flows of capital, goods,
1940 human and natural resources, and that is able to affect positively or negatively the
1941 sustainable development prospects of another country.’²⁹⁰ Analysis by the Organisation for
1942 Economic Co-operation and Development (OECD) suggests that as many as 57 per cent of all
1943 169 SDG targets have transboundary components.²⁹¹ To accelerate progress on the SDGs,
1944 countries cannot afford to generate negative and costly impacts elsewhere. Failing to
1945 recognize positive spillovers, however, leads to missed opportunities.

1946 One long-evident spillover, for example, is from education. Creating an educated and skilled
1947 workforce not only underpins national development in the educating country, but also,
1948 through temporary or permanent migration, spills over to the destination economies and
1949 communities – though this may be regretted by the educating country as a brain drain.

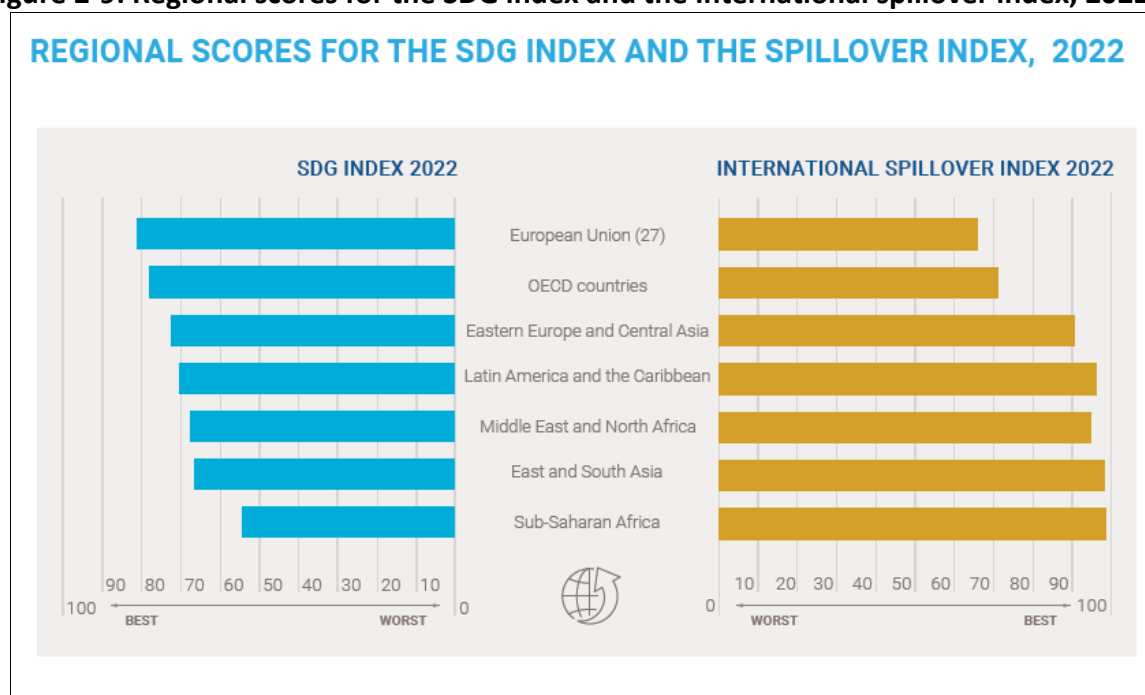
1950 An example of a generally negative spillover is ‘embedded carbon’ – which is carbon
1951 emitted for the production of goods that can subsequently be exported.²⁹² The five BRICS
1952 countries – Brazil, Russia, India, China and South Africa – for example, are net exporters of
1953 embedded carbon, accounting for 13.5 per cent of total emissions, while the OECD countries
1954 are net importers of carbon – with 13 per cent of total emissions.²⁹³

1955 In addition, there have been damaging spillovers from the COVID-19 pandemic which has
1956 disrupted global supply chains and caused losses in tourism in low-income countries.²⁹⁴ The
1957 pandemic and its spillovers have set back overall SDG implementation, though the full
1958 impact on global sustainability is still unfolding.

1959 Transboundary impacts can be tracked using a ‘spillover index’ that considers direct cross-
1960 border flows of air and water, and the environmental and social impacts embodied in trade,
1961 economy and finance, and security (**Error! Reference source not found.**9)²⁹⁵. A higher score m
1962 eans that a country causes more positive, and fewer negative, spillover effects. The related
1963 SDG index in figure 2-9 communicates overall progress in the region on achieving the SDGs

with a higher score indicating greater progress towards the SDGs. The figure indicates that although Sub-Saharan Africa has lower achievements on the SDGs on average than other regions, it is also the source of fewer negative spillovers than other regions. For OECD and EU countries the opposite is true – countries on average have the highest SDG achievements, but also impose more costs on other countries that are not internalized in their national measures of SDG progress. On average, more negative spillovers are generated by high-income countries, to the detriment of low-income countries.

Figure 2-9: Regional scores for the SDG index and the International spillover index, 2022



A comparison between the regional average SDG Index score (<https://dashboards.sdindex.org/rankings>) and the International Spillover Index score (<https://dashboards.sdindex.org/rankings/spillovers>). The comparison illustrates how countries perceived to perform well on the SDGs nationally are the same countries that hamper SDG progress elsewhere. Source: Sachs, J., Kroll, C., Lafortune, G., Fuller, G., & Woelm, F. (2022a). *Sustainable Development Report 2022* (1st ed.). Cambridge University Press. <https://doi.org/10.1017/9781009210058>.

For identifying and analysing spillovers, promising methods and examples of their applications include the use of input-output analysis to assess transboundary impacts of the EU's food supply chain²⁹⁶, the use of a computable general equilibrium economic model to understand the transboundary impacts of implementing the Paris Agreement, a scoping study of the ability of the SDG synergies tool to measure international spillovers, and discussions on the relevance of life-cycle analysis for assessing transboundary impacts in the context of SDG 12²⁹⁷. The thinking about international spillovers can also be supported by various conceptual frameworks.²⁹⁸

The need to tackle international spillovers is increasingly recognized by policy makers. The EU, for example, is taking action to reduce negative environmental and social impacts across supply chains²⁹⁹ and is also presenting its first Voluntary Review which covers the topic of international spillovers. The Voluntary National Reviews of Finland in 2020, Sweden in 2021, and the Netherlands in 2022 recognized the importance of tracking and addressing international spillovers³⁰⁰. Consumption-based CO2 emissions targets have been adopted at the city level, as in San Francisco, Paris, and Portland.³⁰¹

1992 **Framing a future of progress**

1993 While progress to date is not on track, this chapter showed that actors from all sectors of
1994 society can intensify and accelerate their efforts for sustainable development in the second
1995 half of Agenda 2030. Recent science and assessment show that our societies and economies
1996 can expect major change, that has already been started and to some extent locked-in – such
1997 as climate change, biodiversity loss, and demographic change. But depending on how these
1998 trends and changing conditions are tackled, there are also many wins across a broad
1999 spectrum of SDGs. The SDG framework has not only inspired new knowledge and ways of
2000 systematically identifying positive and negative interlinkages. It has also led to a plethora of
2001 initiatives, partnerships and commitments that can be intensified and delivered upon in the
2002 second half of Agenda 2030.

2003

2004 Chapter 3: Pathways to achieve the SDGs

2005 Business as usual will not deliver the SDGs by 2030 or even 2050, yet the SDGs are the
2006 survival kit behind the transformation process that the planet needs. Global scenario
2007 projections reveal plausible future pathways where rapid progress can be made towards
2008 the SDGs. Harnessing these opportunities will require an increased level of ambition,
2009 transformative policies, and an integrated approach to organise and coordinate efforts.
2010 Using a framework of entry points and levers, countries can strategically embark on six
2011 systems transformations to achieve the SDGs. This chapter highlights important shifts and
2012 interventions that could accelerate these transformations sourced from global scenario
2013 projections. There are opportunities for rapid gains on the SDGs by leveraging new
2014 policies, technologies, investments, and behaviours. Approaches focus on reducing
2015 complexity prioritizing interventions, and giving practical guidance.

2016 As efforts to achieve the SDGs intensify in the time remaining to 2030, policy makers and all
2017 actors need practical guidance on what can be done to accelerate progress. However,
2018 providing evidence on what works for achieving each of the 17 SDGs in every country's
2019 context is not possible in this report. There are many potential interventions and levers that
2020 can deliver positive gains, however each country has its own priorities and circumstances
2021 and context is important.

2022 One source of knowledge on important shifts and interventions that could accelerate
2023 progress lies in the many scenario projections undertaken at various scales. This chapter
2024 first shows what global scenario projections reveal about accelerating progress towards the
2025 SDGs and possible outcomes by 2030. The framework of entry points and levers from the
2026 2019 Global Sustainable Development Report are then re-examined in light of these
2027 scenarios as spaces for integrated and transformative action. Finally, decisive shifts and
2028 ambitious interventions are outlined for each entry point that could be deployed by
2029 governments and other actors to accelerate progress on the SDGs.

2030 While this yields important insights on 'what' can be practically done to achieve the SDGs,
2031 the solutions also face a range of impediments which undermine their feasibility and
2032 efficacy. These impediments will need to be overcome to accelerate progress in the
2033 remaining years to 2030. It is therefore important to underpin these actions with knowledge
2034 on 'how' decisive changes can be enabled, which is the focus of chapter 4.

2035 Global scenario projections for the SDGs

2036 Scenario projections have been used for several decades to explore the implications of
2037 continuing on current trajectories or shifting to alternative plausible futures. The growing
2038 research interest in the SDGs in recent years is also reflected in global scenario modelling
2039 studies. These address critical questions facing decision-makers: where is the world
2040 currently heading, and what are the consequences of not achieving the SDGs? What
2041 pathways and interventions can shift the outcomes in 2030 or in 2050 even?

2042 Chapter 1 indicated that the world is not on-track to achieve the Goals. Those forecasts are
2043 based on a continuation of recent trends, but provide little guidance on what can be done to
2044 accelerate progress. Scenario projections on the other hand provide coherent 'plausible

futures' conditional on certain assumptions or on the implementation of certain policies and measures.

To date, most global scenario projections have not been carried out specifically for the SDGs but rather for climate change.³⁰² The best-known global scenarios are the five 'socio-economic pathways' (SSPs) based on different narratives and assumptions about how the future will unfold (Box3-1).³⁰³ This includes a 'sustainability' pathway (SSP1) which is generally most aligned with the SDGs, and a 'middle-of-the-road' pathway (SSP2) which is used to represent the current trajectory. Each of these pathways is supported by global projections provided by a range of integrated assessment models (IAMs)³⁰⁴ but they have only limited coverage of SDG targets for 11 of the 17 Goals.³⁰⁵

Box 3-1: Scenario frameworks for global change

Scenarios have been a key component of global change research for several decades and are used to explore how the future may evolve under different conditions and how to achieve more desirable outcomes.³⁰⁶

The shared socioeconomic pathways (SSPs) and representative concentration pathway (RCP) framework combines alternative socioeconomic developments and atmospheric concentrations and associated climate change outcomes. The five SSPs include different assumptions for societal factors such as demographics, human development, economic growth, inequality, governance, technological change and policy orientations. They are designed to span a range of outcomes for two key characteristics: the challenges that the underlying factors present to adapting to climate change, and the challenges they present to mitigating climate change. These factors are described in the pathway narratives developed for each SSP.

SSP1 - Sustainability – The world shifts gradually, but pervasively, toward a more sustainable path, emphasising more inclusive development that respects perceived environmental boundaries. Management of the global commons slowly improves, educational and health investments accelerate a demographic transition, and a shift from economic growth toward a broader emphasis on human wellbeing. Driven by an increasing commitment to achieving development Goals, inequality is reduced both across and within countries. Consumption is oriented toward low material growth and lower intensity use of resources and energy.

SSP2 - Middle of the Road – A business-as-usual scenario. The world follows a path in which social, economic, and technological trends do not shift markedly from historical patterns.

SSP3 - Regional Rivalry – A resurgent nationalism, concerns about competitiveness and security, and regional conflicts push countries to increasingly focus on domestic or, at most, regional issues.

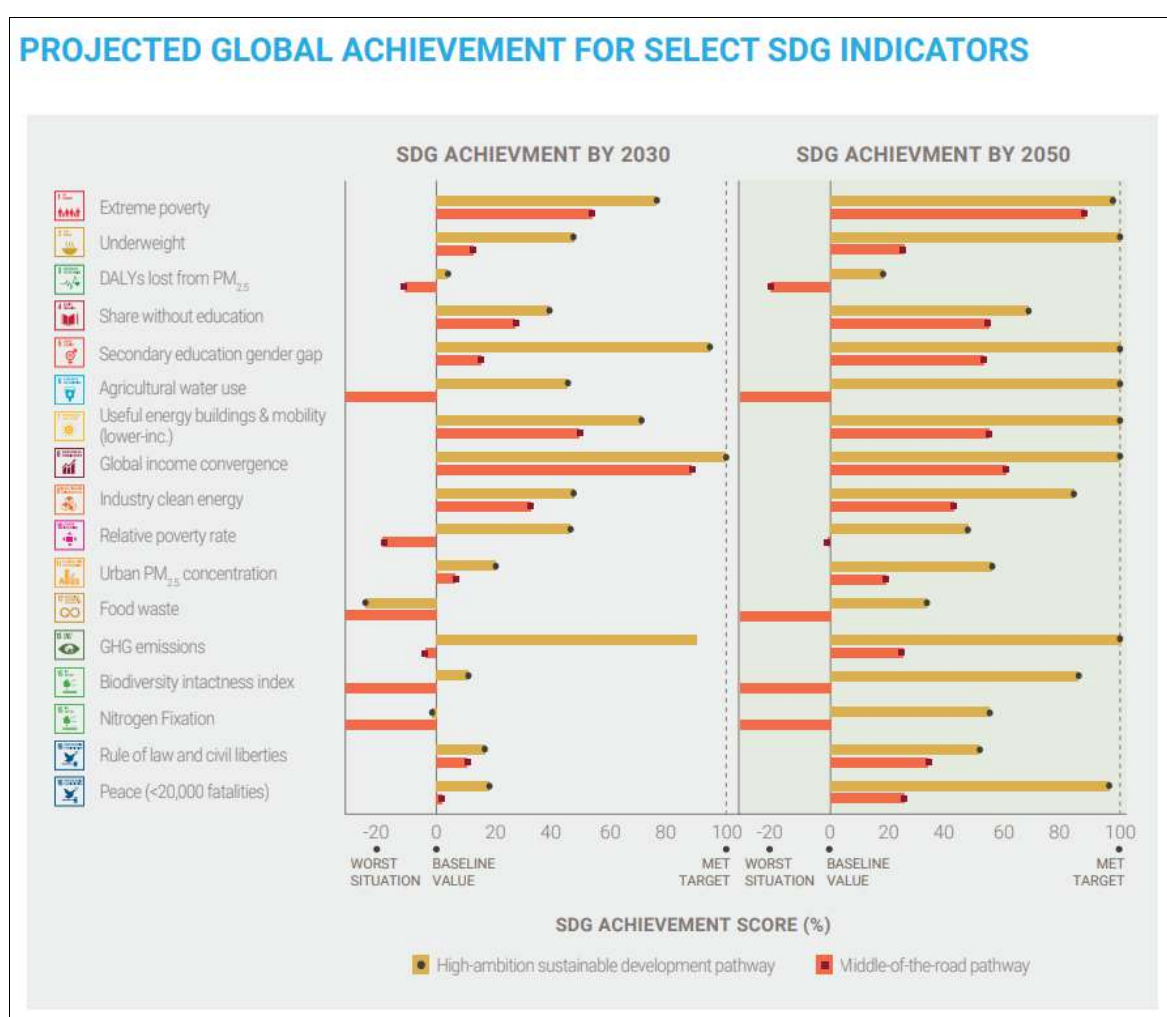
SSP4 - Inequality – Highly unequal investments in human capital, combined with increasing disparities in economic opportunity and political power, lead to increasing inequalities and stratification both across and within countries.

SSP5 - Fossil-fuelled Development – This world places increasing faith in competitive markets, innovation and participatory societies to produce rapid technological progress and development of human capital as the path to sustainable development.

The projections indicate that, even under the more optimistic sustainability-oriented scenario (SSP1), none of the SDG targets in the scenarios would be achieved by 2030, or even 2050. There would be some progress in extreme poverty and hunger, as well as in access to water, sanitation and electricity, but performance would regress on targets relating to greenhouse gas emissions and air pollution. While this paints a pessimistic picture, the SSPs were not designed to represent ambitious pathways.³⁰⁷ What can be concluded from these projections is that in the lead up to 2030, transformative policies will be critical to accelerate progress towards the SDGs and global climate targets.

A recent global study considers four scenarios including a ‘middle-of-the-road pathway’ (SSP2) which incorporates nationally determined contributions (NDCs) on climate change as well as a new ‘Sustainable Development Pathway’(SDP) (figure 3-1).³⁰⁸ The projections from this study indicate that on the middle of the road pathway, the SDGs will not be achieved. Gains are made in key areas including extreme poverty reduction and global income convergence. But progress is minimal on targets relating to malnutrition, gender gaps in education, and governance, and the world would regress in air pollution and associated health impacts, agricultural water use, relative poverty rates, food waste, greenhouse gas emissions, and biodiversity and nitrogen use.³⁰⁹ Continuing with business-as-usual or tepid changes will not begin to match the ambitious aspirations of the 2030 Agenda.

Figure 3-1: SDG progress -The middle of the road versus the high-ambition sustainable development pathway



Note: A value of zero represents the baseline value of the indicator in 2015, while 100 per cent means the target is fully met. Left panel provides results for 2030 and right panel for 2050. Negative values represent a worsening of the situation. The main scenarios, middle-of-the-road (SSP2-NDC) and the ambitious (SDP-1.5C), are shown as bars. Intermediate scenarios, SSP1-NDC and SSP1-1.5C, are indicated by symbols.

Source: Sörge et al., 2021

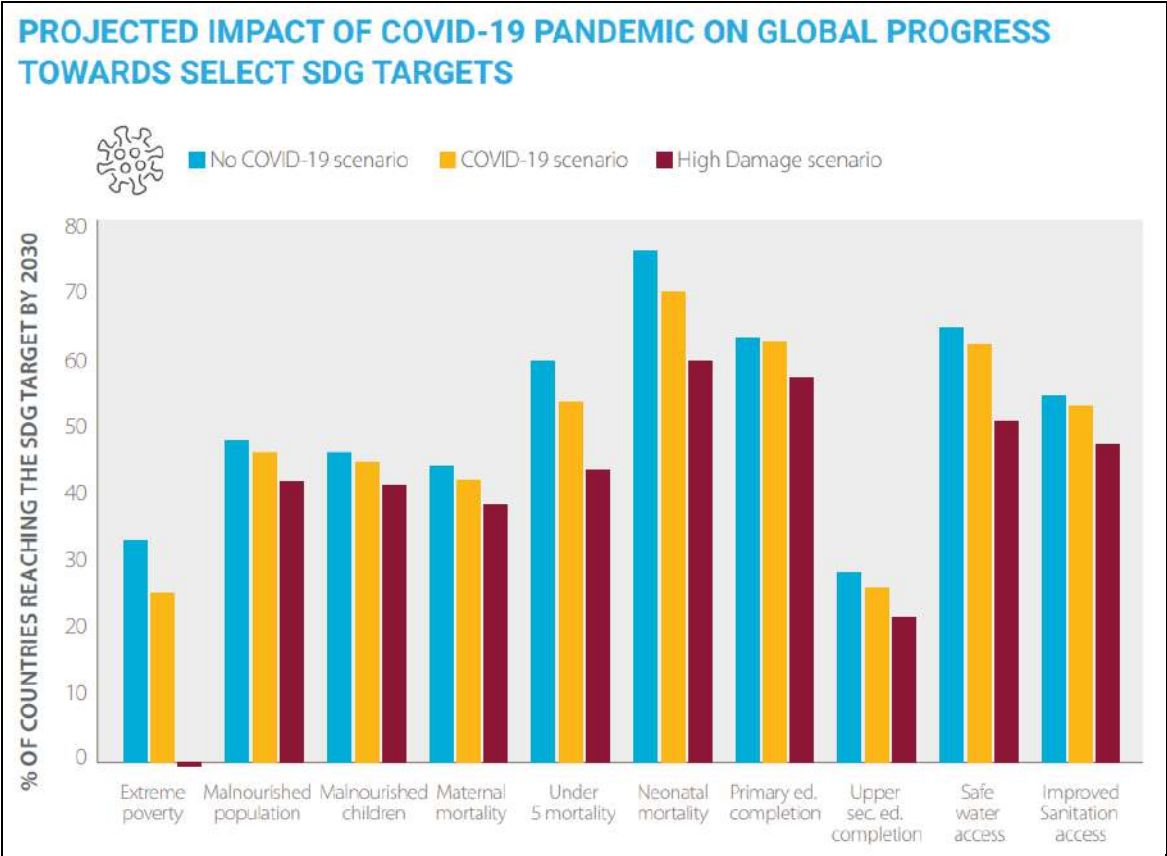
In comparison, the more ambitious Sustainable Development Pathway that is compatible with global warming of 1.5° C highlights that strong gains can be made through additional interventions (labelled SDP-1.5°C). This pathway assumes continued population and GDP growth as well as ambitious climate policies compatible with the 1.5°C target including a

2114 price on carbon, phasing out coal and biomass, mandating electric vehicles, and adjusting
2115 energy subsidies. Other measures include using international carbon revenues and climate
2116 finance to support poverty alleviation, policies on sustainable energy- and land-use-systems
2117 and a more determined shift towards sustainable consumption and diets.³¹⁰ Under this
2118 scenario, progress accelerates with solid gains across most of the Goals by 2030. The long-
2119 term projections for 2050 show that progress continues to advance and stabilise, with most
2120 Goals achieved or nearing their target levels. Nevertheless, some Goals continue to lag,
2121 including on air pollution and management of food waste. The projections also do not
2122 include the impacts of the COVID-19 pandemic.

2123 Studies that do take the pandemic into account focus primarily on the SDG targets related
2124 to human development (figure 3-2).³¹¹ One study finds that even before the pandemic the
2125 world was off-track for many of the targets for poverty, nutrition, health, education, and
2126 water and sanitation, and that 76 countries would have failed to eliminate poverty by
2127 2030.³¹² The impact of COVID-19 is then assessed on the basis of moderate and high-
2128 damage scenarios. Without additional action, in the moderate COVID-19 scenario 48 million
2129 more people would be in poverty in 2030 and in the high-damage scenario that number
2130 would rise to 213 million (figure 3-3).

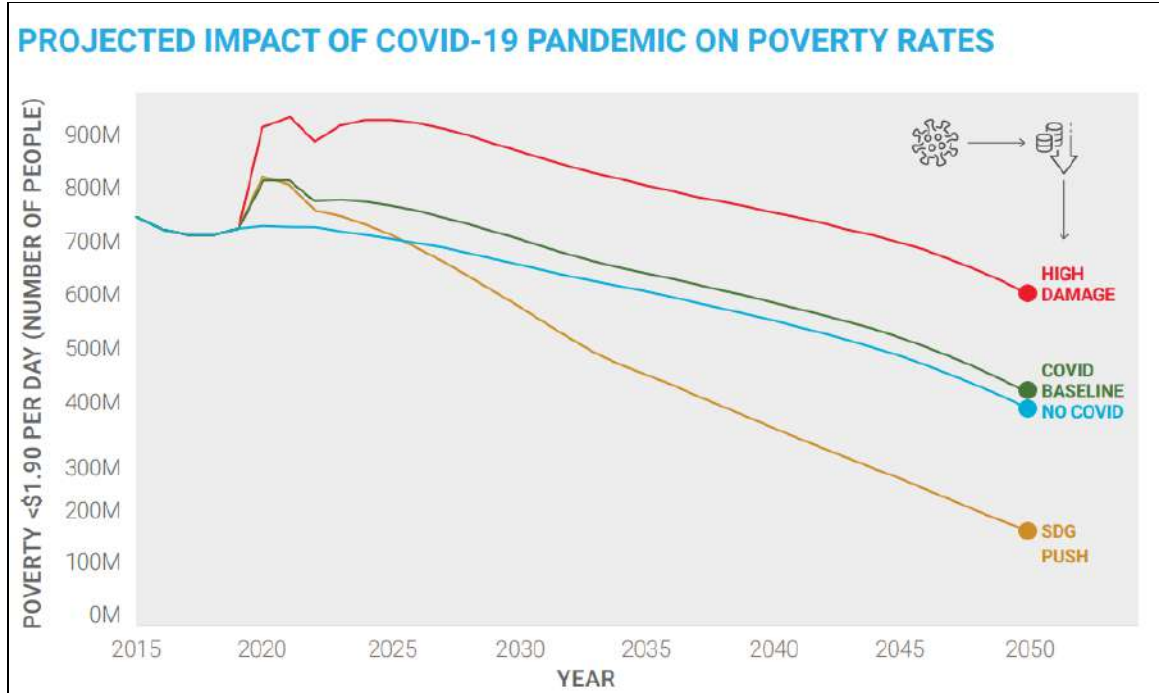
2131 A more optimistic picture emerges from an ‘SDG-push’ scenario – with ambitious worldwide
2132 improvements on social protection, strengthening governance, promoting a green economy,
2133 and addressing digital disruption, with improvements in secondary education and science.
2134 Specific interventions considered include doubling of public health budgets; a 50 to 100 per
2135 cent increase in social welfare transfers; a 30 per cent improvement in governance
2136 measures including participation, effectiveness and control of corruption; and a doubling of
2137 budgetary allocations for education, research and development, and infrastructure. By
2138 2030, this would lift 124 million additional people out of poverty (figure 3-3), with 113
2139 million fewer people malnourished. It would also generate gains across other SDGs in
2140 health, nutrition and education (figure 3-4).

2141 **Figure 3-2: Projected impact of COVID-19 on global progress towards SDG targets**



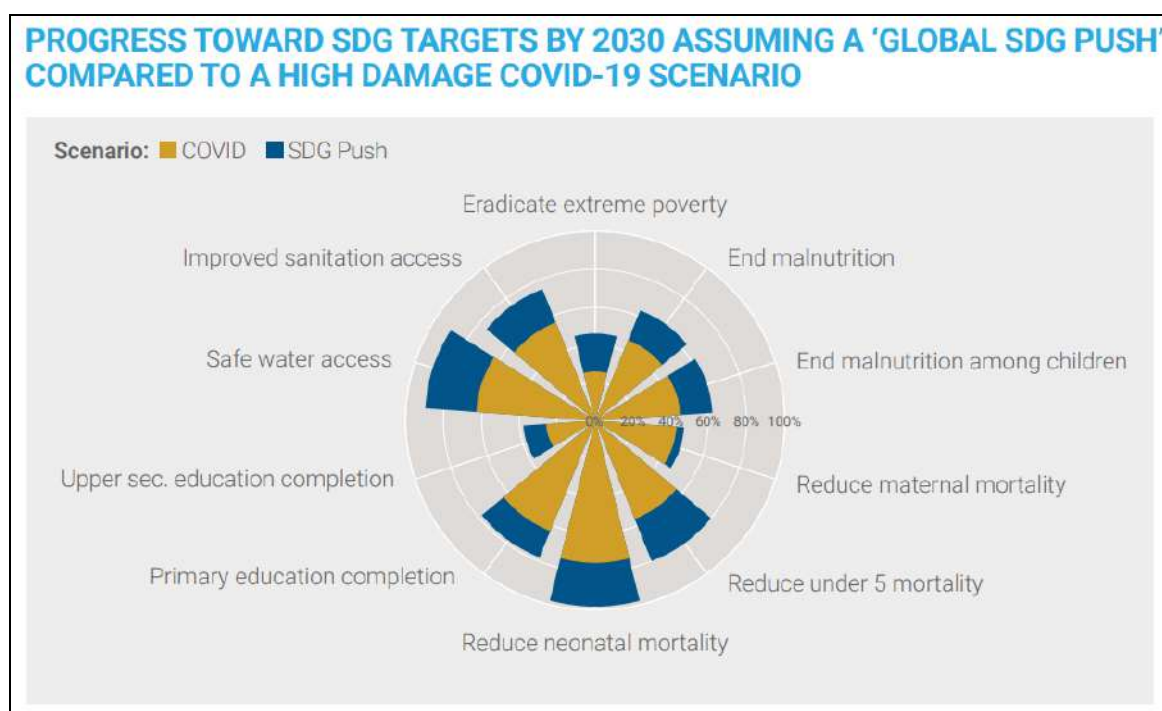
2142 Note: zero represents the baseline value of the indicator in 2015, while 100 per cent means the target is fully met. This chart projects the
2143 situation with and without COVID-19 and also a High Damage' scenario if the economic impacts of COVID are more severe than expected.
2144 Source: Hughes et al., 2021
2145
2146

2147 **Figure 3-3: Impact of COVID-19 on projections for people in poverty**



2148 Source: Hughes et al., 2021
2149

Figure 3-4: Progress toward SDG targets by 2030 assuming a ‘global SDG push’ compared to a high damage COVID-19 scenario



Note: This chart shows the global population's percentage progress toward the target value between 2015 and 2030 (the portion closed of the gap-to-target that existed in 2015). It compares and outcome with heavy COVID-19 damage (red), and one with a global push (turquoise).

Source: Hughes et al., 2021

The message from these global scenario projections is clear. Business-as-usual actions will deliver limited gains on the SDGs. However, with increased ambition, transformative policies can accelerate progress. The sets of assumptions and policies included in more ambitious sustainable development scenarios provide guidance for decision makers on important shifts and priority interventions. Changes in societal goals, policies, incentives, institutions, technologies, and practices are included. Given the diversity of the Goals and targets, it is critical that an integrated and coherent approach is taken to implementation to ensure that interventions target priority entry points for systems change and that trade-offs are managed, and synergies are harnessed.

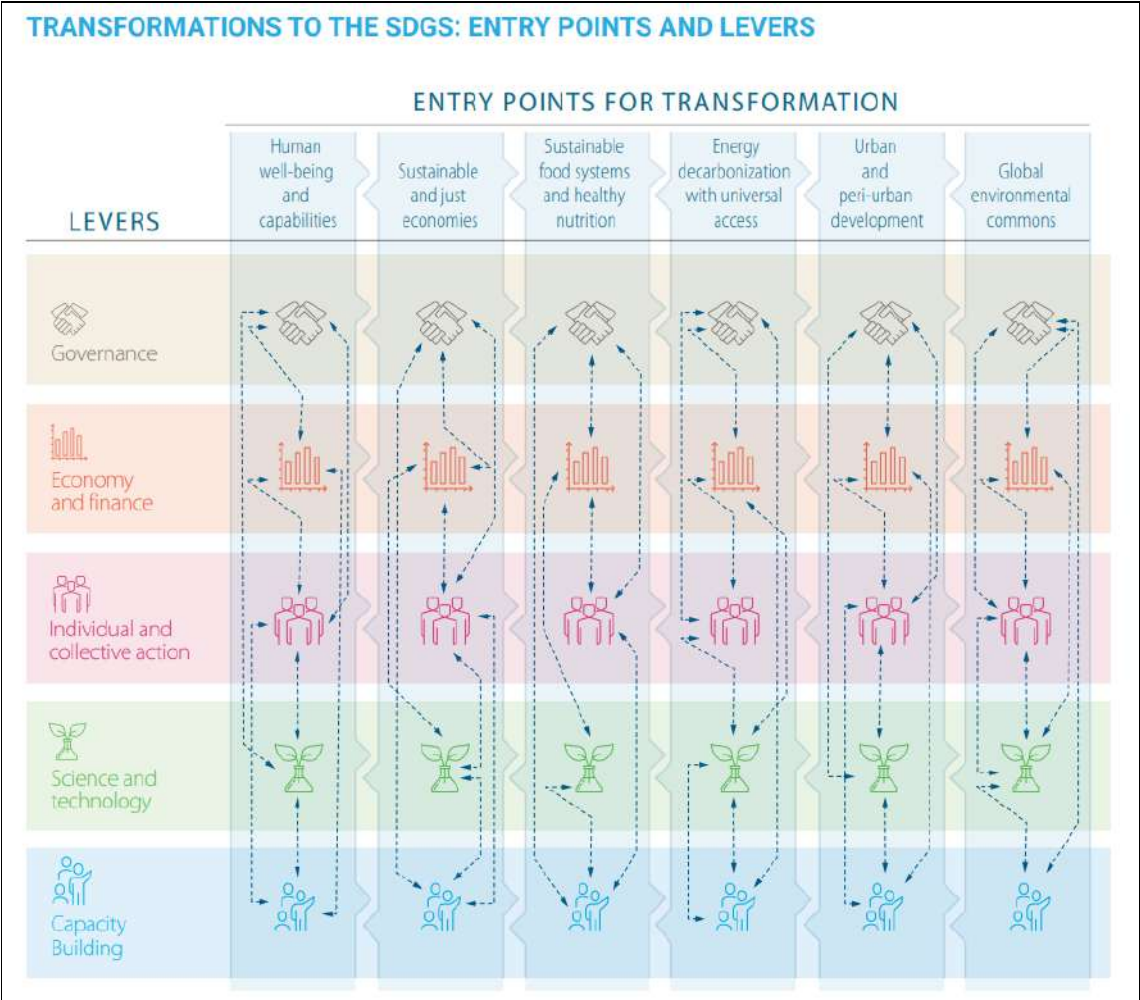
The 2019 *Global Sustainable Development Report* put forward an organizing framework for the transformations needed to achieve the SDGs. It proposed six ‘entry points’ – closely related systems with opportunities to take advantage of synergies among many SDG targets and resolve or ameliorate trade-offs with others (figure 3-5).³¹³ The entry points are:

1. *Human wellbeing and capabilities* – Material well-being and livelihoods, health, security, education, voice and empowerment, and access to a clean and safe environment are all part of human wellbeing. When people's basic needs are met, they develop the capabilities to drive global social, economic and environmental progress and transformations.
2. *Sustainable and just economies* – Economic development and activity are valuable because they can contribute to human wellbeing, not as ends in themselves. The current economic status quo is defined by severe inequality and environmental

- 2178 destruction, and to move toward an economic system that is sustainable and just,
2179 major changes in the way people live, work, produce and consume will be needed.
- 2180 3. *Sustainable food systems and healthy nutrition* – The current food system is a
2181 complex combination of local, national, regional and global unsustainable
2182 agricultural, processing, trade and transport, and retail systems, with obvious links to
2183 health and equity issues around the world. Moving to sustainable food systems will
2184 require deep shifts in production, distribution, retailing, consumption, diets, dealing
2185 with food waste and losses including re-use.
- 2186 4. *Energy decarbonization and universal access* – The 2030 Agenda commits to both
2187 universal access to energy and decarbonization of energy sources across the globe.
2188 Addressing the climate crisis will mean moving away from fossil fuels and ending the
2189 use of polluting solid fuels for cooking - critical to avoiding the current 3.8 million
2190 annual deaths from indoor air pollution.
- 2191 5. *Urban and peri-urban development* – Half of the world’s population now lives in
2192 cities, and urbanization is projected to grow. Equity, health, social wellbeing and
2193 cohesion, and environmental sustainability have to be prioritized in urban and peri-
2194 urban areas. It will also be important to revitalize rural areas.
- 2195 6. *Global environmental commons* – Achieving the entire 2030 Agenda will depend on
2196 protecting shared resources – atmosphere, hydrosphere, global oceans, cryosphere,
2197 polar regions, forests, land, freshwater, and biodiversity.

2198 To produce widespread transformative effects in these entry points, the 2019 Report also
2199 suggested four ‘levers’ of transformation - governance, economy and finance, science and
2200 technology, and individual and collective action, to which this 2023 report adds a fifth lever
2201 ‘capacity building’ which is of value in itself while also supporting the other levers. ^{314, 315, 316}
2202 The development and or mobilization of capacity is essential for the transformation process.

2203 **Figure 3-5: Entry points and levers for transformation**



Source: Independent Group of Scientists, 2019.

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Governance – Governance provides the institutions and the spaces for establishing an overall direction of development, setting targets, coordinating actions, providing regulations, creating specialised organisations, and enabling the flow of finance at national and sub-national levels. Parliaments and state audit offices should ensure accountability for reporting on progress and learning from failures. Formal government institutions also need to work closely with the private sector, and civil society, providing ‘safe arenas’ for deliberation on policies and instruments of transformation. Good governance enhances synergies and identifies trade-offs and connections while building engagement between politicians, civil society, businesses, youth, labour, media, indigenous peoples and local communities.^{317, 318, 319}

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Economy and Finance – Transformations will require significant public and private investment. Global estimates of additional annual investment needed to achieve the SDGs range from \$1.4 trillion to \$2.5 trillion.^{320, 321, 322} In low-income countries, annual outlays related to education, health and infrastructure would have to increase by 14 to 15 percentage points of GDP.^{323, 324} Achieving these levels would require an increased global tax base and, specifically for low-income countries, new forms of international support, including debt relief and financial intermediation.³²⁵ At the same time, financial capital will

2224 need to be redirected to more sustainable technologies, industries and practices.^{326, 327, 328}
2225 Releasing the large sums needed may mean reforming the financial system to discourage
2226 short-term speculative investments and stimulate long-term investment in the real
2227 economy³²⁹.

2228 *Science and technology* – Advancing the SDGs requires social and technological innovation,
2229 and feasible, cost-effective and scalable technologies.^{330, 331} This will mean investing in R&D
2230 and shifting subsidies and incentives towards new sustainable technologies and practices.
2231 When technologies reach a tipping point in cost and market conditions, investors can then
2232 scale finance throughout the transition.³³² The least developed countries need better
2233 access to mature technologies as well as research and development cooperation on
2234 technology development that meets their own needs. Beyond technologies more
2235 investment in international cooperation is needed for research and development that
2236 covers social, economic, environmental, cultural and political aspects of transformation.
2237 Scientific research can help public understanding of complex and emerging sustainable
2238 development, working with governments and others to devise evidence-based solutions.

2239 *Individual and collective action* – Large-scale societal change is often achieved first in
2240 people's hearts and minds, through social organisation and mobilisation at the grassroots
2241 level, and only afterwards enshrined in legislation and economic policies.³³³ Major
2242 paradigm shifts take time.^{334, 335, 336} But if a critical mass of people adopts an innovation,
2243 practice, norm or behaviour, along with collective action by social movements and
2244 coalitions, this can be enough to draw in the rest of the population.³³⁷ Behaviour change can
2245 be supported by education, information strategies and campaigns, financial incentives,
2246 regulatory processes and legislation.³³⁸

2247 *Capacity building* – The capacity needed to support the transformation process to achieve
2248 the SDGs is highly variegated: different SDGs require different transformations, which
2249 themselves might require different kinds of capacity; different stages of transformation
2250 require different kinds of capacity; and capacity needs vary greatly among countries. The
2251 capacities needed for enabling and navigating transitions are required principally in five
2252 areas:

- 2253 ● *Strategic direction and foresight* – Making decisions in a complex and integrated
2254 world requires the capacity to develop visions for long-term sustainable
2255 development and to engage actors to create ownership over shared goals; to
2256 strengthen the science-policy interface and processes for producing, validating
2257 and disseminating robust knowledge for the SDGs; to better understand and
2258 respond to new opportunities; and define strategies and steer action in line with
2259 shared goals.
- 2260 ● *Innovation and generation of new alternatives*– This requires the capacity to
2261 innovate, generate, and select suitable and sustainable alternatives; to scale and
2262 replicate these solutions over time; and to provide protected and informal
2263 spaces to nurture innovation.
- 2264 ● *Orchestration, engagement and negotiation* - Working across siloes and with all
2265 stakeholders is based on the capacity to coordinate action across various actors,
2266 sectors and scales; take a systems approach to synergies and trade-offs; to foster
2267 political willingness and public awareness for change, including disruption of

2268 unsustainable trajectories; and to recognize and manage conflicts and create safe
 2269 spaces for effective engagement with all citizen and marginalized groups.

- 2270 ● *Identifying and overcoming impediments* – Shifting away from business-as-usual
 2271 approaches demands the capacity to recognize unsustainable trajectories,
 2272 diagnose system lock-ins, and undesired effects, and foster political willingness
 2273 and public awareness for change.
- 2274 ● *Learning and resilience* – Generating knowledge about system dynamics and
 2275 feedback will help governments and other stakeholders build more effective and
 2276 resilient strategies. This involves strengthening institutions and networks through
 2277 decentralization, increasing diversity and redundancy, and monitoring and
 2278 continuous learning.

2279

2280 The framework of entry points and levers provides a systematic organising framework for
 2281 action on the SDGs. Using the framework, countries can embark on the priority systems
 2282 transformations needed to achieve greater progress on the SDGs, as seen in the cases of
 2283 Curacao and Germany, for example (Box 3-2). All levers will need to be deployed coherently
 2284 to enable and accelerate transformations across each of the six entry points, resulting in a
 2285 diverse mix of interventions. While knowledge on important shifts and interventions is
 2286 advancing, greater synthesis and consolidation of what works in different contexts is needed
 2287 in formats readily available to decision makers. The role of science in supporting this
 2288 endeavour is discussed further in Chapter 5. It is also critical to complement this evidence
 2289 with an understanding of common impediments that prevent progress and how
 2290 governments and other actors can overcome these.

Box 3-2. Applying the entry points and levers framework in Curacao and Germany

The entry points and levers presented in the 2019 Global Sustainable Development Report have been a basis for organizing reviews of SDG progress and informing institutional arrangements and policy.

Curacao used the six entry points as an organizing framework to review and report on progress on the SDGs in their 2022 Voluntary National Review (VNR).³³⁹ This approach was taken to make the complex information about the SDGs more accessible to different stakeholders. The VNR includes an assessment of how the locally determined SDG Roadmap with accelerators and drivers are linked to the entry points. It also considers successes in SDG progress through each entry point as well as remaining challenges. The involvement of diverse stakeholder groups through dialogues and networks for the six entry points are a key feature and show promise for applying leavers in a cohesive manner that allows for managing trade-offs and building synergies.

Germany has used the entry points and levers to guide policy. Germany's sustainable development strategy is now guided by six "transformative areas": human well-being, capabilities and social justice; energy transition and climate protection; circular economy; sustainable building and mobility transition; sustainable agricultural and food systems; pollutant-free environment. These areas aim at providing a more integrated view on the SDGs for policies and also look at synergies and conflicts between goals and targets.

In 2022, six fixed interdepartmental and interagency project teams ("transformation teams") were established around these areas plus one team focusing on international cooperation. The teams organise the meetings of the State Secretaries' Committee on sustainable development on the respective topics including the preparation of draft resolutions or reports (with concrete goals and measures), and inform implementation measures. The German Sustainable Development Strategy 2021 also highlighted the following five levers: Governance; Social Mobilization and Participation; Finance; Research, Innovation and Digitalization; and International Responsibility and Cooperation.

2291 **Key shifts and interventions to accelerate transformations**

2292 Global scenario studies point to actions for stronger gains on the SDGs by 2030. Many of
2293 these actions are general at the level of scaling up investment in primary healthcare and
2294 social welfare in low-income countries, dietary change, or whole-of-economy carbon
2295 pricing. Implementation will require more specific interventions by countries utilising a
2296 combination of levers. Capacity building to effectively deploy these levers is also important
2297 but is not generally modelled in global scenario projections. However, the studies highlight
2298 that capacity gaps remain an important impediment to achieving the SDGs, and capacity
2299 building for transformation is addressed further in Chapter 4.

2300 Aligning evidence from scenarios with the entry-points and levers can inform integrated and
2301 transformative action. Some of the key shifts that show promise for SDG acceleration from
2302 the scenarios in line with each entry point are outlined here:

2303 *Entry-point 1 – Human wellbeing and capabilities* – Global scenario projections suggest that
2304 current rates of improvement will not achieve the SDGs for health, education or water and
2305 sanitation by 2030, particularly in Sub-Saharan Africa and South Asia.³⁴⁰³⁴¹ But
2306 transformative policymaking, scaled-up investment, and the deployment of existing
2307 technologies could deliver rapid gains if common impediments can be overcome (Figure 3-
2308 6).

- 2309 ● *Health* – Priority shifts towards the goal of healthier societies include establishing
2310 universal health coverage (UHC) and ramping up investment in primary healthcare in
2311 lower and middle-income countries (LMICs) on a core set of interventions for
2312 preventative and outpatient care³⁴², ensuring that every pregnant woman has access
2313 to lifesaving interventions³⁴³, and optimising health systems and scaling up
2314 community-based initiatives.³⁴⁴ Additional investment requirements for primary
2315 health care are estimated at \$200 billion per year in LMICs through 2030,
2316 predominantly in Sub-Saharan Africa and South Asia.³⁴⁵
- 2317 ● *Education* – Priority shifts include accelerating secondary enrolment and completion,
2318 ensuring all girls and boys are enrolled in secondary education so that global mean
2319 years of schooling increases³⁴⁶. Expanding access to tertiary education and increasing
2320 girls' participation in science, technology, and mathematical subjects.
- 2321 ● *Water and sanitation* – Key interventions include universal piped water access and
2322 wastewater collection and the capacity to treat at least half of all return flows by
2323 2030.³⁴⁷ This would require incremental investments reaching \$260 billion per year
2324 by 2030, largely in Africa and Asia.³⁴⁸ Behaviour change to increase end-use
2325 efficiency provides an opportunity to reduce these additional investment
2326 requirements.³⁴⁹³⁵⁰³⁵¹

2327 Together, these shifts could result in accelerated outcomes for the human development
2328 SDGs, including averting 60.1 million deaths³⁵², saving the lives of 5 million neonates³⁵³,
2329 increasing average life expectancy by 3.7 years³⁵⁴, and achieving universal access to water
2330 and sanitation³⁵⁵.

Figure 3-6: Human wellbeing and capabilities: key shifts, interventions and impediments from the global scenario literature



Sources: (Parkinson, Krey et al. 2019, Stenberg, Hanssen et al. 2019, Friedman, York et al. 2020, Paulson, Kamath et al. 2021, Allen, C. et al (2023 forthcoming))

Entry-Point 2 – Sustainable and just economies – Projected pathways that accelerate progress towards poverty targets generally rely on a combination of slower population growth, steady economic growth, and progressive redistribution, particularly in low-income countries.³⁵⁶ Transformative policy and revenue reforms will also play a crucial role (Figure

2341 3-7). For example, in the form of a universal cash transfer system with equal per capita
2342 payments, or more progressive distribution towards lower-income households.³⁵⁷ If
2343 countries are able to achieve more equitable growth trajectories after the COVID-19
2344 pandemic, the average national Gini Index could fall to or below 30 in developing regions by
2345 2030 and the target of ending extreme poverty (\$1.90/day) could be largely met.³⁵⁸³⁵⁹

2346 Other opportunities for making economic activity more sustainable are encouraging lifestyle
2347 changes away from unsustainable goods and practices,³⁶⁰ and boosting innovation and
2348 research in green technologies, resource efficiency, and circular and sharing economies.³⁶¹
2349 The global rollout of national good practice climate policies could accelerate progress over
2350 the period to 2030 and pave the way for more a more comprehensive global carbon pricing
2351 scheme and see emissions decline in line with a 1.5°C target³⁶².

2352 Financing for progressive national redistribution could come from reformed and more
2353 effective tax-based revenue, and from domestic carbon-pricing revenues, with a portion of
2354 the revenues from developed countries committed to financing global poverty reduction in
2355 lagging countries.³⁶³ The recycling of revenues from global carbon pricing would be more
2356 than adequate for financing poverty reduction when supplemented by international
2357 transfers from developed countries. This would ameliorate potential trade-offs between
2358 climate and poverty targets.³⁶⁴

Figure 3-7. Sustainable and just economies: key shifts, interventions and impediments from the global scenario literature



Sources: (Millward-Hopkins, Gouldson et al. 2017, Moyer and Bohl 2019, Fujimori, Hasegawa et al. 2020a, Liu, Fujimori et al. 2020, Schandi, Lu et al. 2020, Bjelle, Wiebe et al. 2021, Hoy and Sumner 2021, Pereira, Asrar et al. 2021, Soergel, Kriegler et al. 2021a, Soergel, Kriegler et al. 2021b, van Soest, Aleluia Reis et al. 2021, Lakner, Mahler et al. 2022, Moallemi, Eker et al. 2022, Moyer, Verhagen et al. 2022)

2366 *Entry-Point 3— Food systems and healthy nutrition* – Food systems transformation depends
2367 on a mix of supply side measures including making inputs accessible and affordable for all;
2368 increasing yields sustainably where agricultural productivity is low, while reducing inputs of
2369 fertilisers and pesticides; making water use and international trade more efficient; and
2370 reducing negative impacts especially on biodiversity and climate; and more sustainable and
2371 efficient measures in retailing, processing and distribution. Measures on the demand side,
2372 most importantly include shifting towards healthier and more diversified diets (e.g. plant-
2373 based) with food produced in a sustainable manner, and reducing post-harvest losses and
2374 food waste³⁶⁵ (Figure 3-8). Large shifts are required, such as 70 per cent improvement in
2375 fertiliser efficiency,³⁶⁶ 32 per cent increase in yields,³⁶⁷ a doubling of agricultural production
2376 with a 20 per cent increase in cropland,³⁶⁸ global reduction in meat consumption of around
2377 40-50 per cent,³⁶⁹ and a 50 per cent reduction in global food waste by consumers and supply
2378 chains by 2050.³⁷⁰

2379 Greater economic circularity and behavioural change³⁷¹ can accelerate these shifts as well as
2380 a rapid uptake of improved technologies especially in Africa, Asia and Latin America.³⁷² New
2381 R&D investments of around \$4 billion per annum,³⁷³ increased trade liberalization,³⁷⁴ and
2382 public health, education and incentives are needed to influence social norms towards
2383 healthy diets supported by sustainable food systems and better food-waste management.³⁷⁵
2384 Scaling up 18 proven nutrition interventions could accelerate progress on stunting and
2385 wasting³⁷⁶, while agricultural subsidies or food aid could help reduce those at risk of
2386 hunger³⁷⁷. Technological options can reduce land-sector emissions targeting enteric
2387 fermentation and manure management.³⁷⁸

Figure 3-8. Food systems and nutrition patterns: key shifts, interventions and impediments from the global scenario literature



Sources: (Doelman, Stehfest et al. 2019, Eker, Reese et al. 2019, Gil, Daioglou et al. 2019, Moyer and Bohl 2019, Pastor, Palazzo et al. 2019, van Soest, van Vuuren et al. 2019, Gerten, Heck et al. 2020, Leclère, Obersteiner et al. 2020, Moyer and Hedden 2020, Scott, Delport et al. 2020, van Meijl, Tabeau et al. 2020, Wang, Dietrich et al. 2020, Pereira, Asrar et al. 2021, Soergel, Kriegler et al. 2021, van Soest, Aleluia Reis et al. 2021, Zhang, Runting et al. 2021, Doelman, Beier et al. 2022, Moallemi, Eker et al. 2022, Rosegrant, Sulser et al. 2022)

2395 *Entry-Point 4 – Energy decarbonization and universal access* – Accelerating progress requires
2396 the large-scale deployment of renewables and best available technologies, appliances and
2397 equipment,³⁷⁹ rapidly scaling up infrastructure investment and support for universal
2398 electricity access and clean cooking alternatives,³⁸⁰ phasing out of coal generation and
2399 biomass cookstoves by 2030,³⁸¹ major changes in global consumer behaviour to reduce
2400 energy consumption,³⁸² and end-use electrification³⁸³. Policy measures include carbon
2401 pricing, energy efficiency regulations and standards, mandatory renewable energy targets,
2402 forced phase-out measures, and consumer incentives and subsidies, particularly for low-
2403 income households³⁸⁴ (Figure 3-9). Progress could also be accelerated through investment in
2404 renewable and digital technologies,³⁸⁵ divestment from fossil fuels,³⁸⁶ recycling carbon
2405 revenues to support clean energy,³⁸⁷ and scaling up investment in electricity infrastructure
2406 in Africa.³⁸⁸ Annual investment gaps for low-carbon energy and energy efficiency to 2030 in
2407 line with a 1.5 °C pathway are estimated at \$460 billion.³⁸⁹

2408 Figure 3-9. Energy decarbonization and universal access: key shifts, interventions and
2409 impediments from the global scenario literature



2412 Sources: (Millward-Hopkins, Gouldson et al. 2017, Batinge, Kaviti Musango et al. 2019, Campagnolo and Davide 2019, Parkinson, Krey et al.
2413 2019, Dagnachew, Hof et al. 2020a, Dagnachew, Poblete-Cazenave et al. 2020b, Liu, Fujimori et al. 2020, Millward-Hopkins, Steinberger et
2414 al. 2020, Philippidis, Shutes et al. 2020, Pereira, Asrar et al. 2021, Poblete-Cazenave, Pachauri et al. 2021, van Soest, Aleluia Reis et al.
2415 2021, Warszawski, Kriegler et al. 2021, Doelman, Beier et al. 2022, Moallemi, Eker et al. 2022)

2416 *Entry Point 5 – Urban and peri-urban development* – Important shifts include doubling the
2417 recycled and composted share of municipal waste by 2030 and a more circular waste
2418 cycle,³⁹⁰ more use of electric cars,³⁹¹ better public transport³⁹² with cities’ infrastructure
2419 oriented to people and pedestrians and not cars, and good-practice policies for transport,
2420 buildings and waste.³⁹³ These shifts would be enabled by investments in waste collection
2421 systems,³⁹⁴ in public-transport networks and incentives, educational initiatives for waste
2422 and transport behaviour change, incentives for electric vehicles, vehicle efficiency
2423 regulations, and stronger building standards³⁹⁵ (Figure 3-10). It is also important to tackle
2424 the deprivations of slum communities including the lack of adequate and safe housing
2425 conditions, clean water supply, sanitation and secure land tenure. Sustainable transitions in
2426 food and energy systems, human wellbeing and the economy would also have strong
2427 synergies with sustainable urban and peri-urban development.

Figure 3-10. Shifts and interventions from global scenarios for transforming urban and peri-urban development: key shifts, interventions and impediments from the global scenario literature



Sources: (Chen, Bodirsky et al. 2020, Liu, Fujimori et al. 2020, Pereira, Asrar et al. 2021, Soergel, Kriegler et al. 2021a, van Soest, Aleluia Reis et al. 2021)

Entry Point 6 – Global environmental commons – A broad range of shifts across land and water systems include expanding protected areas to 40-50 per cent of terrestrial areas by 2050,³⁹⁶ abandoning intensive agricultural practices in protected areas,³⁹⁷ ambitious reforestation of all degraded forest areas,³⁹⁸ and preserving 85 per cent of tropical/boreal forest and 50 per cent of temperate forest on each continent.³⁹⁹ Others could include shifting societal preferences towards conservation land use,⁴⁰⁰ reducing water consumption and ensuring environmental flow requirements,⁴⁰¹ and adopting a 1.5°C land-sector roadmap to 2050 combining ambitious protection, conservation, restoration and lifestyle changes.⁴⁰² A range of policies could support these shifts, including protected areas and land

regulations, integrated land-use planning and sustainable forest management, securing land tenure, payments for ecosystem restoration and nature-based solutions⁴⁰³ (Figure 3-11). If implemented effectively, by 2050 these ambitious measures can ensure that primary forest is fully conserved, terrestrial biodiversity loss is halted with modest improvements in biodiversity,⁴⁰⁴ and around 3-11 per cent of terrestrial area is restored.⁴⁰⁵ However there are still notable gaps in scenario projections, in particular relating to ocean systems and life below water.

Figure 3-11. Global environmental commons: key shifts, interventions and impediments from the global scenario literature



Sources: (Gil, Daioglou et al. 2019, Moyer and Bohl 2019, Pastor, Palazzo et al. 2019, Roe, Streck et al. 2019, Stehfest, van Zeist et al. 2019, Gerten, Heck et al. 2020, Leclère, Obersteiner et al. 2020, Liu, Fujimori et al. 2020, Pereira, Asrar et al. 2021, Soergel, Kriegler et al. 2021a, Zhang, Runting et al. 2021, Doelman, Beier et al. 2022)

2456 Scenario projections show that significant gains in SDG progress can be made with new
2457 policies, technologies, investments, and behaviours. In some cases, the solutions may seem
2458 obvious, such as the expansion of public health systems, improving social transfer schemes,
2459 legislating carbon pricing instruments, or incentivizing the rapid uptake of sustainable
2460 technologies and practices. Governments clearly have a central role to play in implementing
2461 such measures.

2462 However, the scenario studies also point to a range of impediments that can hamper both
2463 the feasibility and efficacy of these solutions. For example, deficits in governance and
2464 institutional capacities for prioritising policies, mobilizing resources, delivering services, and
2465 coordinating efforts.^{406, 407} Achievement of the SDGs will be severely constrained if
2466 institutional reforms do not occur and violent conflicts continue.⁴⁰⁸ Sunk investments in
2467 existing capital (e.g. food production and distribution systems or fossil-fuel dependent
2468 infrastructure) as well as perceived trade-offs between development objectives (e.g.
2469 decarbonisation, food security and jobs and livelihoods) may create resistance from vested
2470 interests and undermine political feasibility of taking action.^{409,410,411} The substantial upfront
2471 investments associated with large-scale infrastructure and social policy measures are also
2472 hampered by public and private financing gaps, particularly where tax systems and markets
2473 are underdeveloped.⁴¹²⁴¹³ Large-scale changes will have to take place against engrained
2474 behaviours such as those associated with vehicle use, waste burning, or dietary
2475 patterns⁴¹⁴⁴¹⁵⁴¹⁶.

2476 Faced with these impediments, it is critical to build understanding not only on ‘what’ needs
2477 to be done but also on ‘how’ systems change can happen. Transformations typically take
2478 time to unfold and move through different stages of phases which face different
2479 impediments that change what is needed from different actors. Common impediments
2480 experienced at different phases of transformation and solutions to overcome these are the
2481 subject of the next chapter.

2482

Chapter 4: Accelerating transformations to the SDGs

A clear lesson from history is that transformation is inevitable. But change can also be steered in positive directions by human determination. If the governments and communities of the world are to create successful transformations for the SDGs by 2030, they must take bold and unprecedented action. They can do this by strategically enabling promising SDG solutions to move from emergence to acceleration to stabilization – tracing an S-curve. This may appear to be more difficult at a time of multiple and compounding crises, but these crises paired with strategy considering the interlinkages between SDGs can also clear spaces for action that previously would have seemed over-ambitious or extreme. Initiatives must be broad-based and inclusive, driven by a diverse set of actors all across the world. Transformations will fail if they leave people behind.

Over the last 200 years, human societies have steered many rapid and profound transformations – in human rights, the economy, health, technology and living standards.⁴¹⁷ A fundamental achievement in the 19th century was an expansion in many countries of education and social welfare, which accelerated in the 20th Century after World War II with many countries moving toward universal health care and more comprehensive social security systems.⁴¹⁸

In the 1970s, similar achievements spread to many developing countries, which succeeded in improving health and in reducing poverty and hunger, but they rarely achieved universal coverage. An important element of this was the Green Revolution which transformed farming systems, using high-yielding crops along with fertilisers and irrigation.⁴¹⁹ But the Green Revolution also offers a cautionary tale, illustrating both the benefits and the risks of a science-driven transformation. From the 1970s, crop yields rose rapidly, consumption increased, and undernutrition plummeted. At the same time, however, the Green Revolution left many smallholders behind, excluded by inequitable land distribution, poor tenancy rights, and lack of access to credit.⁴²⁰ Women farmers were especially disadvantaged. The intensive, chemical-heavy farming approaches that dominated the Green Revolution also affected soils, water, biodiversity, and nutrition.⁴²¹

The Green Revolution is a reminder of the importance of taking a whole-of society approach that embraces co-benefits and faces up to trade-offs and risks – weighing up positives and negatives to optimize human wellbeing while safeguarding the planet. All the more important in an age of looming environmental catastrophe and high interconnectedness.

Transformations should involve dynamic interactions between science, business and government that amplify and nurture grassroots energy. While the priorities inevitably differ from country to country, there are some principles and useful tools. This chapter contributes to this toolkit with a stylized model that can help policy makers understand the transformation process, and how levers need to work together across different phases to identify game-changing interventions for achieving the 2030 Agenda.

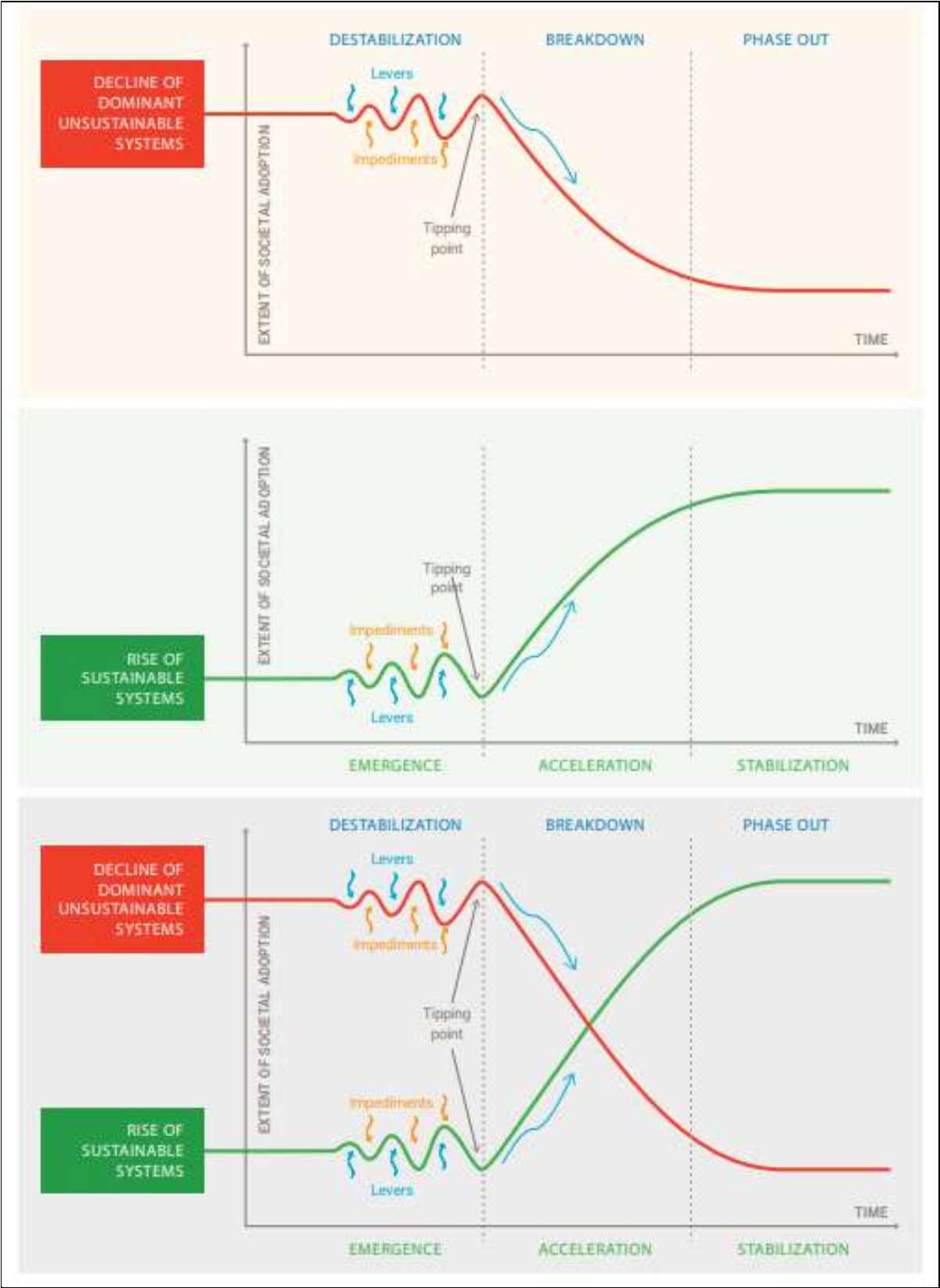
S-curve transformations

A successful transformation can be considered in three phases – emergence, acceleration and stabilisation – that trace an S-curve (figure 4-1).⁴²² The first, emergence phase is when innovative ideas slowly give rise to new technologies and practices that operate in niches

2525 and on the fringe, often through experimentation and learning. During the second,
2526 acceleration phase these innovations gain momentum and reach tipping points beyond
2527 which they are widely shared and adopted, leading to rapid, non-linear growth. Finally, in
2528 the third, stabilisation phase these technologies and practices become embedded in daily
2529 life as the new normal.

2530 S-curves work in both directions. The rise in innovative technologies and practices aligned
2531 with the SDGs would be mirrored by a decline in unsustainable technologies, institutions
2532 and practices. This reverse S-curve has three corresponding phases: destabilisation,
2533 breakdown and phase-out.⁴²³ For example, the rise of renewable energy systems or
2534 electrified transport, is being matched by the decline of fossil-fuel energy and internal
2535 combustion vehicles. Similarly, the rise of sustainable agricultural systems and dietary
2536 practices will be accompanied by a decline in conventional, unsustainable agriculture and
2537 diets. Policy makers can intervene along both of these curves – using different levers to
2538 overcome impediments and support positive options while also destabilising and breaking
2539 down unsustainable configurations.⁴²⁴

2540 **Figure 4.1: Three phases of transformation**

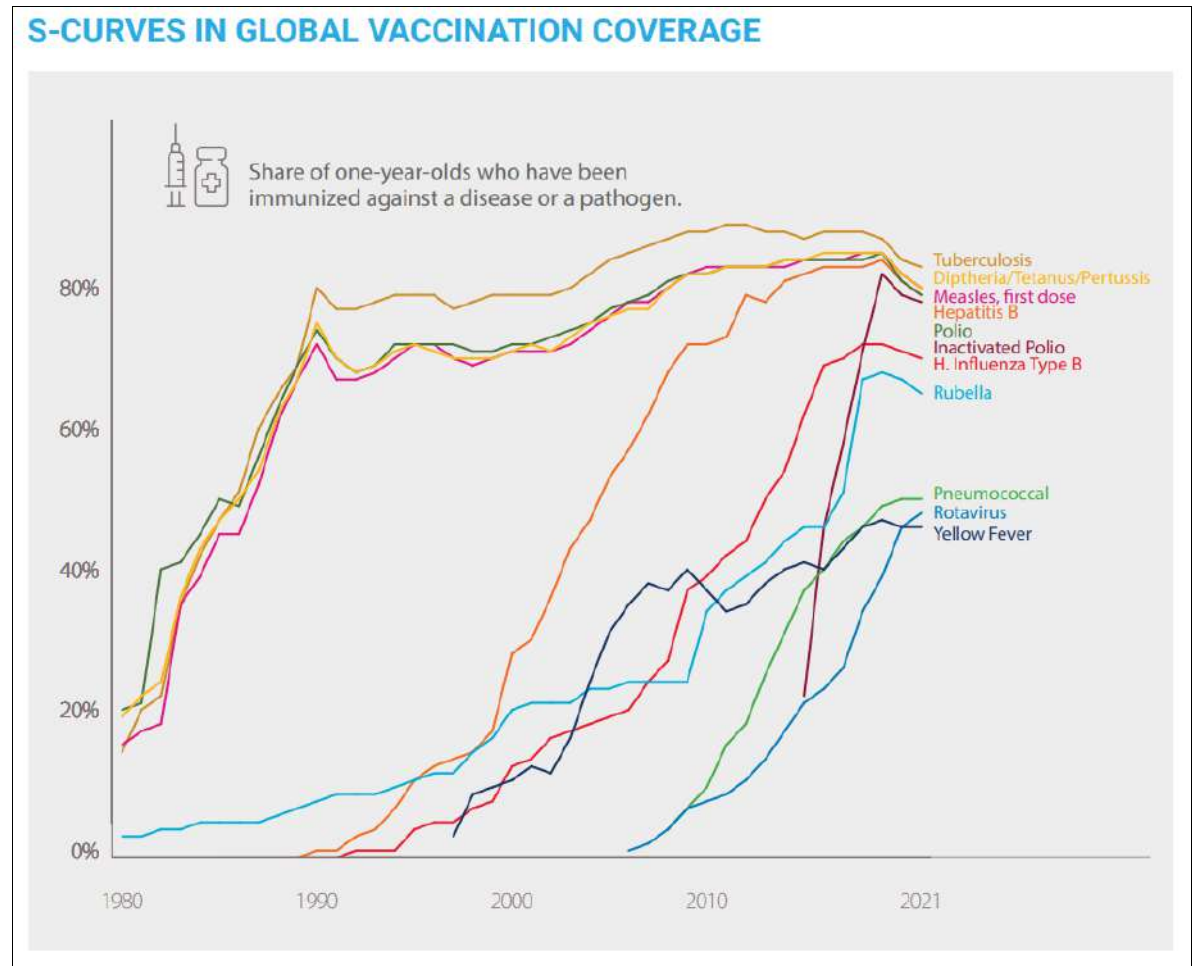


2541

2542 The S-Curve is a familiar pattern in scientific research where it may represent the life of a
2543 system,⁴²⁵ a social-ecological transformation,⁴²⁶ or the diffusion of innovation.⁴²⁷ An

example of a science-based S-curve transformation relevant for the SDGs is global immunisation, which was a key part of the ‘child survival revolution’ from the 1990s, as governments, international organisations and others significantly boosted global vaccination coverage (figure 4-2).

Figure 4-2: S-curves in global vaccination coverage



Source: Samantha Vanderslott, Saloni Dattani, Fiona Spooner and Max Roser (2013) - "Vaccination". Published online at OurWorldInData.org. Retrieved from: 'https://ourworldindata.org/vaccination'

Diffusion of new innovations and practices is important in transformations and can be seen as involving five groups of people.⁴²⁸ First in are the ‘innovators’ who may be motivated by the status and excitement that comes with newer technologies or practices, whatever the price. Next come the ‘early adopters’ who consider the costs and weigh the advantages and disadvantages of the innovations, followed by the ‘early majority’ and ‘late majority’ who are often influenced by social pressure. Last are the ‘laggards’ who are less susceptible to social pressures and who may consider innovations unnecessary and expensive or even competitive with other interests, and only adopt them if there is no other option.⁴²⁹

Along this trajectory, the innovations themselves evolve, typically becoming cheaper and more effective as they are embedded with other complementary institutions, norms, technologies and infrastructure (Box 4-1). Beyond a tipping point, an innovation reaches a critical mass and could become self-sustaining.⁴³⁰ It has been estimated that having 20 to 30

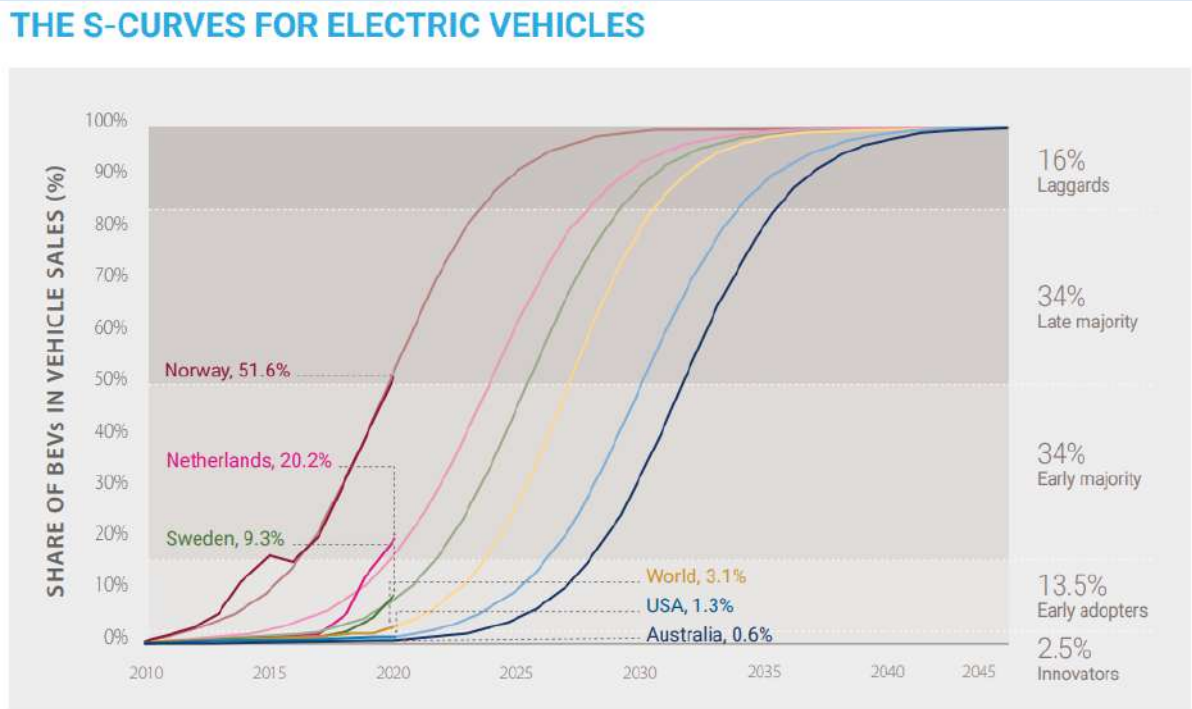
percent of a population engage in an innovative activity can be sufficient to tip the whole society.⁴³¹

Box 4-1: The S-curves for electric vehicles

In 2021, sales of battery electric vehicles reached around 6 per cent of new car sales.⁴³² At the global scale, this places them in the ‘early adopters’ category. However, several countries, such as Norway and the Netherlands advanced rapidly along the S-Curve, moving into acceleration and towards stabilisation. Key factors for potential adopters are the up-front costs and availability of an adequate charging network.⁴³³ Governmental policy and tax incentives also helps acceleration.

However, this transition can also cause damage and trade-offs and spillovers must be accounted for and managed. For example, there are growing concerns about resource availability, labour rights, and non-climate environmental impacts. There are also the costs of critical minerals needed for lithium-ion batteries, though there are considerable opportunities for recycling and for circular and closed-loop systems.⁴³⁴

Share of battery electric vehicles in new passenger vehicles sales and projected S-curves, by 2020⁴³⁵



Nevertheless, innovation can also fail or divert along undesirable pathways (figure 4-3). This can happen, for example, if innovations are not complemented with necessary infrastructure, markets or supportive policies.⁴³⁶ For example, emerging technologies may find it hard to compete with lower cost and high-performance incumbent technologies, requiring policies and incentives to promote their adoption.

Other sources of failure include lock-ins to old technologies and practices, as a result of large sunk investments in existing infrastructure, skills and industries that can create vested interests opposed to change – as with decades of investment in fossil-fuel based infrastructure. Such vested interests may use their access to policy processes to resist or water down policy changes that could accelerate the uptake of new innovations.⁴³⁷ Or there can be backlashes as people protest against lost livelihoods or perceived loss of status when

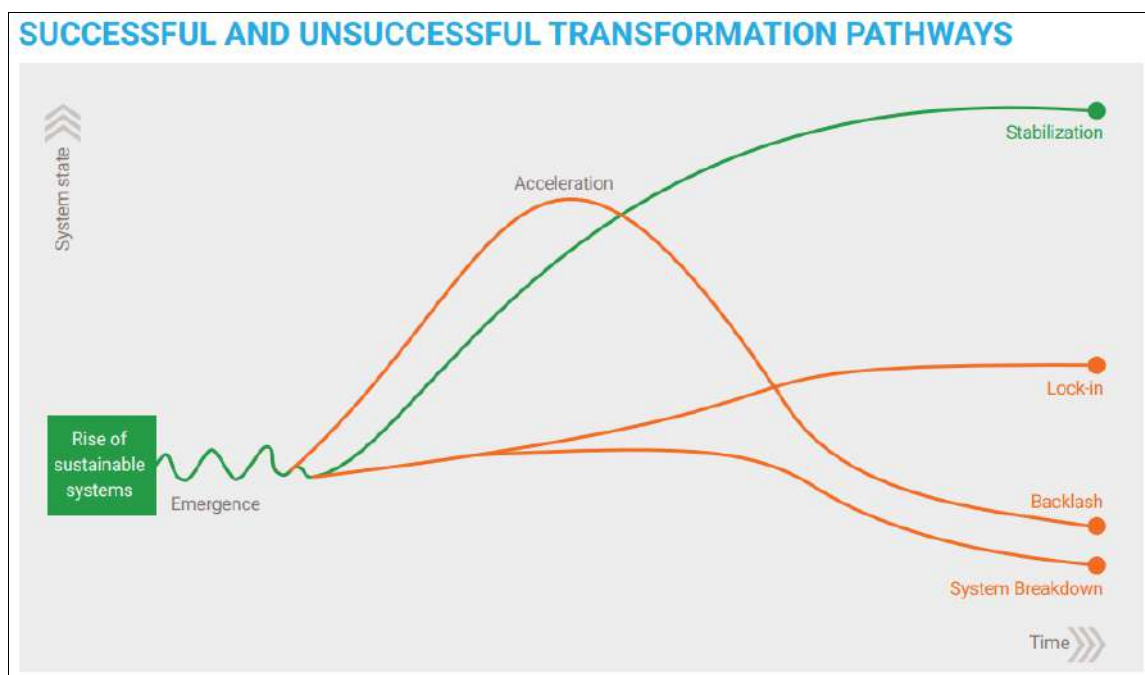
automation displaces them from their jobs. Or there can be system breakdowns, as a result of continuing conflict fuelled by strong coalitions of vested interests or political corruption. In countries with ongoing conflicts, it can be too dangerous even to send children to school.

Other impediments that undermine transitions include critical gaps in human, financial and institutional capacities and threats against peace and security;⁴³⁸ existing regulations, standards, and incentives that favour incumbent firms and interests and create an uneven playing field for emerging sustainable alternatives;⁴³⁹ unanticipated or unmanaged trade-offs and spillover effects from other actions; as well as behaviours and entrenched social norms where lifestyles become organised around particular technologies, practices and behaviours and are difficult to change.⁴⁴⁰

For example, particularly for innovations that benefit women, existing social norms and behaviours can create barriers to innovation. According to the Gender Social Norms Index, 91 per cent of men and 88 per cent of women show at least one clear bias against gender equality in areas such as politics, economics, education, intimate partner violence and women's reproductive rights. Men show higher biases across all dimensions.⁴⁴¹

Countries can also remain locked into older systems if governments settle for 'low hanging fruit' or only adopt piecemeal solutions. They may, for example, adopt natural gas as a transition fuel but go no further towards renewable energy. This may improve system performance for a while but will not support the related SDGs or climate objectives. 'Small wins' can buy time and build up capabilities and momentum, but if they fail to address fundamental problems they can delay decisive transformations and lead ultimately to system breakdown.

Figure 4-3: Successful and unsuccessful transformation pathways⁴⁴²



Source: Loorbach *et al.*, 2017.

2615 *SDG curves*

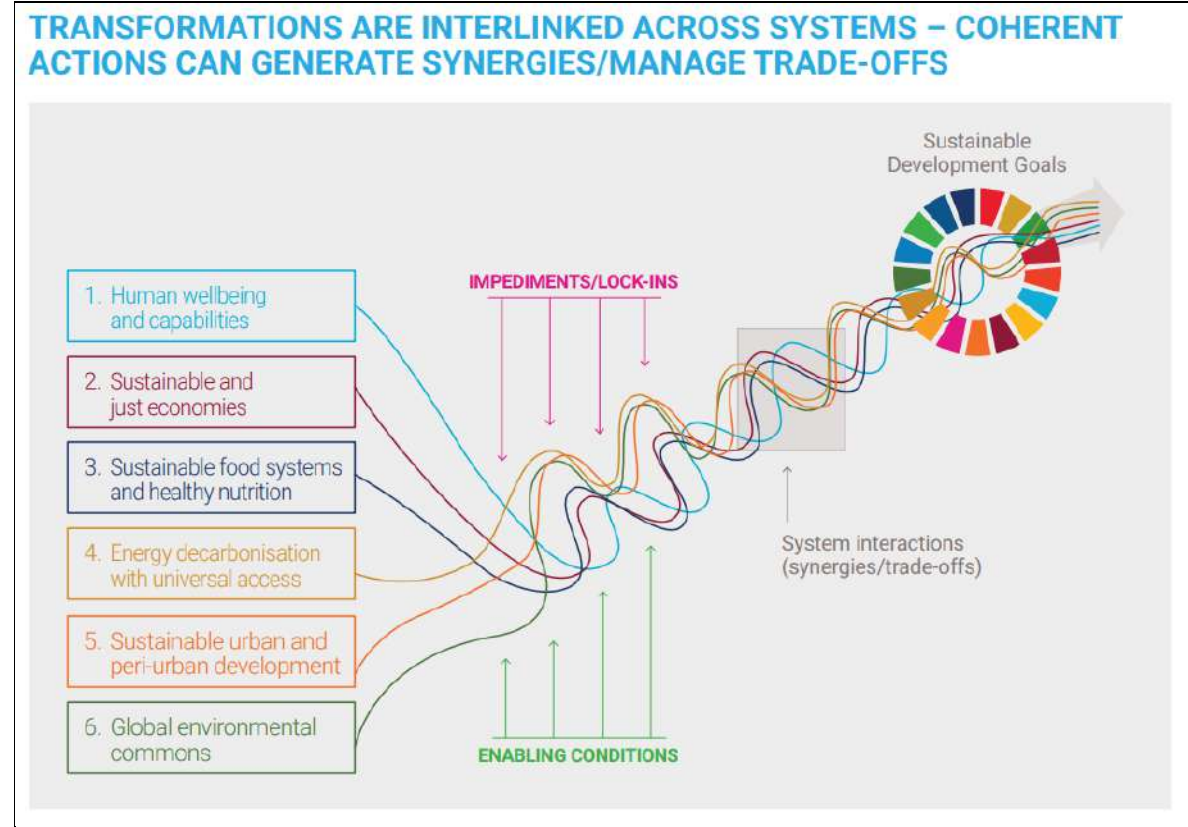
2616 To achieve the SDGs, many systems need to transform simultaneously, so it is essential to
2617 track the interactions between different systems transformations and identify the important
2618 synergies and trade-offs. The transformations required to achieve the SDGs working through
2619 the six entry points summarized in Chapter 3 must be mutually reinforcing (Figure 4-4). For
2620 example, decarbonization of energy systems can achieve climate goals but also destroy jobs
2621 and livelihoods in the fossil-energy industries. This underscores the importance of also
2622 considering ‘just transitions’ that leave no-one behind and ensure a fair distribution of
2623 benefits.

2624 Another consideration relates to how transformations involve interactions across
2625 geographies and scales as raised in chapter 3. Interactions between actors and institutions
2626 from local to global levels allow for sharing good practices and innovations and spreading
2627 ideas across scales. For example, in response to slow progress on climate action at national
2628 and global levels, cities have shown local climate leadership, such as through the C40 Cities
2629 alliance.⁴⁴³

2630 Positive spillovers can also be generated through global technological innovation and
2631 dissemination. For example, decades of investment in innovation and market incentives for
2632 renewable technologies bring cost-effective opportunities for universal energy access in
2633 low-income countries (through ‘leapfrogging’) and could trigger a global-scale acceleration
2634 in the energy transition.⁴⁴⁴ However, tensions and negative spillovers may also occur, for
2635 example where there are barriers to technology diffusion, unequal sharing of benefits and
2636 opportunities, conflicts between jurisdictions and actors, or where desirable transitions to
2637 the SDGs in some jurisdictions impede progress or create set-backs in other jurisdictions.⁴⁴⁵

2638 Calls for transformation do not come without challenges. As figure 4-4 indicates and as
2639 discussed in Chapter 3, there are significant impediments to SDG achievement across entry
2640 points including the lock-in of existing patterns and social and political backlash against
2641 change.⁴⁴⁶ Identifying common impediments to transformation and creating enabling
2642 conditions can underpin a strategic approach for accelerating transformations towards the
2643 SDGs. The five transformation levers introduced in chapter 3 provide the means for various
2644 actors to create these enabling conditions.

Figure 4-4: Multi-system transformations and interlinkages for the SDGs



Source: Allen, C., et al., 2023 Modelling six sustainable development transformations and their accelerators, impediments, enablers, and interlinkages. manuscript under review by *Nature Communications*, DOI: <https://doi.org/10.21203/rs.3.rs-2437723/v1>

As transitions evolve across the S-curves, countries can minimise impediments by creating supportive technological, social and political conditions. They can also work to build trust and consensus, provide the finance, and safeguard against undesirable consequences.⁴⁴⁷ This will require bold leadership, a shared vision and direction, collective effort using the levers in a coordinated way, and mutual accountability. And even if leadership falters at the national level, it can still forge ahead at the local level (Box 4-2).⁴⁴⁸

Box 4-2: Bouaké Sustainable City Project

Bouaké, the second most populated city in Cote D'Ivoire, had remained for years under control of the armed forces, becoming the capital of the rebellion.⁴⁴⁹ The Bouaké Sustainable City project has a budget of \$2 billion over four years and is funded by the city (20 percent) and the European Union (80 percent). The project aims to integrate urban development in the city by strengthening partnerships and resilience in the face of climate change. It develops activities related to participatory and inclusive governance, training and awareness-raising, greening by the network, the inclusion of youth (including 40 percent girls) in the green economy, as well as promoting urban greening, mapping, and geographical information systems.⁴⁵⁰

The following sections unpack the different phases of transformation for SDG achievement and describe the mutually reinforcing use of the five levers – governance, economy and finance, science and technology, individual and collective action, and capacity building.

Phase 1 – Emergence of the new and destabilisation of the old

The Covid-19 pandemic, the wars and violent conflicts in Ukraine, the Sahel and other regions, and the intensifying impacts of climate change create severe shocks. But these

2669 challenges can also trigger experimentation, innovation and learning which are common in
2670 the emergence phase of transformations.

2671 Climate change and food insecurity, for example, are causing people to rethink their diets
2672 (Box 4-3). Partly in response, food systems are likely to be transformed in the next ten years
2673 by a diverse pipeline of technologies including consumer-ready artificial meat, intelligent
2674 packaging, and vertical agriculture.⁴⁵¹

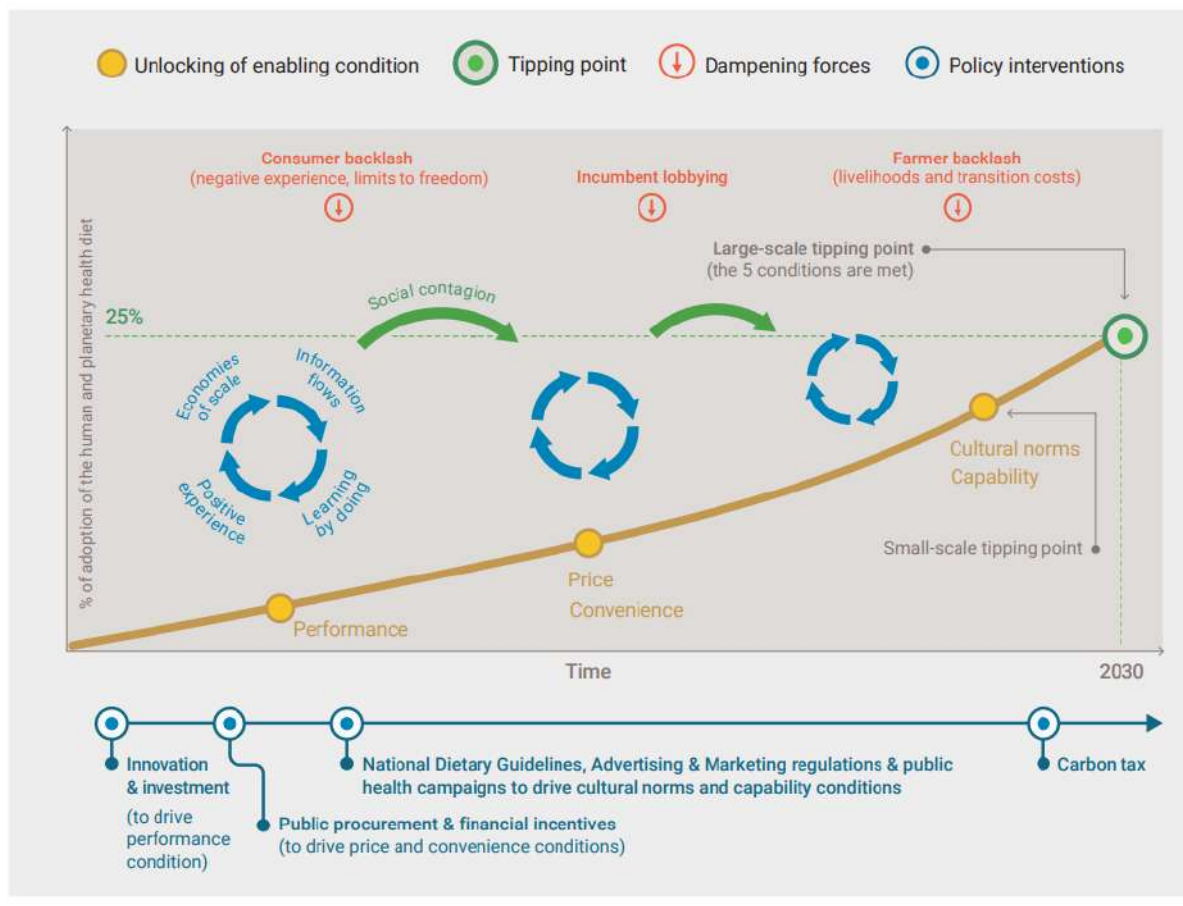
Box 4-3: Tipping-points for healthy diets⁴⁵²

2676 The nutrition-related SDGs require healthier diets supported by sustainable food systems with less
2677 consumption of ultra-processed foods and meats, and more of plant-based foods and whole staple crops.⁴⁵³
2678

2679 In 2019, the EAT-Lancet commission proposed a planetary health diet. The commission illustrated the proposal
2680 in which half of the plate is filled with fruits and vegetables, and the other half primarily with whole grains,
2681 plant proteins such as beans, lentils, pulses, and nuts, unsaturated plant oils, modest amounts of meat and
2682 dairy, and some added sugars and starchy vegetables. The diet is flexitarian and allows for adaptation to
2683 dietary needs, personal preferences and cultural traditions. Vegetarian and vegan diets are two healthy
2684 choices that fall within the planetary health diet.⁴⁵⁴

2685 It has been estimated that a dietary tipping point may be reached in Europe, for instance, in 2030 once a
2686 quarter of the population has adopted the planetary health diet. Momentum can be sustained with a mix of
2687 well-sequenced interventions including public procurement, national dietary guidelines, marketing regulations
2688 and public health campaigns.⁴⁵⁵

SEQUENCED INTERVENTIONS FOR HEALTHY DIETS PRODUCED BY SUSTAINABLE FOOD SYSTEMS – REACHING THE TIPPING POINT



2689

2690 Congestion and pollution in cities is causing urban managers to consider how they can
 2691 improve the quality of city life, and make it more sustainable with nature-based solutions.⁴⁵⁶
 2692 The city of Barcelona, for example, has installed a series of ‘superblocks’ with areas closed
 2693 to motorised vehicles and preference given to pedestrians who can enjoy recreational areas,
 2694 meeting places and green spaces.⁴⁵⁷ In Bandung, Indonesia, in collaboration with businesses
 2695 and other stakeholders, the provincial government is redesigning the street layouts to be
 2696 more liveable, and establishing social areas, where people can sit and relax, including wi-fi -
 2697 enabled benches for children to do their homework, and spaces for celebrating culture,
 2698 festivals and events.⁴⁵⁸ Similarly the city of Chengdu in China, is creating a liveable “park
 2699 city” aiming to reduce the urban heat island effect by expanding green space, building up
 2700 ecological resilience, and providing for leisure and physical exercise.”⁴⁵⁹

2701 New technologies can also create new opportunities for civic participation and digital
 2702 engagement.⁴⁶⁰ For example, in the city of Dar es Salaam in Tanzania, university students
 2703 and local residents have worked on a community-based mapping project, Ramani Huria, to
 2704 create accurate maps of the city’s most flood-prone areas. Data collected from participatory
 2705 mapping is digitised into OpenStreetMap and enhanced with GIS analysis and aerial photos
 2706 from drones to model flood risk and improve planning for resilience.⁴⁶¹ Similarly the user
 2707 generated accessibility application, Wheelogl!, provides an interactive map with accessibility
 2708 information for public and commercial facilities for persons with mobility challenges
 2709 including for wheelchair users.⁴⁶²

For each of the different entry points, and systems transformations there have been many social and governance innovations. In Canada, Germany, Netherlands, and Switzerland, for example, social innovation networks are addressing inequality by experimenting with universal basic incomes. In Argentina and Uruguay cooperative housing organisations are supporting affordable, inclusive housing. In Chile, Hungary and other countries the organisation Via Campesina is promoting social justice and dignity through family farming.⁴⁶³ Another example is the Wellbeing Economy Governments Partnership comprising Scotland, New Zealand, Iceland, Wales and Finland which is pursuing the transition to a wellbeing economy. New Zealand has introduced a ‘wellbeing budget’ that distributes public funding based on wellbeing considerations.⁴⁶⁴

Innovations like these are the product of many different actors experimenting, learning and adapting. During the emergence phase, the innovations may not immediately disturb the status quo, but they can plant the seeds for long-term transformations.⁴⁶⁵

2723 *Levers and actors*

To bring about transformation, actors must apply all five levers – governance, economy and finance, science and technology, individual and collective action and capacity building – and do so in a synergistic way.

Governance – The emergence phase should involve deliberative processes and collective sense-making, as governments and other stakeholders build common narratives and visions, and explore alternative pathways through scenario planning and modelling⁴⁶⁶ – as with Agenda 2063 in the African Union,⁴⁶⁷ the European Green Deal in the EU,⁴⁶⁸ or the Green New Deal in the United States.⁴⁶⁹ Such mission-oriented change requires private and public actors and civil society to recognize that development not only has a rate of change but also a direction aligned with the SDGs. The Fossil Free Sweden initiative is an example of applying governance to align multiple levers to accelerate the climate transition (Box 4-4).

Goal setting is an important global governance strategy, which can emphasize the consequences of policy choices and corporate strategies.⁴⁷⁰ For the private sector, examples include the Science-Based Targets initiative that aligns emission goals with climate science, the RE100 initiative for 100 per cent renewable energy, and actions among businesses to address the use of wasteful packaging materials.⁴⁷¹

In the emergence phase, effective monitoring and analysis of progress can provide vital inputs. The 2030 Agenda encourages Member States to conduct voluntary national reviews (VNRs). As of May 2023, 189 countries had submitted at least one VNR, to a total of 341 since 2015.⁴⁷² Most reviews are conducted by national governments, while some include reviews by stakeholders. VNRs would be more useful if they took the form of evaluations and included more inter-country peer review. In addition, by 2022 local governments had submitted 120 sub-national Voluntary Local Reviews which allowed for new forms of data collection with more participation and inclusion.⁴⁷³

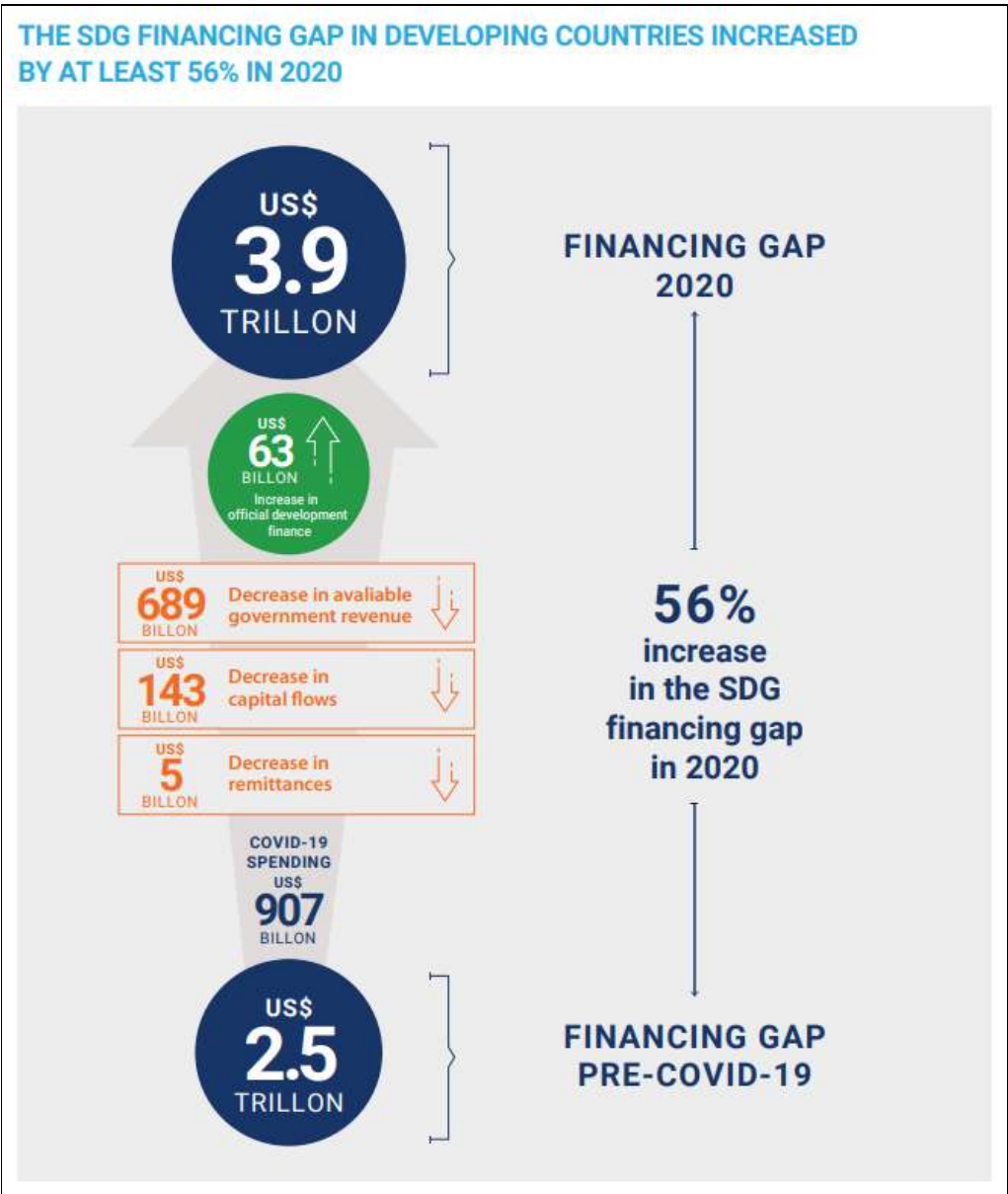
Box 4-4: Fossil Free Sweden – industry roadmaps identifying needed policy change

Ahead of the Paris Agreement in 2015, the “Fossil Free Sweden” initiative was started by the Swedish Government to mobilise companies, trade associations, municipalities, regions and organisations and deliver on the objective for Sweden to become one of the first fossil free nations in the world.⁴⁷⁴ Led by a small

2752 secretariat operating outside of the government ministries, the initiative convened key actors and started
2753 developing industry-led roadmaps. To date, 22 business sectors have developed such roadmaps, including
2754 sectors facing significant challenges in transitioning to net zero emission: agriculture, aviation, heavy transport,
2755 cement, steel, ski resorts, forestry, digital sector, food, and fast-moving consumer goods. The roadmaps have a
2756 dual purpose; to present the sectors' own commitments and to identify and propose policy change. They seek
2757 to outline a roadmap to net zero emissions, but are also built on the assumption that business and industry
2758 need remain competitive. In this way, the initiative has served to internalize the net zero climate targets in
2759 industry and business at large, to the extent that they develop their own pathways and become active
2760 stewards. Further, business and industry have proactively demanded policy change and clear regulatory
2761 frameworks that support implementation of their roadmaps. In this way, Fossil Free Sweden can be seen as a
2762 governance innovation, that could potentially be replicated in other places and with a view towards other
2763 societal objectives.⁴⁷⁵

2764 *Economy and finance* – It has been estimated that achieving the SDGs could require
2765 additional annual investments of \$1.4 trillion to \$2.5 trillion,⁴⁷⁶ though because of COVID-19
2766 the cost could now be \$4.2 trillion.⁴⁷⁷ The gaps are certainly large (figure 3-5), but they are
2767 equivalent to only 1.1 per cent of the \$379 trillion of total financial assets held by banks,
2768 institutional investors and asset managers.⁴⁷⁸

2769 **Figure 4-5: The SDG Financing Gap**



2770
2771
2772

2773 To fill the gaps and give governments some space to foster ideas in the emergence phase,
2774 innovative financing mechanisms need to be used. These include SDG bonds, still very much
2775 a work in progress, which can help developing countries access international financial funds.
2776 Mexico issued SDG Sovereign Bonds in 2020 and 2021.⁴⁷⁹ Many countries are already
2777 dealing with crushing debt repayments and interest. Barbados, Belize and Seychelles have
2778 issued climate for debt swaps or blue bonds.⁴⁸⁰ Developed economies, international
2779 financial institutions and multilateral development banks will need to support reforms that
2780 enable highly indebted countries to avert further worsening fiscal conditions.⁴⁸¹

2781 Governments, multilateral development banks, private finance, philanthropists and others
2782 will need to support the piloting, prototyping and commercialization of new knowledge. In
2783 developing countries, private finance is often prohibitively expensive so transformation will
2784 rely more on public finance.⁴⁸² Grants and concessional finance are also needed to offset

public debt and debt-servicing costs, particularly in the poorest countries which need comprehensive debt relief. Game-changing visions for finance are also important. The Bridgetown Initiative launched in advance of COP27 includes five specific proposals to make the global financial system more responsive to the climate and development crises (Box 4-5).⁴⁸³

Box 4-5: Bridgetown Initiative: making financial markets work for the Paris Agreement and the SDGs

While high-income countries borrow in the market at rates one to four per cent, lower-income countries, which are perceived as riskier, are charged an average of 15 per cent.⁴⁸⁴ In these circumstances low-income countries find it difficult to fund the cost of technological advances, infrastructure, and investments for the transformation to low carbon economies. In 2022, the Bridgetown initiative proposed a Climate Mitigation Trust, that would borrow on the international capital markets and then lend for green investments in developing countries. The aim is to draw on up to \$5 trillion of private finance.⁴⁸⁵

Bridgetown also calls on the World Bank and regional development banks to take a new approach to risk ratings, making more concessional lending available for adaptation. Bridgetown also advocates for a tax on oil companies to finance reconstruction following climate disasters. To provide relief from crushing debt-servicing payments it also calls for outstanding loan repayments to be temporarily paused when a country undergoes a climate disaster.⁴⁸⁶

While some investors are moving toward sustainable and ESG investment by selecting ESG indices,⁴⁸⁷ some other investors, such as public pension funds, argue that they cannot move in new directions because they have to follow regulations, avoid risk, and maximise returns to shareholders.⁴⁸⁸ In these cases, governments should alter the rules of the game, sending clear market signals through new regulations and providing credible long-term policies and targets.⁴⁸⁹ For example, to encourage people to use renewable energy or electric vehicles, governments can introduce tax rebates, require electricity providers to offer feed-in tariffs, or provide purchase subsidies.⁴⁹⁰

Science and technology – Food, energy, transport, health and urban systems are often driven by innovations that come from academic, government and corporate laboratories. In the quest for sustainable oceans, for example, these institutions have contributed technologies such as remote sensing, artificial intelligence, and machine learning that provide valuable information for marine spatial planning.⁴⁹¹ Scientific research, if well-communicated and accessible to those who need it, can help to build awareness of critical challenges and stimulate experimentation.

The science and technology lever can be “pushed” – for example, through investments in universities and other research institutions earmarked for research relevant to the SDGs. Some awarding schemes include financial and scaling support as a prize, such as the case of The Earthshot Prize.⁴⁹² But it can also be “pulled” through interventions that create demand, as with Japan’s Sunshine Project, the German Renewable Energy Sources Act, and the Southern African Solar Thermal Training and Demonstration Initiative (Box 4-6).⁴⁹³

Box 4-6: Southern African Solar Thermal Training and Demonstration Initiative

In the Southern African Development Community region, 80 percent of electricity is generated from coal. The Southern African Solar Thermal Training and Demonstration Initiative SOLTRAIN is a regional initiative that supports countries in changing from a largely fossil-energy supply system to a sustainable supply structure based on renewable energy, and particularly on solar thermal.⁴⁹⁴

2830 Key components include training and internships for artisans and engineers on design and installation of solar
2831 water heaters, and advocacy for replacement of electric geysers with solar water heaters. By the end of
2832 September 2022, over 3,000 people had been trained in 110 courses and 320 solar thermal systems had been
2833 installed.⁴⁹⁵

2834 In order to support broad rollouts of solar thermal systems in all six countries in the initiative, solar thermal
2835 roadmaps and implementation plans were developed in broad stakeholder processes in close cooperation with
2836 ministries and governmental bodies. Social institutions also provided funding to install solar water heaters in
2837 their infrastructure. This initiative promotes energy access, poverty alleviation, decarbonization and
2838 inclusion.⁴⁹⁶

2839 *Individual and collective action* – In the emergence phase this can involve micro-level
2840 actions, such as individuals changing consumption patterns, or meso-level actions, such as
2841 workers' cooperatives and community energy projects, or through feminist movements, or
2842 political lobbying such as the Fridays for the Future youth movement (Box 4-7).⁴⁹⁷ Here, too,
2843 the current spate of crises can spur new behaviours and patterns.

2844 **Box 4-7: The African Youth SDGs Summit**

2845 The United Nations High-Level Political Forum (HLPF) and its preparations and related processes can provide a
2846 fruitful capacity-building experience for people within and outside governments, particularly when countries
2847 nurture inclusive approaches. In 2022, Youth Advocates Ghana, in collaboration with Talent Youth Association
2848 Ethiopia, the United Nations Association of Ethiopia and the Office of the UN Resident Coordinator in Ethiopia,
2849 convened an African Youth Summit in Addis Ababa.⁴⁹⁸ The Summit included capacity strengthening sessions for
2850 40 youth groups, consultations with state institutions, and sessions on strategies that networks can adopt to
2851 restructure their programmes and mobilise resources to build back from COVID-19.⁴⁹⁹
2852

2853 In 2019, protests in Chile against high inequality spread to the rest of Latin America and
2854 were also echoed in the Middle East. There have also been social movements for women's
2855 equality notably in Iran. If governments are to encourage behaviour change, they have to
2856 address structural barriers and social movements can be the impetus.

2857 *Capacity building* – The emergence phase also requires the capacity to innovate and
2858 generate sustainable alternatives – and provide informal and protected spaces for
2859 innovation and dialogue (Box 4-8).⁵⁰⁰ Certain capacities may be required for effective
2860 governance and policy implementation. For example, increasing capacity in health
2861 technology assessment can help focus limited government resources on essential and useful
2862 health technologies and interventions that help speed up the implementation of universal
2863 health care.⁵⁰¹ Capacities are also needed in setting strategic direction and the use of
2864 foresight and scenario analysis methods. Countries may also need to refine ideas, practices
2865 and technologies and encourage people to switch to new systems such as rapid energy-
2866 efficient transit transportation systems and move to more sustainable forms of
2867 consumption, or to contraception to empower women to choose their family sizes.⁵⁰²

2868 **Box 4-8: Backyard Farming in the Bahamas**

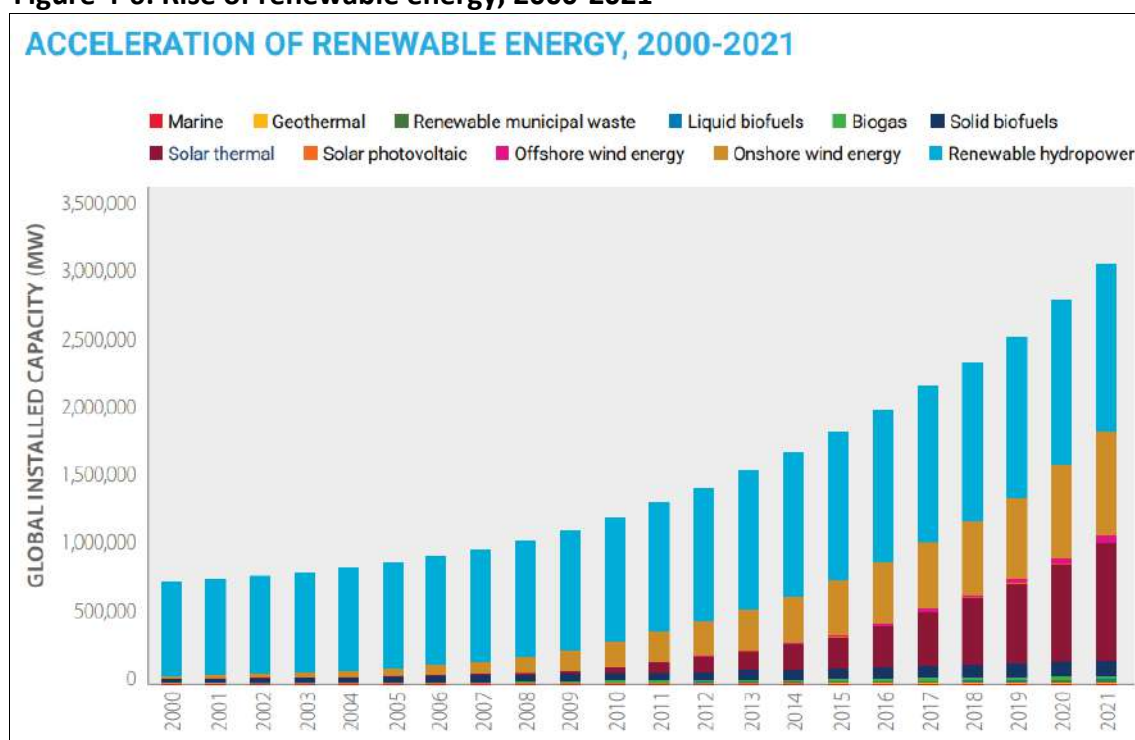
2869 Launched in 2008, the Backyard Farming project in the Bahamas is an effort to strengthen food security in an
2870 import-dependent country and increase technical knowledge in economically depressed communities.⁵⁰³ It has
2871 been spearheaded by women and girls who are the primary food producers in homes and has led to an
2872 increase in technical skills for rural communities. In 2020, as the country struggled with food-import and
2873 supply-chain issues related to the COVID-19 pandemic. The Government distributed 30,000 backyard kits, as
2874 well as hydroponic kits to grow leafy greens, and is working to allocate 50,000 more in the near future.⁵⁰⁴
2875

Phase 2 – Acceleration of the new and breakdown of the old

After they emerge, innovations can eventually reach a ‘tipping point’ – with a rapid acceleration beyond which it is hard to reverse.⁵⁰⁵ Tipping points can be difficult to predict, but they often coincide with major societal shifts in perspectives such as feelings about single-use plastic, or when innovations suddenly become easier to use or more socially desirable, as happened with the smartphone.⁵⁰⁶ They can also become cheaper as with renewable energy through solar and wind installations and the development of complementary technologies⁵⁰⁷ (figure 4-6).

Importantly, there are also negative tipping points, beyond which it is impossible to diverge from a damaging or dangerous trajectory. This is the case for a number of environmental “points of no return,” including climate change and biodiversity loss that are threatening ecosystem collapse which will have negative implications for many SDGs. But there can also be social, economic and governance tipping points when inflation, corruption and conflict lead to failed states.⁵⁰⁸

Figure 4-6: Rise of renewable energy, 2000-2021



Source: Global Energy Outlook

There are many examples of technologies and innovations accelerating. This was the case for cooking stoves in China from the 1980s. The Ministry of Agriculture sponsored the National Improved Stove Program, which between 1982 and 1998, helped increase penetration of improved stoves from less than 1 per cent to 80 per cent.⁵⁰⁹ Another important example is that of lighting in Sweden which was able to phase in energy-efficient lighting in commercial buildings in about nine years, using a multi-pronged approach of standardization and quality assurance, direct procurement, stakeholder involvement, government subsidies, and pilot demonstrations.⁵¹⁰

2901 Innovation can be given a sudden jolt by shocks or crises – creating windows of opportunity
 2902 for new technologies, practices and norms. COVID-19, for example, has accelerated the use
 2903 of virtual meetings, and more flexible work practices around the world. And in many
 2904 developing countries the pandemic spurred governments to support struggling workers and
 2905 households by expanding systems of social protection (Box 4-9). Powerful actors may also
 2906 add their support and influence new ways of thinking, doing and acting, as has happened
 2907 with the electric car.

Box 4-9: Universal social protection is boosted by crises

2909 Social protection is the set of policies and programmes designed to ‘reduce and prevent poverty and
 2910 vulnerability throughout the life cycle’. This includes health protection along with benefits for children and
 2911 families, maternity, unemployment, and employment injury, as well as for sickness, old age, and disability.
 2912 National social protection systems address some or all these areas through a mix of contributory schemes,
 2913 social insurance, and non-contributory tax-financed benefits, including social assistance.⁵¹¹

2915 A century ago, few countries had social protection systems and by 2017, only 45 per cent of the global
 2916 population were effectively covered by at least one social protection benefit. The remaining 55 per cent – as
 2917 many as 4 billion people – were left unprotected.⁵¹² SDG 1.3 calls upon countries to implement nationally
 2918 appropriate social protection mechanisms for all, including floors. A ‘social protection floor’ ensures that over
 2919 the lifecycle all those in need can afford and have access to essential health care and have income security at a
 2920 nationally defined minimum level.

2921 Many developing countries have a bifurcated system with support going primarily to two groups. The first
 2922 comprises workers in the formal sector who receive benefits corresponding to their contributions and those of
 2923 their employers. The second comprises people living in poverty who are targeted to receive tax-funded ‘social
 2924 assistance’ in the form of cash, vouchers, or benefits in-kind such as school meals. They may also receive
 2925 conditional cash transfers – payments conditional, for example, on their children going to school or attending
 2926 medical clinics. They may also earn wages from employment in public works programmes. This can leave a
 2927 ‘missing middle’ of people who are not in poverty but earning modest incomes in the informal economy, or
 2928 people who form part of the emerging middle class yet are vulnerable to sudden shocks such as a loss of
 2929 employment or catastrophic health expenditures.⁵¹³

2930 During the COVID-19 pandemic, governments acted quickly to protect their citizens. According to the World
 2931 Bank, during the pandemic, 203 countries increased their coverage. Around two-thirds of expenditure was on
 2932 social assistance,⁵¹⁴ most in the form of cash transfers, and in-kind and food transfers and the rest on labour
 2933 market programmes and social insurance.⁵¹⁵ In 2020-2021, social protection expenditure reached \$3 trillion –
 2934 4.5 times higher than was spent in the 2008-2009 financial crisis. However, more than 60 per cent of this total
 2935 was in the United States.⁵¹⁶

2936 As with social protection generally, it proved difficult to reach informal workers. In Latin America these
 2937 included people who were not poor enough to qualify for cash transfers but also did not qualify for
 2938 unemployment schemes based on public or private insurance. Nevertheless, the lockdowns and economic
 2939 downturn put them at high risk and during the worst parts of the pandemic many lost their livelihoods.⁵¹⁷ In
 2940 Africa, too, many informal workers were left out.⁵¹⁸

2941 In September 2022, to fight inflation and the cost-of-living crisis, governments announced or implemented a
 2942 total of 609 additional social protection and related measures across 158 economies.⁵¹⁹ Countries need to
 2943 constantly improve and update information systems on poor and vulnerable groups. To be more inclusive,
 2944 datasets should go beyond the extreme poor and include the next income brackets and vulnerable
 2945 populations.⁵²⁰

2946 The pandemic illuminated major blind spots in the labour market, including informal and self-employed
 2947 workers and highlighted the need to rethink unemployment insurance, social assistance and other tools. It also
 2948 encouraged new forms of financing, such as the monotax in Argentina, Brazil and Uruguay and sin taxes in

2949 Mauritius, Panama, Tunisia and the Philippines.⁵²¹ The current cost-of-living crisis may also encourage other
2950 financing options, aligning taxation with SDGs and innovative earmarked taxes.⁵²²

2951 However, early success in innovative technologies and practices does not directly translate
2952 to scale-up, acceleration and wider societal adoption. During the acceleration phase
2953 progress can be slowed by high financing costs, lower risk-reward profiles, and inertia in
2954 market design and business models.⁵²³ Capturing, documenting, review and evaluation, and
2955 then situating learnings from early interventions is key to later and ongoing success.
2956 Conflicts, tensions and political struggles are also common in the acceleration phase, as
2957 different actors, interests and coalitions may seek to promote or delay the transition.

2958 *Levers and actors*

2959 During the acceleration phase transitions can be steered by judicious use of the five levers.

2960 *Governance* – Proactive and decisive governments can shape markets, by stimulating
2961 research and innovation, investing in public infrastructure, setting targets and regulating
2962 businesses.⁵²⁴ This entails an interventionist and deliberate government, ideally reorienting
2963 economic activities towards sustainable development goals.⁵²⁵ Early interventions are
2964 generally easier and can build a foundation for later activities that are harder to implement
2965 and more controversial.

2966 There can, however, be internal conflicts or trade-offs within government. Political leaders
2967 must often balance the goals of different ministries – as economic ministries argue for
2968 boosting food consumption and car production, for example, while health ministries worry
2969 about obesity and air pollution.

2970 In addition, there can be competing voices within ministries – for agriculture, for example,
2971 where a more widespread use of biomass for biofuels has increased the risk of
2972 monocultures that compete with food production.⁵²⁶ It is important to have horizontal
2973 policy coordination across different portfolios and ministries to ensure coherence, as well as
2974 across levels of government (Box 4-10).⁵²⁷ For example, in Germany not only does the
2975 Federal Chancellery have a coordination role, it is also steering the policy process and
2976 providing important inputs to relevant ministries.⁵²⁸ In Canada, the Federal Sustainable
2977 Development Act has designated lead departments and agencies for each of the 17 SDGs.⁵²⁹

2978 **Box 4-10: Cross-ministry efforts in food systems**

2979 *Brazil* — The school catering system dates back to the 1950s.⁵³⁰ Since 2009, however, the Government has
2980 radically changed the system, through the National School Feeding Program (PNAE) which uses public
2981 procurement and works with various ministries to simultaneously advance food security, education and rural
2982 development objectives.⁵³¹ PNAE offers a premium of up to 30 per cent for certified organic and agro-
2983 ecological products. The programme also uses at least 30 per cent of its budget to purchase from local family
2984 farmers, helping integrate them into markets for specific local foods and alternative trade networks.⁵³² PNAE
2985 has proved successful at reducing child malnutrition, increasing access to healthy foods, improving eating
2986 habits, and reducing school absenteeism.

2988 *France* – In 2001, France instituted a food policy that aims to ensure that the population has access, under
2989 conditions that are economically acceptable to all, to safe, diverse food in sufficient quantity, of good taste and
2990 nutritional quality, and produced under sustainable conditions.⁵³³ The second national food programme
2991 developed in 2014, advocates the establishment of ‘territorial food projects’ (TFPs) to bring together

2992 producers, processors, distributors, local authorities, civil society actors and consumers.⁵³⁴ The management
2993 and coordination of the TFP system has been carried out within the General Directorate of Food by a sub-
2994 directorate that relies on correspondents in the social ministries.⁵³⁵

2995 From 2014 to 2020, 181 TFPs were created. France's recovery and resilience plan following COVID-19
2996 increased the number of TFPs to 332, reaching 45 million people, or about two-thirds of the population.

2997 Acceleration is usually accompanied by breakdowns of existing systems – which often
2998 causes distress for workers, as has happened in manufacturing and coal mining
2999 communities.⁵³⁶ Governments can ameliorate this by investing in training for workers. In the
3000 Republic of Korea, the 2021 Carbon Neutrality Act requires the Government to address
3001 “inequality that could arise in the societal transition to carbon neutrality” and provides for
3002 support to populations vulnerable to both climate change and loss of jobs related to climate
3003 action, and also stipulates support for small enterprises and support for reemployment.⁵³⁷

3004 Governments can also help ensure just transitions by increasing social protection (Box 4-11).
3005 An emerging approach is ‘adaptive social protection’ which integrates social protection with
3006 disaster risk reduction and strategies for climate change mitigation and adaptation.⁵³⁸
3007 Adaptive social protection can help communities become more resilient and better able to
3008 cope with shocks. This may be through payments for environmental services, or for
3009 employment in public works programmes to build disaster-resilient infrastructure.⁵³⁹

3010 Social protection can also help accelerate the attainment of other SDGs. For example, in the
3011 Philippines, coupling cash transfer programs to specific prerequisites such as utilizing of
3012 prenatal care for pregnant women and immunisation of children between 0 – 5 years has
3013 helped increase the utilisation of such basic health services for the attainment of universal
3014 health care.⁵⁴⁰

Box 4-11: Social protection enables just transitions to low-carbon economies

3016 The transition to green energy and low carbon economies requires the phase out of fossil fuel-based energy
3017 and other high-emissions technologies, inevitably resulting in losses of employment in these industries. It has
3018 been estimated that between 2021 and 2030, in the United States, 12,000 workers in the coal industry will
3019 lose their jobs each year, and over the period 2031-2050 as oil and gas use decrease, about 34,000 workers in
3020 these industries will lose their jobs each year.⁵⁴¹

3022 These impacts can be cushioned by agile social protection systems. In countries that provide universal social
3023 protection, workers supported by benefits, including employment and health insurance are in a better position
3024 to find new lines of work. In South Africa in 2022, for example, a presidential commission presented a
3025 Framework for a Just Transition, which recommended income support for workers and communities impacted
3026 by green transitions.⁵⁴² One problem is that the benefits from green transitions are not necessarily in the areas
3027 that bear the brunt of shut-down industries, as recognised by Chile in its Strategy for a Just Energy Transition,
3028 and by the province of Alberta in Canada.⁵⁴³

3029 Effective mechanisms for SDG accountability are needed – at all levels and in all sectors – to
3030 ensure that decision-makers are answerable for results on transformation towards the
3031 SDGs. A 2020 survey of peoples’ perception of government accountability on the SDGs
3032 found perceived accountability highest in Europe and in Asia and the Pacific and lowest in
3033 the Middle East.⁵⁴⁴ The Voluntary National Reviews (VNRs) provide one mechanism for
3034 regular and inclusive reviews of national progress towards the SDGs.

Economy and finance – To accelerate progress, existing financial mechanisms need to be improved in order to deliver tangible results, within a well-aligned domestic and international financial architecture. To support these efforts UNDP has integrated national financing frameworks (INFFs) to strengthen the links between aspirations and the financing strategy that aligns with the SDGs. By 2022, 86 countries had designed at least 250 reforms to mobilise and align both private and public finance for sustainable development.⁵⁴⁵

Most countries have also been affected by the economic fallout of the COVID-19 pandemic and the conflict in Ukraine.⁵⁴⁶ In a fraught financial climate, governments are finding it more difficult to generate sufficient domestic revenue and there is increasing pressure on ODA. With high inflation and high interest rates, many are strained by debt servicing costs. At the same time, private capital flows to developing countries have been increasingly volatile. Credit rating agencies have downgraded their sovereign ratings and many developing countries are finding it difficult to access the international capital markets.⁵⁴⁷

It will take political leadership to shift resources to better serve people and the planet and ensure that no one is left behind. This will also mean re-evaluating what counts as national success beyond traditional GDP yardsticks and measuring the right things (Box 4-12).

Box 4-12: Beyond GDP: Measuring sustainable progress as a key accelerator

Gross Domestic Product (GDP) is the market value of all the final goods and services produced and sold in a specific time period. This has become the standard measure of a country's progress but has many limitations and may be leaving out more than it captures. It does not, for example, take into account the degradation and depletion of the environment. The activity of tearing down a forest, for example, is likely to show up as GDP growth.⁵⁴⁸

Target 17.19 of the SDGs says to build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product. Many alternatives and complements to GDP have been proposed over the years, but none has displaced GDP as the main indicator of progress.⁵⁴⁹ Perhaps the earliest alternative to GDP is Bhutan's Gross National Happiness. Proposed first in 1972 by the 4th King of Bhutan, King Jigme Singye Wangchuck, it has supported policy-making in the country.⁵⁵⁰ Also, the World Happiness Index, now in its 11th year is used to assess the progress of nations on a range of indicators including subjective wellbeing.⁵⁵¹

Another alternative to GDP is the human development index (HDI) which evaluates a country's progress in education, health, and income.⁵⁵² With the rising intensity of the climate and biodiversity crises, the world needs metrics that capture nature and planetary aspects, such as in the HDI adjusted to planetary boundaries.⁵⁵³ Similarly, UNEP has proposed to consider Inclusive Wealth and reports on this every two years to track progress on the sustainability of economy and wellbeing.⁵⁵⁴ Other measures include the Social Progress Index (SPI), which is calculated by the Social Progress Imperative group led by Michael Green⁵⁵⁵ and is influenced strongly by the ideas from Amartya Sen, Douglass North, and Joseph Stiglitz. SPI is based on 12 components, from nutrition and basic medical care to access to advanced education. The Index has 60 indicators in total. In 2022, Norway, Denmark, Finland, Switzerland, and Iceland were in the top five for SPI, while the biggest improvers included countries such as Sierra Leone, The Gambia, and Uzbekistan. The Legatum Institute⁵⁵⁶ has been calculating the Prosperity Index, to rank prospects of economic growth, since 2007, using data from 12 pillars and 67 policy-focused elements.

The UN has introduced the System of Environment-Economic Accounting (SEEA) which includes a dashboard of indicators that capture the health of the economy and the natural assets of a country. The SEEA Central Framework, adopted in 2012, can help countries understand and track their greenhouse gas emissions, their material consumption, and their productivity of resource use.⁵⁵⁷ SEEA Ecosystem Accounting, adopted in 2021, measures the size and health of ecosystem assets.⁵⁵⁸

3082 The UN Statistical Commission is in the process of revising the global System of National Accounts (SNA) by
3083 2025. Important considerations during this revision are measuring sustainability, and valuing nature and other
3084 aspects of the economy that are not captured by GDP. The SNA is followed by all countries when measuring
3085 their economies. No country wants to adopt a new yardstick of progress unless all the others do so. Sufficient
3086 momentum needs to be built to make sure all countries align and make the shift.⁵⁵⁹

3087 Another important component is SDG budgeting – to assess needs and allocations and track
3088 the public expenditure at all levels of government.⁵⁶⁰ A survey of 60 countries plus the EU
3089 showed that only around a third mentioned the SDGs or related terms in their official
3090 budget documents, and far fewer referred to the SDGs as central pillars in their COVID-19
3091 economic recovery plans.⁵⁶¹ In 2021, 35 countries reported integration of the SDGs into
3092 national development policy frameworks, and 25 into local plans to align their budgets with
3093 the SDGs.⁵⁶²

3094 While these initiatives and financing instruments can help, progress has been slow. For
3095 example, the INFF initiative is voluntary, and SDG budgeting is slowed by a lack of capacity
3096 while private capital markets for SDG bonds have yet to be fully explored.

3097 Governments can stimulate the necessary investment for SDGs by shifting subsidies and
3098 incentives, which can hasten critical tipping points for new technologies and practices. For
3099 example, by shifting away from support for the fossil fuel industry and redirecting subsidies
3100 towards sustainable alternatives. Between 2015 and 2020, 34 countries reformed consumer
3101 subsidies, 14 countries increased fossil fuel taxation, and seven countries did both.⁵⁶³
3102 Cutting tax avoidance by multinational enterprises can also provide much needed domestic
3103 revenue for public investments in the SDGs.

3104 While public finance, venture capital and private equity can be important during the
3105 emergence phase, banks and institutional investors are important for the later
3106 commercialisation and diffusion stages⁵⁶⁴ which should also be supported by the
3107 government. A survey of investment and venture capital professions in Europe and North
3108 America, for example, found that when choosing whether to invest in renewables they
3109 considered the most encouraging element to be the availability of feed-in tariffs.⁵⁶⁵

3110 To overcome system lock-ins, it may be necessary to erode the financial resource base,
3111 legitimacy and political support of unsustainable industries, technologies, institutions and
3112 practices.⁵⁶⁶ Enterprises too need to reassess their viability and prospects. For example, over
3113 1,500 institutions worldwide have made fossil-fuel divestment commitments,⁵⁶⁷ which is
3114 also seen as an important positive tipping point for acceleration.⁵⁶⁸

3115 For the private sector, supply chain management is one way to accelerate action. Apple and
3116 Volvo's call on global supply chains to decarbonize by 2030 and 2050 respectively are
3117 examples of utilizing convening power to influence supply chains for SDG
3118 implementation.⁵⁶⁹ Certification and standardization programmes are also important
3119 devices for accelerating actions. International certificate schemes such as the Forest
3120 Stewardship Council (FSC), Marine Stewardship Council (MSC), Fairtrade and Roundtable on
3121 Sustainable Palm Oil (RSPO) help to change consumer behaviour as well as to provide
3122 incentives for resource mobilisation.⁵⁷⁰

Countries also need to expand their concept of capital. Current economic accounting systems severely undervalue natural capital (Box 4-13). In 1997, ecosystems goods and services were valued, for the first time at \$33 trillion per year, almost twice the then global GDP.⁵⁷¹ One initiative that takes this into account uses ‘payments for ecosystem services’ – rewarding landowners for protecting their land to ensure clean water, habitats for wildlife, or carbon storage in forests, such as in cloud forest watersheds in Peru.⁵⁷² There has also been progress in the use of environmental accounting and natural capital valuation in frameworks such as the System of Environmental-Economic Accounting, which integrates economic and environmental data to provide a more comprehensive and multipurpose view of the interrelationships between the economy and the environment.⁵⁷³

More generally, public financial institutions need to recognize that nature must be an integral part of fiscal policy, budgets, and investments, especially regarding climate risks and adaptation plans. The OECD is currently supporting efforts to create a national database for ocean accounting.

Box 4-13: Food security, and creating an enabling environment to finance a sustainable ocean economy

When the value of natural capital and assets are rarely included in economic indices of progress, what is the transformation path forward? The oceans are a global commons that underlies culture and history through both its intrinsic value, as well as its provision of coastal livelihoods. Globally, in 2020, around 58.5 million people were directly employed in the fisheries and aquaculture sector, and an estimated 600 million people were dependent on fisheries for their livelihoods.⁵⁷⁴ Despite efforts, anthropogenic threats to ocean health are deepening.⁵⁷⁵ An international research group have come up with a conceptual framework towards creating an enabling environment to attract financial investment in sustainable activities. The goal is a Sustainable Ocean Economy (SOE).⁵⁷⁶

In the last decade, less than 1 per cent of the estimated USD 1.5 trillion economy⁵⁷⁷ was of philanthropic and Official Development Assistance (ODA) origin.⁵⁷⁸ One of the major barriers to attracting investment in sustainability is that the majority of public sector subsidies are directed to unsustainable activities, like oil and gas development. Public sector “capacity-enhancing” subsidization of fisheries, which can lead to over-capacity, accounted for 63 per cent of USD 35.5 billion in public subsidies in 2018.⁵⁷⁹ Redirecting public sector subsidies towards social equity, sustainability and food security would align public financing with Agenda 2030 goals. There are signs of progress. Since the early 2000s, the WTO had been negotiating an agreement to end subsidies for illegal, unreported and unregulated fishing and limit harmful “capacity-enhancing” subsidies that lead to overfishing. An agreement was reached in July 2022. Progress is evident, but input is still necessary.⁵⁸⁰

What is a true valuation of the ocean’s ecosystems goods and services? The ocean provides food, regulates habitat, climate, sequesters carbon, controls erosion and so much more. When goods and services are not factored into economic decisions, their subsequent degradation increases our risk of failure, especially in an era of climate change. Ecosystem goods and services can be evaluated and used in policy and planning.⁵⁸¹ Admittedly, there is much work to be done but there has been progress and the Global South is leading the way through a range of initiatives, including its prominent role on the High-Level Panel for Sustainable Ocean Economy.⁵⁸²

Science and technology – As emerging science and technologies mature and become more competitive, they also become self-reinforcing through positive feedback.⁵⁸³ As the transformation progresses and users express their preferences, governments can work with industries on various types of standardization. This might require them to invest in corresponding infrastructure such as charging points for electric vehicles and strengthening public transport systems. In many cases, technologies diffuse through markets, but in other cases, for example in agriculture, diffusion can be facilitated through extension agents. All

levers can be applied together through partnerships to align emerging science and technologies with SDG achievements (Box 4-14).

Box 4-14: AI for the Global Goals

Opportunities for leveraging AI for SDG attainment are unbounded and need to be harnessed. Google has launched AI for the Global Goals, which will bring together research, technology, and funding to accelerate SDG progress. This commitment will include \$25 million to support NGOs and social enterprises working with AI to accelerate progress towards the Goals.⁵⁸⁴

With the AI capabilities and financial support from Google, grantees may be able to halve the time or cost needed to achieve their goals. In addition to funding, Google will provide fellowships where teams of Google employees work alongside organisations for up to six months.⁵⁸⁵ Importantly, projects will be open source so other organisations can build on the work.

AI lighthouse is another initiative with intelligence projects focused on the protection of the environment, climate, nature and resources with approximately 100 Million € committed to date.

Individual and collective action – Governments at all levels can influence, incentivize and constrain actions and behaviours.⁵⁸⁶ But conversely, individual and collective action can also exert influence on policy making, via voting, advocacy and protest. Individuals and groups can also motivate action by firms, through their consumption choices or as stockholders – particularly on environmental, social, and governance issues (Box 4-15).⁵⁸⁷ One study found that shareholder proposals on ESG reporting issues led to increases in transparency and more integrated reporting.⁵⁸⁸

Box 4-15: Corporations and foundations for the SDGs

Environmental, social and governance (ESG) was first mentioned in a 2004 report published/endorsed by 18 financial institutions from 9 countries and overseen by the UN Global Compact.⁵⁸⁹ Global sustainable investments reached over \$35 trillion USD in 2020, up from \$30.6 in 2018 and \$22.8 in 2016,⁵⁹⁰ and ESG assets are expected to exceed \$50 trillion by 2025, representing more than a third of the projected \$140.5 trillion in global assets under management.⁵⁹¹

Amidst an overall declining trust in institutions, people are looking to the private sector to fill that gap – holding CEOs and businesses to a new standard of leadership. According to one survey, business has emerged as the most trusted institution (61%), followed by NGOs (59%) and governments (52%).⁵⁹² There is increasing stakeholder support for sustainability, and investors are engaging in conversations about long-term growth and ESG-integrated investment decisions.

Multinational corporations with international partnerships and considerable financial capacity can drive socio-economic development through investments that improve living conditions.⁵⁹³ Corporate foundations - rather than limiting their sphere of activity to financial intermediations of corporate philanthropic funds - may actively contribute to the achievement of the SDGs by acting as broker organizations in cross-sector collaborations for the SDGs.⁵⁹⁴ Their potential for supporting the SDGs needs to be further explored in research and policy discussions.⁵⁹⁵

Two recent cases illustrate the potential. The Etisalat Corporation implemented STEM camps for girls, and career-counselling session for students of secondary schools across the country aimed at sharing knowledge of tertiary education career opportunities. Results from a qualitative analysis based on interviews of main stakeholders and actors involved indicate improvements in infrastructure and learning outputs (including teachers training), technology, and innovation among others.⁵⁹⁶

3218 In 2022, the Bill & Melinda Gates Foundation, Open Society Foundations, and The Rockefeller Foundation
 3219 announced a new grant fund aimed at innovative solutions and approaches that empower multilateral
 3220 development banks (MDBs) to provide more financing to developing and emerging economies.⁵⁹⁷ With an initial
 3221 commitment of up to \$5.25 million, the MDB Challenge Fund will help accelerate financing with technical
 3222 assistance to address potential barriers to leveraging shareholders' capital contributions; operational funding
 3223 pilot programs or parts of programs to implement the G20 report's recommendations and promote MDB reform
 3224 initiatives for subsequent scaling; policy analysis to support policy changes necessary to build on the G20
 3225 recommendations and institutionalise and scale innovative solutions.⁵⁹⁸

3226 *Capacity building* – The acceleration phase requires the capacity to assess, situate and learn
 3227 from experience, and revise course accordingly. Important capacities during acceleration
 3228 include coordination across various actors and resolving conflicts and trade-offs as they
 3229 arise, and in identifying and overcoming other common impediments and system lock-ins.
 3230 Since it is impossible to predict how things will transpire, local learning capacity is essential,
 3231 as is the ability for, and openness to, course correction. Activities can involve widespread
 3232 use of social messaging; standardization; establishing voltage standards for electricity
 3233 networks; developing a business model that fits the local context, as with m-PESA in
 3234 Kenya;⁵⁹⁹ or mobilizing finance and organizational capabilities to scale-up manufacturing
 3235 facilities, as has recently been the case with solar photovoltaics.

3236 **Phase 3 – Stabilization of the new and phase out of the old**

3237 In the stabilization phase, innovative practices and technologies become the new normal. All
 3238 the levers and actors work together as innovations become institutionalized, and anchored
 3239 in infrastructure, regulations, user habits, standards and technical capabilities.⁶⁰⁰ It is during
 3240 this phase that technologies and practices are adopted by the remaining late majority and
 3241 laggards.⁶⁰¹

3242 For stabilization to take root, new institutions and infrastructure must be resilient. Unless
 3243 these reforms are institutionalized, the whole process may break down if leaders are unable
 3244 to sustain momentum or leave office. For example, for carbon pricing to have an impact the
 3245 policies would need to be stable. However, such measure can be revoked. In Australia,
 3246 Canada, and France legislation has at different times been repealed as a result of strong
 3247 lobbying and political changes.⁶⁰² Innovations can also fail because of the lack of a long-term
 3248 vision.⁶⁰³ This can be seen, for example, when severe floods lead to fundamental reforms in
 3249 flood management but fail to lead to permanent shifts in land use planning and
 3250 regulations.⁶⁰⁴

3251 Stabilization also requires a complete or partial phase-out of old dominant technologies,
 3252 industries, practices and institutions – for example, restricting or banning carbon-intensive
 3253 technologies, or power stations, or placing controls on smoking.⁶⁰⁵ This can result in intense
 3254 political and economic conflict and struggles, as witnessed for tobacco use, gun control or
 3255 gambling.⁶⁰⁶

3256 As noted earlier, in many countries electric vehicles have reached the acceleration phase,
 3257 but Shenzhen, China, is moving to a stage of stabilization, having built the infrastructure of
 3258 charging stations and initiated a follow-up cycle, with recycling of power batteries.⁶⁰⁷ The
 3259 ability to manage batteries throughout their lifecycle ensures that electric vehicle transport
 3260 remains in the stabilization phase of the S curve for years to come.⁶⁰⁸

3261 *Levers and actors*

3262 *Governance* –Phase-out is likely to accelerate unintended consequences such as job losses or
3263 the decline in regional industries and economies, underscoring the need for a just
3264 transition.⁶⁰⁹ The proposed reforms must be politically feasible. Within electorates, the most
3265 promising allies are the lower middle classes – who have the economic potential to contribute
3266 a meaningful amount of revenue but are also likely to benefit directly.⁶¹⁰

3267 Governments can provide incentives for existing industries and organizations who are
3268 willing to innovate and adapt to the new sustainable alternatives.⁶¹¹ Governments should
3269 support affected workers by providing compensation, through redundancy payments, early-
3270 retirement benefits or social safety nets. Or they can help with skills upgrading, retraining,
3271 alternative employment, and regional innovation or development policies.⁶¹²

3272 This will help reduce resistance, increase public acceptance and ensure a just transition with
3273 fair outcomes for all.⁶¹³ In Germany, for example, policymakers are helping regions that are
3274 suffering from the decline of lignite mining by providing financial compensation, establishing
3275 innovation parks on energy efficiency, and supporting new industries.⁶¹⁴

3276 Similarly, the rapid transition away from coal to natural gas in the Netherlands did away
3277 with 75,000 mining related jobs, affecting more than 200,000 people.⁶¹⁵ What made the
3278 transition successful was that the Government steered it strategically, implementing
3279 countermeasures such as subsidies for new businesses, the relocation of government
3280 industries from the capital to regions of the country hardest-hit by the mine closures,
3281 retraining programmes for miners, and offering shares in the state mining company.⁶¹⁶

3282 *Economy and finance* – A strong tax base will be needed to maintain equilibrium in the
3283 stabilization phase – which will mean countering tax avoidance and abandoning wasteful
3284 incentives and identifying unused tax potential.⁶¹⁷ Options include reducing tax
3285 exemptions,⁶¹⁸ simplifying and unifying value-added tax rates,⁶¹⁹ environmental or carbon
3286 taxes, increasing tax rates on the income and assets of the wealthy,⁶²⁰ increasing property
3287 taxes,⁶²¹ and increasing taxes on tobacco and alcohol.⁶²² Governments can also take
3288 measures to reduce transfer mispricing that enables multinational enterprises to shift
3289 taxable profits to subsidiaries in lower-tax jurisdictions.⁶²³ In low-income countries and
3290 middle-income countries, such options have the potential to increase tax revenue by one to
3291 two per cent of GDP.⁶²⁴

3292 Tax policies need to be well coordinated to avoid adding to the tax burden of the poor
3293 through regressive measures such as sales taxes.⁶²⁵ Any regressive effects can be
3294 counterbalanced through transfers.⁶²⁶ One option is to subsidize the social insurance
3295 contributions of those who cannot afford to pay them fully.⁶²⁷

3296 In low-income countries, private investment can also be stimulated by improving governance
3297 and the business climate, enhancing domestic revenue mobilization, developing domestic
3298 financial markets, and improving economic and financial management.⁶²⁸

3299 *Science and technology* – During the stabilization phase, innovations begin to saturate
3300 markets and achieve widespread dissemination and use, providing a ready-made ‘template’
3301 that can be routinized and optimized with the support of complementary policy settings and

3302 standardisation. Additional measures may be needed to encourage adoption by late
3303 majority and laggard segments of the population, who may only adopt an innovation after it
3304 has been tried and tested by the majority.⁶²⁹ If social, economic or capacity barriers impede
3305 uptake for these groups, additional measures can encourage adoption. For example, many
3306 countries have announced dates to transition to bans on the sale of new fossil-fuelled road
3307 transport vehicles, most progressively by Norway by 2025.⁶³⁰

3308 In this phase, entrepreneurs and established companies can help to scale up sustainable
3309 business offerings as well as to make key technologies, patents, and knowledge available to
3310 others for replication and dissemination.⁶³¹ This will help to phase out older and
3311 unsustainable technologies and practices and enable the spread of innovations and their
3312 adaptation to different contexts. Government interventions and responsible lobbying by
3313 sustainability pioneers together with established companies often play a large and decisive
3314 role in this phase, supporting a managed decline and phase-out of unsustainable
3315 approaches.⁶³²

3316 *Individual and collective action* – Reforms are more likely to succeed if they have strong
3317 public support. For the Montreal Protocol, which stopped the use of chlorofluorocarbons,
3318 discoveries in science and technology were followed by individual and collective action
3319 organized through civil society campaigning and consumer pressure which forced some
3320 companies to remove chlorofluorocarbons (CFCs) even prior to government bans.
3321 Moreover, civil society was engaged assembling a group of engineers to develop a fridge
3322 that used a mix of natural hydrocarbons instead of CFCs – and subsequently founded a
3323 company to design and market these fridges, which ultimately revolutionized the domestic
3324 refrigeration sector, with more than a billion in use today.⁶³³

3325 *Capacity building* – Institutionalization requires different forms of capacity building and
3326 relatively high levels of financial and human resources, for example to invest in legislative
3327 reforms and build new institutions to facilitate implementation, regulation, enforcement
3328 and monitoring. This often requires the allocation of sustainable, long-term financing and
3329 human resources. Capacities are also needed in building resilient and adaptive institutions
3330 and strategies, including strengthening institutions and networks through decentralisation,
3331 increasing diversity and redundancy, and monitoring and continuous learning.

3332 All the phases and levers can be used more effectively by embracing scientific advances and
3333 technological innovation. How policy makers can work more closely with scientists is the
3334 subject of the next chapter.

3335

Chapter 5: Transformations through science—and in science

The scientific method, based on observations and testing hypotheses, can reduce uncertainty, identify tipping points, accelerate the uptake of innovations and lay the foundations for the next frontier of ideas.⁶³⁴ Science also provides the evidence to help dismantle negative pathways or paradigms that counter the rapid acceleration of new technologies and other solutions. While the internet has enabled instant sharing of information, and the prospect of open science, it has also opened the door for malicious actors—and the simply uninformed—to present false information as factual. In the age of multiple compounding global risks that lead to escalating social vulnerability, and increased inequality, the traditional process of production, validation and dissemination of scientific knowledge is not sufficient to result in meaningful processes of change. Transformations to sustainable pathways must be rooted in “socially robust” science. Today more than ever, scientists, policy makers and multiple social actors need to work closely together at the science-policy-society interface to build trust, establish the scientific base for progress towards the SDGs, deliver findings, and communicate these findings to society at large.

Socially robust science plays a central role in advancing human wellbeing across the three phases of the transformation S-curve.⁶³⁵ Scientific evidence can reduce uncertainty and identify tipping points, leading to further knowledge to accelerate and complete each S-curve and provide the foundations for the next one.⁶³⁶ While science does not directly provide general policy solutions, it does provide testable, fundamental knowledge and evidence on which policy should be based.

But how should science itself evolve to be able to respond to multiple challenges? The production of scientific knowledge has to be responsive to the context in which this knowledge is produced and used, which can help to “ensure that scientific knowledge is ‘socially robust’, and that its production is seen by society to be both transparent and participative.”⁶³⁷ Socially robust knowledge has three aspects.⁶³⁸ First, robustness is tested “outside the laboratory, in a world in which social, economic, cultural and political factors shape the products and processes resulting from scientific and technological innovation.” Second, social robustness often involves “an extended group of experts, of real or symbolic users and of real or ‘imagined’ lay persons.” Thus “expertise spreads throughout society and becomes socially distributed expertise.”⁶³⁹ Third, society is not just a recipient of science but effectively an active partner participating in the production of social knowledge. Issue-driven science is common where “facts are uncertain, values in dispute, stakes high, and decisions urgent.”⁶⁴⁰ In such cases, the condition under which science is applied is not ‘normal’ and decisions must be made where scientific inputs are not ‘hard’ but ‘soft.’⁶⁴¹ In this ‘post-normal science, extended peer communities can play a role in maintaining the quality and verification of knowledge.’⁶⁴²

The process of production and validation of scientific knowledge itself needs to evolve in order to produce socially robust knowledge. Broader engagement of society through all aspects of this process in a dynamic and iterative manner, i.e., a greater democratization of knowledge and movement towards a regime of pluralistic expertise, is key to science that is cognizant of, and responsive to, societal needs.

3379 The importance of science has been asserted in a series of global conferences. In 1972, the
 3380 United Nations Conference on the Human Environment in Stockholm, declared, “Science
 3381 and technology, as part of their contribution to economic and social development, must be
 3382 applied to the identification, avoidance and control of environmental risks and the solution
 3383 of environmental problems and for the common good of mankind.”⁶⁴³ The report
 3384 recognized the value of using science and evidence to address what came to be called
 3385 ‘wicked’ problems – that have no clear formulations or definitive solutions.⁶⁴⁴

3386 In 1992, the Earth Summit in Rio asserted that “One role of the sciences should be to
 3387 provide information to better enable formulation and selection of environment and
 3388 development policies in the decision-making process.”⁶⁴⁵ And in 2012 in the outcome
 3389 document of the subsequent Rio Conference, “The Future We Want,” governments again
 3390 called for strengthening the science-policy interface.⁶⁴⁶ Specifically, they mandated the
 3391 production of a *Global Sustainable Development Report* (GSDR), of which this current report
 3392 is the latest. In these reports science is defined broadly to include natural and social
 3393 sciences, the humanities, and knowledge generated from local and indigenous communities
 3394 (Box 5-1).

Box 5-1: Indigenous and local knowledge research infrastructure

Indigenous and local knowledge, acquired through lived experience about a region or environment goes beyond conventional scientific studies to incorporate a cultural element. The UN’s Common Agenda recognizes the importance of meaningful participation in public affairs by groups traditionally marginalized,⁶⁴⁷ but their full recognition and participation is not yet realized.

African indigenous scientific and technological innovations were routinely ignored during and after colonialism, as has been the contribution of technological innovations of enslaved Africans in America. Recent examples of fusion of technology with Indigenous and local knowledge in Africa demonstrate the creative, technological, and scientific intellectual agents emerging from the continent. African Science Technology and Innovation is emerging from a long process of multicultural knowledge production.⁶⁴⁸

Capturing and sharing information within and among indigenous groups is complex, but the Indigenous Knowledge Research Infrastructure (IKRI) is an example of success in this regard. The IKRI focuses on food systems, aiming to preserve indigenous knowledge, supporting input for policy makers, data creation and linkages with other data repositories. This should help protect and exchange indigenous knowledge and strengthen indigenous peoples’ livelihoods globally.⁶⁴⁹

Local and indigenous knowledge in rural development and its contribution to food security can help in achieving SDGs. The Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP) is a regional, intergovernmental organization aimed at galvanizing and organizing knowledge for rural development in general, and creating best practices for integrated rural development policies.⁶⁵⁰

Local and indigenous knowledge is fundamental to address climate change and loss of biodiversity. Indigenous communities depend on local biodiversity and ecosystems and are especially vulnerable to climate change impacts. Indeed, Indigenous communities are custodians of many of the world’s most fragile and important ecosystems. They possess environmental knowledge that is crucial to developing effective adaptation plans. Across the world, indigenous peoples already manage many water-related risks in a changing climate with traditional knowledge and solutions. They also have a human right to be involved in the decision-making process for issues that affect them.⁶⁵¹ The World Intellectual Property Organization (WIPO) has therefore identified the need to engage Indigenous communities in the elaboration of climate action plans.⁶⁵² When engaging with local and indigenous knowledge, it is crucial to follow the principle of free, prior and informed consent (FPIC), which entails culturally appropriate consultation. Traditional knowledge which can be of archaeological and scientific value is the intellectual property of indigenous communities, who have the right

3426 to negotiate the conditions of use of this information and withhold consent at any stage.⁶⁵³ Enforcing a
3427 “permission to share” dialogue helps support indigenous self-governance and autonomy.

3428 Over 100 countries have signed onto the UN sponsored commitment to FPIC but many jurisdictions are failing
3429 to implement it. As part of the FPIC process some countries do have programs and departments to support the
3430 protection and use of indigenous knowledge as intellectual property. These include Canada’s Intellectual
3431 Property Strategy, Australia’s Indigenous Knowledge IP Hub, and The Intellectual Property Office of the
3432 Philippines. However few countries have incorporated the protection of traditional knowledge into their
3433 laws.⁶⁵⁴

3434 The 2019 GSDR asserted that “science lies at the heart of sustainable development”, and
3435 offered recommendations for mobilizing knowledge communities, promoting access to
3436 science and data especially in low-income countries, investing in mission-oriented research,
3437 and scaling-up technology transfer.⁶⁵⁵ This current chapter builds on that Report and
3438 explores new relationships and equilibriums – based on science that is multidisciplinary,
3439 equitably and inclusively produced, openly shared, widely trusted and embraced, and
3440 “socially robust”—relevant to society.

3441 The science for the transformations needed to achieve the 2030 Agenda has been available
3442 for some time. The question now is how society – including scientists – can speak more
3443 convincingly to governments to inspire bold and often difficult decisions and to encourage
3444 behaviour change, in order to use the power of science and technology as an effective lever
3445 for starting, accelerating and stabilizing transformation.

3446 **A multidisciplinary approach to multiple crises**

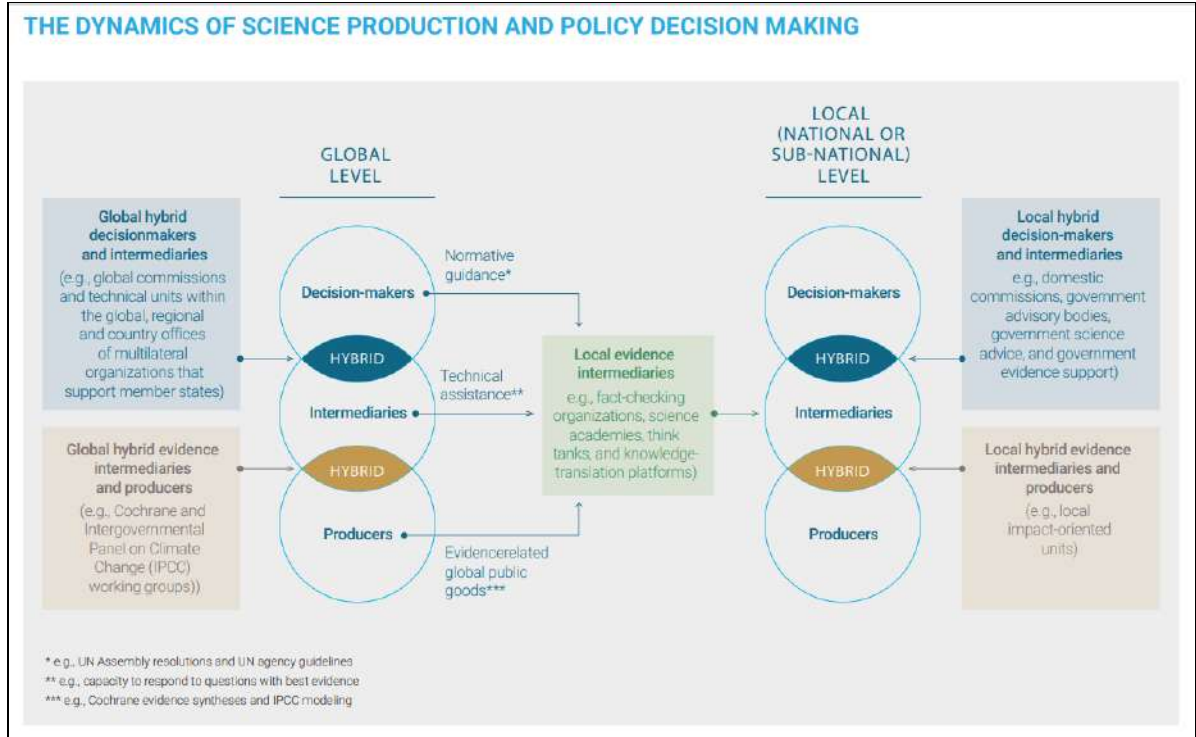
3447 A few decades ago, the “science-policy interface,” or points of interaction between scientific
3448 knowledge and the policy-making process, primarily involved experts in individual scientific
3449 disciplines – usually from high-income countries, who were predominantly white males in
3450 mid- to late-career. These individuals spoke to career policymakers, demographically similar
3451 people working in government, economics, and law. This interface was constructed as a
3452 four-stage policy formulation cycle: agenda-setting, policy formulation, implementation, and
3453 review. Within this largely linear sequence, policy makers expressed their priorities to the
3454 science community who responded with factual information and advice.⁶⁵⁶ Eventually an
3455 “epistemic community”, which is “a network of professionals with recognised expertise and
3456 competence in a particular domain and an authoritative claim to policy relevant knowledge within
3457 that domain or issue-area”, is formed and drives action for problem-solving.⁶⁵⁷ These
3458 communities include experts from various disciplines, from policy and public administration,
3459 and other relevant practitioners which jointly engage in problem-solving knowledge
3460 production.

3461 For achieving sustainable development in the 21st Century, however, epistemic communities
3462 need to reflect the diversity of society, and their interactions will need to be far more multi-
3463 directional and multi-disciplinary, so they can effectively address complex and interlinked
3464 challenges and goals. Using the rate of change in Gross Domestic Product (GDP) to measure
3465 economic performance is an example of a product generated by a linear model of science-
3466 policy interface which isolates economic activity from its interlinkages with nature, culture,
3467 gender, power relations and the social fabric. Thus, meaningful measurements of progress
3468 on sustainable development are required to incorporate a wide range of issues and
3469 disciplines in a simple and integrated manner (see box 3-11).

Effective science advice mechanisms will be needed for evidence-based policymaking. Chief scientific advisors, have been appointed in some countries. These mechanisms can be effective, but need to be established in ways that work within specific cultures, while also questioning established institutional traditions so as to open new avenues for transformation. Most methodologies and strategies in the science advice community use cultural approaches closely related to their roots in English-speaking countries. The relationship between culture, language, on the delivery of effective, locally applicable scientific advice warrants further research.⁶⁵⁸ To that end, the International Network of Governmental Science Advisors (INGSA) will aim to gather evidence on how culture and language should be taken into account to ensure the most effective delivery and uptake of scientific advice. An inclusive model of ‘science-policy-society interface’ is required (Figure 5-1).⁶⁵⁹ The interface has to manage the challenges of transdisciplinarity in order to effectively include non-academic stakeholders in the process of knowledge production⁶⁶⁰ for example in the Future Earth program.⁶⁶¹

The international community has created platforms through which scientists, policymakers, and knowledge brokers can interact and capitalize on the latest information. These include the Montreal Protocol for the ozone layer (1987), the Intergovernmental Panel on Climate Change (IPCC) (1988), and the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES) (2012).⁶⁶²

Figure 5-1: Science production and decision-making



Source: Adapted from Global Commission on Evidence to Address Societal Challenges, 2022.⁶⁶³

These global platforms are complemented by a wide range of other knowledge intermediaries, including universities, think-tanks, and indigenous and local communities (Box 5-2). The International Network of Governmental Science Advisors (INGSA), with its African, Asian, Latin American and Caribbean chapters is a large and growing network of

government science advisers with a mission to strengthen science-policy interfaces at all levels of governance.⁶⁶⁴ The network brings together policy practitioners, researchers, and other experts to promote the use of evidence in decision-making, to provide capacity building, and to generate knowledge for strengthening science-policy interfaces. The findings and recommendations of these platforms can be communicated to the broader public through knowledge brokers, knowledge translators, the media, science editors, and fact-checkers.⁶⁶⁵

As society faces complex and urgent challenges requiring the full involvement of all parts of society, it is clear that the current platforms and intermediaries are not sufficient. While children, young people, NGOs and CSOs are starting to be included in global processes and platforms, they are still often excluded from the actual decision making. Children and young women and men, those who have the biggest stake in the future, are particularly compelling messengers and leaders; these groups should be further empowered to participate in policy-making and decision-making to implement the SDGs. Civil society organizations (CSOs), non-governmental organizations (NGOs), think tanks and other institutions funded by public and/or private sources or philanthropy, that specialize in specific sectors, such as education, health, or climate change may be more effective at engaging the public; they can be powerful advocates for change.

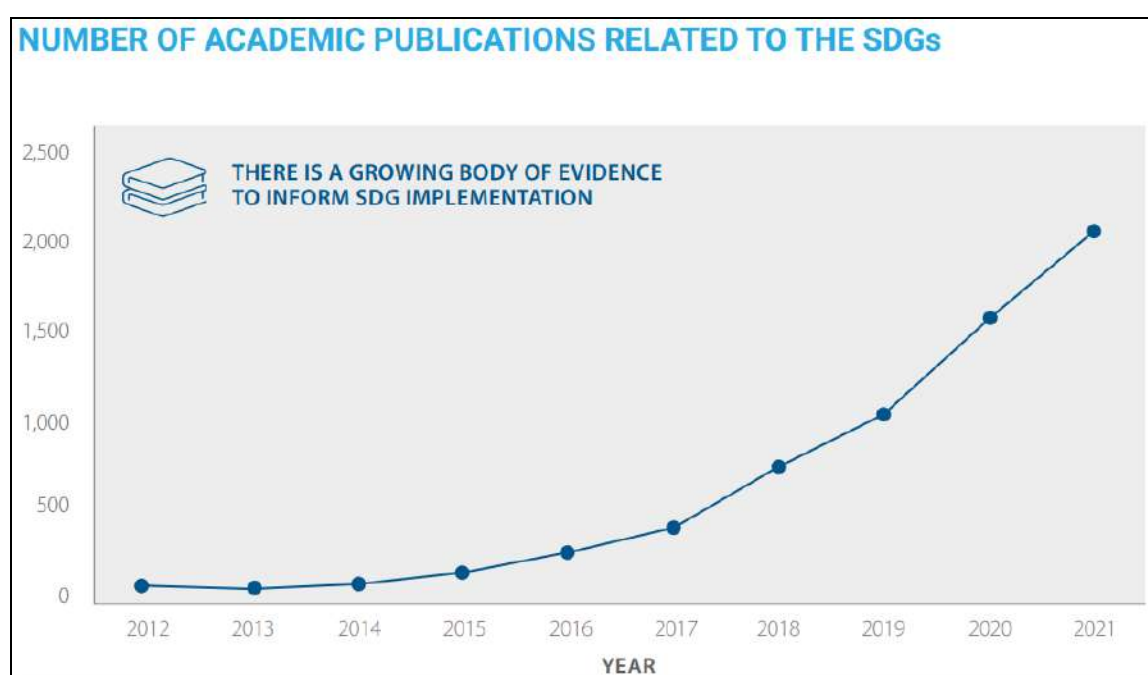
Box 5-2: The science-policy-society interface in Africa operates through an ecosystem of institutions

- *INASP* – An international development organization with 30 years' experience of working with a global network of partners in Africa, Latin America and Asia.⁶⁶⁶
- *Southern Voice* – An open platform for think-tanks focusing on SDGs and disseminating evidence-based policy analysis by researchers from the Global South.⁶⁶⁷
- *The African Population and Health Research Centre* – Which focuses on population and health.⁶⁶⁸
- *The African Centre for Evidence* – At the University of Johannesburg focuses on the SDGs.⁶⁶⁹
- *The Centre for Rapid Evidence Synthesis (ACRES)* – At the University of Makerere aims to support policy and decision-making with high quality, relevant and timely evidence.⁶⁷⁰
- *The African Institute for Development Policy (AFIDEP)* – A pan-African Institute with a mission to institutionalize the use of evidence among government decision-makers for sustainable development.⁶⁷¹
- *AKADEMIYA2063* – Provides policy research and capacity strengthening support for the implementation of the Comprehensive Africa Agriculture Development Programme of the African Union.⁶⁷²
- *Code For Africa* – A citizen-based initiative focused on civic technology and data journalism.⁶⁷³

Shining a brighter spotlight on the SDGs

The 2030 Agenda and its 17 SDGs approach sustainable development in a holistic, integrated manner. An integrated approach is the only way to stem the compounding risks of climate change, disaster, pollution, biodiversity loss and degraded ecosystems as well as their socioeconomic impacts. Those compounding risks have amplified social systemic risks, war, security, inequality, financial instability and erosion of democracy. The synchronicity of risks can and has motivated researchers, funders and academic institutions to increasingly frame their research, teaching and societal outreach strategies around the SDGs; they prioritize transdisciplinary research, co-creation, and mission-oriented science, as with initiatives by the Sustainable Development Solutions Network, the International Science Council, and UNESCO.⁶⁷⁴ This is also reflected by many more publications which mention the SDGs (Figure 5-2), a trend which continues an upwards trajectory.

Figure 5-2: Number of academic publications including "SDG"



Source: as reported in Scopus 2012-2021.

This work has also generated science-based SDG tools – such as evidence databases, data and monitoring frameworks, methods for assessing SDG interlinkages, and models and scenarios for developing transformation pathways. In addition, there are curated knowledge repositories on interventions to achieve the SDGs (Box 5-3), as well as academic and professional training courses.⁶⁷⁵ As shown in Chapter Two, attaining the SDGs requires working across the 2030 Agenda to maximize positive interlinkages and committing to partnerships across all sectors, including academic partnerships and engagement with students, women, children and youth.

As knowledge of and interest in the SDGs has grown, so has the availability of tools and methods for integrated SDG analysis and decision support. Box 5-3 gives examples of such tools and their applications. These tools should be accessible and relevant to policy makers and other practitioners so they can systematically identify and evaluate positive and negative interlinkages among SDGs, and strategically inform their decision-making process.

Box 5-3: Research evidence for the SDGs

The scientific community provides platforms, tools and methods for integrated analysis of the SDGs. Many are specifically designed to support decision-making. Examples include:

Social Systems Evidence – Developed by McMaster University Forum+ and Monash Sustainable Development Institute. This is a comprehensive and continuously updated repository of syntheses of research evidence on each SDG. For example, policy makers can find syntheses of studies of effects of training programmes on African smallholder farmers' economic outcomes and food security (SDG 2) or the effects of payment for environmental services (PES) schemes on deforestation and poverty in LMICs.⁶⁷⁶

SDG Synergies – This is a free online tool to facilitate strategic decision-making based on systems analysis. It can be used to align different policy strategies. The tool is centred around a participatory scoring process, where interlinkages between pairs of SDGs are assessed and guided by the question: If progress is made on

3569 SDG X, how does this influence progress on SDG Y? SDG Synergies has been used to support integrated SDG
 3570 implementation in Mongolia, Sri Lanka, and the European Union.⁶⁷⁷

3571 *Enabling SDGs* – A free online tool for mapping, visualizing, and analysing how SDG targets influence each
 3572 other in specific contexts. The output is a cross-impact matrix, presenting the interlinkages of interest and
 3573 highlighting key synergies and critical trade-offs.⁶⁷⁸

3574 *SDG Interlinkages Analysis & Visualization Tool* – A free online tool available since 2015. The user may select
 3575 countries, goals, and targets of interest and thereafter visualize the main interlinkages. The visualization of
 3576 interlinkages is based on scientific literature and available indicator data. The user may edit the interlinkages
 3577 and explore and download data.⁶⁷⁹

3578 *The iSDG model* – The Integrated Sustainable Development Goals (iSDG) model is designed to support strategic
 3579 planning and analyse the impacts of policy interventions. The model accounts for the dynamic interactions
 3580 between all SDGs and shows the best pathways for implementation. The iSDG model has been used to support
 3581 decision-making in several countries, including Nigeria, Australia, and Senegal.⁶⁸⁰

3582 *SDG Climate Action Nexus* – A free online tool for policy makers across departments and at different levels of
 3583 government. Specifically, it provides an understanding of trade-offs and synergies between climate action and
 3584 SDG targets. Examples of use include analysis of the links between NDCs and SDGs in Macedonia, Lebanon, and
 3585 Georgia.⁶⁸¹

3586 *NDC-SDG Connections* – Presents knowledge and illustrates connections between the SDGs and Paris
 3587 Agreement. The tool is free to use and allows the user to make global and regional comparisons. It was
 3588 developed to identify entry points for coherent climate and development policies.⁶⁸²

3589 More tools and methods for coherent implementation of the SDGs are available on the UNDP integration
 3590 platform.⁶⁸³

3591 **The science-policy-society interface must be inclusive**

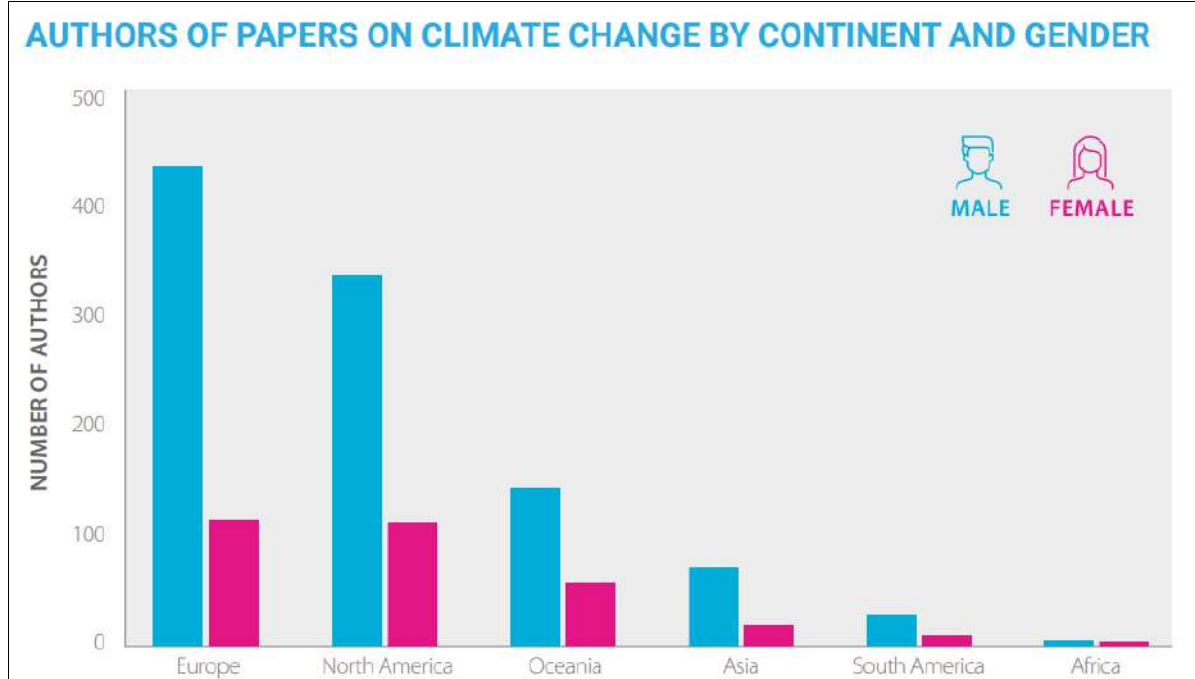
3592 The SDGs require a transdisciplinary approach incorporating the humanities, general social
 3593 sciences, natural sciences, indigenous knowledge, and the arts. Research questions and
 3594 initiatives related to the SDGs should be co-created with a range of actors, including
 3595 children, young people, local communities, civil society, and academics from across various
 3596 disciplines. Importantly, scientists and policy makers themselves must be diverse, in terms
 3597 of gender, age, demographic group and ethnic and geographical diversity, for meaningful
 3598 change. Philanthropies, often the generous sponsors of targeted interventions—in health,
 3599 or education, or environmental protection, for instance—could expand their portfolios to
 3600 support holistic and transdisciplinary research. As noted above, academic institutions can
 3601 also support this by rewarding practitioner-scholars.

3602 A particular concern is gender disparities in science and research. Although in middle- and
 3603 high-income countries girls outperform boys in science in secondary school in all subjects,
 3604 only one-third of the world's scientific researchers are women—though the pattern varies
 3605 between global regions.⁶⁸⁴ Women are notably underrepresented in engineering,
 3606 manufacturing, construction, and information and communication technology programmes;
 3607 in over two-thirds of countries, the percentage of females studying engineering,
 3608 manufacturing and construction or ICT is below 25 per cent.⁶⁸⁵ These disparities play out in
 3609 the degree to which science addresses areas of concern for women—for example,
 3610 investment in research on women's health issues lags significantly behind spending on
 3611 men's health concerns.⁶⁸⁶

In 2021, the website Carbon Brief analysed the gender and affiliation country of the authors of 100 highly cited climate-science papers from the previous five years (Figure 5-3).⁶⁸⁷ In addition to confirming gaps in publication productivity between the high-income countries and the low- and middle-income countries, this study highlighted wide gender disparities. Less than one-quarter of the authors were female, and only 12 of the 100 papers had women listed as the first author.⁶⁸⁸ Similar gender disparities have been observed in other disciplines, reflecting the obstacles that women continue to face in establishing the networks and affiliations needed to lead research projects.⁶⁸⁹

Addressing the gender imbalance in scholarship and scientific research, and increasing inclusive research more broadly, could bring new perspectives and insights into science.⁶⁹⁰ Scaling up co-created research, especially, could ensure that the findings and messages of this research resonate across society in more meaningful and durable ways, which could help to inspire commitment to the kinds of transformations we need.

Figure 5-3: Authors of papers on climate change by continent and gender



Note: The number of male (purple) and female (orange) authors in the Top 100 most-cited climate science papers during 2016-20. Source: Carbon Brief, 2021

Global imbalance in research and development

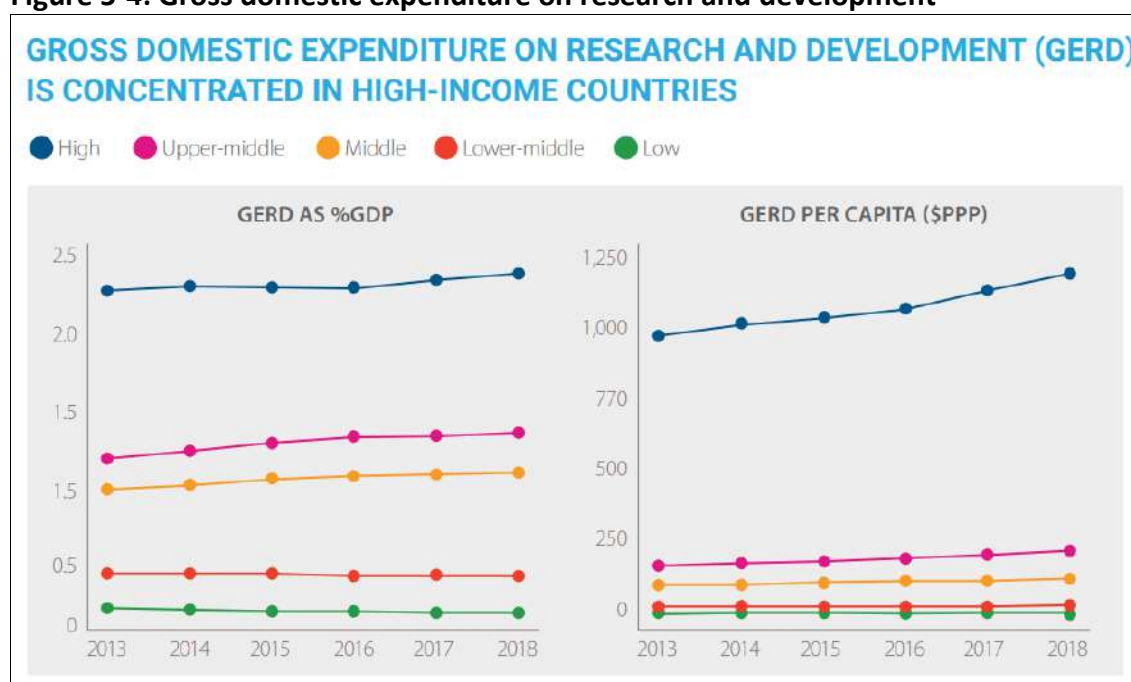
Between 2013 and 2018, the average gross domestic expenditure on research and development (GERD) as a percentage of the GDP was twice as high in high-income countries than in upper-middle- and middle-income countries, and six times higher than in lower middle- and low-income countries (figure 5-4).⁶⁹¹ On a per capita basis, GERD in high-income countries was seven times that of upper-middle- and middle-income countries, and sixty-five times that of lower middle- and low-income countries. Ten countries account for 80 per cent of spending.⁶⁹² Over the period from 2013 to 2018, GERD as a percentage of GDP decreased in low and lower-middle income countries.⁶⁹³ As a result, more than 70 per cent of the world's population are served by relatively small research and development

(R&D) systems.⁶⁹⁴ This has implications for developing solutions that can advance context-specific SDG implementation in low- and middle-income countries. This also means that countries in the Global South may lack the capacity to absorb or adapt technological advances developed elsewhere. Consider the pay-off for earning a PhD and then setting up research facilities in a low-income country vis a vis research facilities and access to funding in high-income countries; investments and opportunities for research and capacity-building are generally fewer than in high-income countries.

This imbalance severely curtails the capacity of many low- and middle-income countries to embrace the required transformations that are essential to attaining the SDGs through (a) participating in the international platforms which bring together scientists, policymakers and knowledge brokers to solve wicked problems, and (b) using the science and technology lever effectively in the various stages of the transformation process towards sustainability to generate context-specific solutions in their region and their national territories.

In addition, the largest research funding share comes from the private sector. In 2020, in the United States, for example, \$517.4 billion in research investment came from the private sector, \$142.8 from the public sector, \$22.6 billion from higher education, and \$25.1 billion from non-profit organizations.⁶⁹⁵

Figure 5-4: Gross domestic expenditure on research and development



Source: UNESCO Institute of Statistics 2023b

An unbalanced global science system does not serve the needs and interests of the whole planet. For some subjects, scientists fail to take local conditions into account and miss some important subjects. For COVID-19, for instance, most of the research has taken place in a limited number of countries, so there remain many unknowns about the virus, including the reasons for the lower-than expected mortality rates due to COVID-19 in parts of Africa.

There have been severe inequalities around vaccine production and distribution, such that high-income countries had the first access to vaccines and were administering boosters

before residents of other countries had received first or second doses.⁶⁹⁶ In addition, COVID-19 has exacerbated inequities in R&D funding. Donors have used some overseas development assistance R&D funds for work on COVID-19 while other research activities have slipped.⁶⁹⁷ In a global pandemic, the large public research funders of the world would be expected to direct resources towards strengthening R&D capacities in low-income countries, too, and not leave this to development cooperation where resources are already stretched.

In some cases, research and knowledge production is not happening due to a lack of capacity or other structural inequalities. In other cases, there is actually a thriving knowledge ecosystem, whether in a Global South country or among people in vulnerable situations. Local and Indigenous communities can be deep wells of sustainable development expertise which policy makers need to incorporate into decision-making. In addition, even in areas where the Global North dominates in terms of technological innovation and research, countries in the Global South may be at the forefront in applying this technology—such as in renewable energy technologies, battery production and electric vehicles.⁶⁹⁸ SDG implementation across the world will benefit from capacity building in the Global South through knowledge-sharing between South and North, as well as South-South collaborations, based on equity and mutual respect.⁶⁹⁹

Sharing knowledge openly and equitably

While making the production of science more inclusive and geographically diverse, it is also crucial to ensure that once science is produced, it is widely accessible. The open science movement maintains that public interest groups, policymakers, industry and teachers should have access to all underlying scientific research including publications, data and software (Box 5-4).⁷⁰⁰ Research outputs, including metadata, should be freely accessible with no borders – geographical, temporal, social or cultural. This would serve to augment and expand the utilization of science towards the attainment of the SDGs.⁷⁰¹ This is especially important for SDG issues, and for scientific research that has been publicly funded and which should be treated as a public good.

A shift to open science can change how research is done, who is involved, and how it is valued.⁷⁰² This should be understood as part of a broader relationship between science and society – mobilizing knowledge to influence public policy, the education system and public understanding.⁷⁰³

Open science can boost global research collaboration.⁷⁰⁴ It enables scientists and others to use resources more effectively, and boost rigour and reliability by sharing data and code and by using open tools.⁷⁰⁵ And, by enabling contributions from many fields, it can open new questions and areas of inquiry. It can also broaden research participation, for example, by offering opportunities to citizen scientists.

In some cases, private sector companies are embracing so-called “open innovation,” in which industry teams collaborate with outside researchers and communities to address common, well-articulated problems. Though of course this new openness is balanced with the interest in protecting intellectual property and revenues, it nonetheless represents a promising trend for inclusive knowledge production that could benefit SDG implementation.⁷⁰⁶

Crucial to open science are publicly accessible databases. In the humanities, for example, the digitization of historical documents across continents has allowed students and citizens to gain first-hand understanding of key moments in history that can be instructive for current challenges.⁷⁰⁷ In the physical sciences, open data and collaboration in astrophysics are being used to explore the origins of our universe. And the development of drugs and vaccines have been sped up by public genomics repositories such as GenBank – though it should be noted that less than two per cent of the human genomes analysed so far have been from Africa, even though that continent has the greatest genetic diversity.⁷⁰⁸

While open access publishing is on the rise,⁷⁰⁹ only a minority of publications offer open access, and some charge authors an article processing fee, both of which limit opportunities for many youth and lower-income groups. Even on the internet, much essential information is behind paywalls in academic journals that require subscriptions. A survey by the scientific publisher Springer Nature found that approximately 40 per cent of readers of its websites were non-academic, but around half of all surveyed users said they were unable to access the full text of subscription content.⁷¹⁰ The same survey looking at documents related to at least one SDG were four times more likely to be downloaded if they were published under an open licence and thus available to anyone.⁷¹¹

UNESCO has developed a framework for open science that can help to guide further action in this direction (Box 5-4).

Box 5-4: UNESCO framework for open science

In November 2021, UNESCO made seven recommendations for action on open science.⁷¹²

1. A common understanding of open science.
2. Developing an enabling policy environment for open science.
3. Investing in relevant open science infrastructure and services.
4. Investing in human resources, training, digital literacy and capacity building for open science.
5. Fostering a culture for open science and aligning incentives to the practice.
6. Promoting innovative approaches for open science at different stages of the scientific process.
7. Promoting international and multi-stakeholder cooperation in the context of open science, with a view to reducing digital, technological and knowledge gaps

Member States are requested to: 1) develop appropriate monitoring frameworks; 2) share examples of good practices; and 3) develop long-term strategies for efficient open science. This will serve to strengthen the nexus between science, policy and society and increase transparency and accountability for inclusive and equitable solutions.

Founded in 2017 in Australia, the Curtin Open Knowledge Initiative collaborates with national and international partners to create fresh insights into open and global knowledge practices and measure the global status and impact of scholarly communication, open access, diversity and inclusion.⁷¹³ It shows the number and percentage of accessible outputs by region, subregion, number of publications, and open access levels. Although the initiative itself eschews rankings, it is noticeable that the top 27 countries for openness in access are low- and middle-income countries – until the appearance of Greenland in 28th position.⁷¹⁴

3752 Trust and Integrity

3753 As the global community pushes for greater access to knowledge, it also has a responsibility
3754 to ensure that information is broadcast with integrity and responsibility. To this effect, the
3755 UN Secretary General, in his report '*Our Common Agenda*' suggests that "States, media
3756 outlets and regulatory bodies should explore a global code of conduct that promotes
3757 integrity in public information, facilitated by the United Nations".⁷¹⁵ He further urges that it
3758 is time to better manage and regulate the digital commons as a global public good.

3759 A major hurdle for science is the speed of publication, especially relative to other sources of
3760 knowledge including journalism and social media. Producing unbiased, peer-reviewed
3761 information absorbs time and money, giving alternative outlets or false facts time to get a
3762 head start. To help scientific health evidence keep pace with fake news for COVID-19 for
3763 instance, WHO developed a social listening tool called Early AI-supported Response with
3764 Social Listening (EARS). It offers real time information about how people are talking online
3765 about the pandemic.⁷¹⁶ WHO also released a series of tips to identify mis- and dis-
3766 information and is working with digital companies and social media platforms to ensure that
3767 when people search for COVID-19 related information, the first results to appear are
3768 science-based resources from official sources.⁷¹⁷

3769 Academic journals can also contribute to the science-policy-society interface by
3770 communicating scientific findings in a manner that is accessible and engaging to policy
3771 makers and the broader public. Frontiers Policy Labs, for example, is a publication that
3772 stresses the importance of science being open, trusted, and accessible. The initiative has
3773 launched a series of conversations to engage experts with policy leaders⁷¹⁸ and has
3774 produced a number of science communication training programmes.⁷¹⁹

3775 The world has responded to the proliferation of fake news with comprehensive
3776 countermeasures. In June 2022, Duke University's Reporter's Lab estimated that 400 teams
3777 of journalists and researchers in 105 countries were working on tackling political lies, hoaxes
3778 and other forms of misinformation.⁷²⁰

3779 ● *Africa* – "Africa Check" is an independent, non-partisan organisation with teams in
3780 South Africa, Kenya, Nigeria and Senegal, which assesses claims made in the public
3781 arena using journalistic skills as well as sources drawn from online tools, public
3782 sources, and experts. Another network is "Africa Facts" specifically targeting Covid-
3783 19 with its #KeepTheFactsGoing programme.⁷²¹

3784 ● *United States* – The Poynter Institute is home to the International Fact-Checking
3785 Network, which promotes excellence in fact-checking with more than 100
3786 organizations worldwide through advocacy, training and global events.⁷²²

3787 ● *Canada* – The 'Check then Share' campaign reminds people to fact-check
3788 information before sharing it on social media, while providing shareable images and
3789 videos.⁷²³

3790 ● *Latin America* – The Comprova consortium, led by the Brazilian Association of
3791 Investigative Journalism; a neutral and non-profit fact checking
3792 organization, Chequeado, in Argentina; Verificado Uruguay consisting of 137 entities,

3793 and the Verificado consortium in Mexico, with more than 90 partners, are all
3794 working to ensure truth in journalism.⁷²⁴

3795 These fact-checking initiatives face an uphill battle. The speed and ease with which
3796 information travels has helped the democratization of knowledge, and amplified voices and
3797 perspectives that may have been ignored in the past. However, it also introduces new risks.
3798 Social media has made the delivery of information extremely fragmented and complex, now
3799 that anyone can produce and transmit news.⁷²⁵ Influencers and propagandists, with little or
3800 no expertise in the issue at hand, can create seemingly compelling stories with catchy
3801 headlines that appear factual and elicit a strong emotional response.

3802 The algorithms that structure an individual's social media experience ensure that people
3803 rarely see posts that contradict their expressed biases and preferences. Almost any post
3804 that appears to have a scientific basis can go viral, soliciting the trust of millions of people,
3805 especially if it aligns with their existing views. Moreover, the sources of disinformation are
3806 often obscured, which can trick search engines into presenting them as credible news sites.

3807 This “echo chamber” effect created by social media is having a profound impact on the
3808 political landscape in many countries, with increased polarization and partisanship and a
3809 lower level of trust in governments.⁷²⁶ It can also stoke distrust in science. Scientists have
3810 always relied on peer-reviewed journals and other publications to check the veracity of data
3811 and information. Information without a scientific basis may be distorted or fake – either
3812 malicious or mendacious -- designed to confuse or mislead. A recent survey of 140,000
3813 people in more than 140 countries found that only 54 per cent of people had a ‘medium’
3814 level of trust in scientists, and only 18 per cent had a high level. More than one-third of
3815 people in southern Africa and Latin America said science helps ‘very few’ people in their
3816 country.⁷²⁷

3817 Two vital issues today illustrate the extent of distrust of science: climate change and Covid-
3818 19 vaccinations. In both cases, the science is clear and compelling, yet sizable minorities of
3819 people express doubt. In climate change, the degree of trust varies widely from region to
3820 region, with nearly 75 per cent of respondents in South Asia reporting that they trusted
3821 climate scientists ‘a great deal’ or ‘a lot’, while in Western Europe, East Asia, Eastern
3822 Europe, and North America the proportion was around 50 per cent.⁷²⁸ On the COVID-19
3823 vaccine, an overabundance of often inaccurate information stoked mistrust in the
3824 government and science,⁷²⁹ and resulted in public resistance or hesitancy about vaccines
3825 and other health measures. A recent study of 23,000 people across 23 countries found that
3826 nearly 25 per cent of respondents reported ‘vaccine hesitancy’.⁷³⁰

3827 **Socially robust science can bridge the gap between policy commitment and policy** 3828 **implementation**

3829 Ensuring a strong and effective science-policy-society interface does not automatically
3830 ensure transformation towards the SDGs. There is inevitably a time lag between the
3831 publication of scientific evidence, public policy decisions, and full implementation.
3832 Sometimes, the gap between policy articulation and action is created by political inertia
3833 resulting from a lack of political will or lobbying and disinformation by vested economic
3834 interest groups. For example, the damage to health from adding lead to fuel was identified
3835 by science in the 1920s but the practice only stopped completely in 2021. Similarly, though

3836 science has long established a clear link between smoking and cancer, policy guidance
3837 against smoking has taken a long time.⁷³¹

3838 Government pronouncements on the SDGs are generally sincere, but progress is limited by a
3839 lack of capacity, data limitations, existing trade-offs between goals and policies, incomplete
3840 understanding of economic or ecological processes, or by worry that a given action may be
3841 unsuccessful. Progress may also be limited by the relatively short political cycles of
3842 governments, with long-term sustainable development solutions taking a ‘back-seat’ to
3843 short-term and less ambitious measures that are more popular with the electorate. For
3844 example, investments in early childhood care and development (ECCD) reap multiple
3845 benefits for societies but their effects are often not seen for many years. The financial
3846 investment in ECCD may not be considered an important “election issue” as a result.⁷³² In
3847 some cases, the problems are so complex that even the formal scientific method based on
3848 testing hypotheses does not always capture the reality of the problem; increments in
3849 knowledge do not necessarily reduce uncertainty.⁷³³

3850 For many countries, action for the SDGs can be impossible because of political unrest and
3851 conflict and/or natural disasters. The scientific evidence may be clear, but the way that it
3852 informs policy is influenced by political and economic interests, and even stages in the
3853 election cycles. Even when the weight of scientific evidence may be overwhelming, the
3854 necessary actions are fraught with political and technical complexities—as is the case when
3855 a well-developed global process such as IPCC has not resulted in full-scale transformation.
3856 Despite the overwhelming scientific evidence that demonstrates the immense risks of
3857 maintaining the current status quo, we have not fully addressed the global carbon footprint.
3858 We are not on track to stay “Below 1.5 C”.

3859 In order to be meaningful, science needs to be “socially robust,” or relevant to society. This
3860 means that science must be transparent, inclusive, and transdisciplinary – produced in
3861 diverse contexts by a heterogeneous and multidisciplinary groups engaging all possible
3862 actors including youth. The nature of achieving the SDGs embodies a broader engagement
3863 of society with all aspects of science and a greater democratization of knowledge so that
3864 people will be ready and willing to commit to the transformations we all need.
3865

Chapter 6: Calls to action for transformation

Against the backdrop of the changes and shocks of the last few years, the 2030 Agenda for Sustainable Development remains a strong and valid agenda for a desirable future – for people, planet, prosperity, peace, and partnership. This report points to the science-driven transformations urgently needed to enable progress toward the SDGs.

At the halfway point of the 2030 Agenda, marked by major setbacks experienced by humanity and the planet, all countries must renew their efforts to enable transformations towards the SDGs. This means identifying key interventions that have systemic effects across the SDGs, scaling up investment, mobilising the knowledge of scientists, practitioners and communities at all levels, and building the capacity needed in all countries and institutions, all while enhancing policy learning and accountability and closely monitoring the impacts of interventions.

There is evidence that goals and targets matter in themselves. But experience in the last eight years has also shown that implementation and compliance are still weak. Today, halfway to 2030, collective action towards sustainable development becomes one of the most important levers, if not the most important, to actively embrace and meaningfully engage with transformations. Using this lever effectively requires ambitious public policies to establish adequate incentives for change, consultation with a wide range of stakeholders and coalition building.

Equally important for the 2030 Agenda is to step up international cooperation for the poorest and most vulnerable countries – to help them recover from the pandemic, as well as from ongoing conflicts, inflation and the cost-of-living crisis and to build resilience to future shocks and climate risks. In the 21st Century, global solidarity and international cooperation are instrumental to human security and to building an inclusive, equitable and peaceful world.

Fully achieving all SDGs and targets in the remaining seven years will be difficult, but every inch of progress matters. And this must be achieved globally – leaving no country, society or person behind.

Incremental and fragmented change is not sufficient and will not achieve the transformations that are required. The only way forward is to transform how we think, live, produce and consume in order to achieve a new equilibrium that balances resilience, security and well-being, and does so in harmony with nature. There are efforts to develop measurements of progress on sustainable development that complement Gross Domestic Product, but they should be further enhanced on the basis of socially robust science.

As indicated in the 2019 *Global Sustainable Development Report*, the SDGs and their targets can be approached through six entry-points: (i) human well-being and capabilities, (ii) sustainable and just economies, (iii) food systems and nutrition patterns, (iv) energy decarbonization with universal access, (v) urban and peri-urban development, and (vi) the global environmental commons. These entry points offer opportunities for social and technological innovation and changes in human behaviour that lead to transformative pathways.

3907 The previous GSDR also identified four main levers that need to be deployed in these entry-
3908 points – governance, economy and finance, individual and collective action, and science and
3909 technology. This report adds a fifth lever – capacity building – since all countries need the
3910 knowledge and skills to understand, enable and navigate context-specific transformative
3911 change. Supporting the transformation process entails enhancing capacity in all countries
3912 for strategic direction and foresight; innovation and the generation of new alternatives;
3913 orchestration, engagement and negotiation; identifying and overcoming impediments; and
3914 in learning and resilience.

3915 While these entry points are valuable globally, applying them locally will require
3916 contextualized strategies and actions. Countries and local governments will need to develop
3917 their own strategies and implementation plans in line with domestic priorities and practices.
3918 To do so they need to understand how SDGs are interlinked, how progress in one SDG
3919 supports progress in others, and how to address trade-offs and maximize synergies, whilst
3920 promoting social cohesion, equality, and participation, at local, sub-national, national,
3921 regional, and international levels.

3922 These systemic changes need to increase harmony with nature. Human livelihoods, culture
3923 and well-being depend on biodiversity, and the health of landscapes, ecosystems, and
3924 oceans. SDG achievements will be short-lived if they are accompanied by overuse and
3925 degradation of the natural environment.

3926 To guide policymakers as they engage with SDGs, this chapter presents a series of calls for
3927 action. First, that the United Nations Member States establish a shared SDG Transformation
3928 Framework, to support transformation processes globally and locally across all the stages of
3929 transformation. Second, it provides recommendations on how to build the capacity of state
3930 and non-state stakeholders. Third, for each of the six entry-points there are game-changing
3931 interventions that will tap into synergies and help manage trade-offs. Fourth, given the
3932 changing contexts identified in chapters 1 and 2, there are proposed measures for
3933 improving the fundamental conditions for implementation. Finally, there are
3934 recommendations on how science, policy and society can work together for a future where
3935 people and nature can thrive as one.

3936 **Establish an SDG Transformation Framework for Accelerated Action by 2024**

3937 Business-as-usual approaches will not achieve the SDGs by 2030 or even 2050. To achieve
3938 progress locally, nationally and globally to reach the SDGs will mean truly transformative
3939 action with radically new efforts and approaches. This Report recommends therefore that at
3940 HLPF 2024 Member States agree on a Transformation Framework for Accelerated Action
3941 that brings together local action with international cooperation and thus reflects local
3942 contexts, needs, aspirations and capabilities.

3943 Six essential steps and elements for this Transformation Framework would be needed to
3944 actively embrace transformative change:

- 3945 (1) Develop **National Plans for Transformative Accelerated Action** that are underpinned
3946 by strong scientific evidence within a context of local and indigenous knowledge and
3947 meaningful public engagement. Plans should pursue action where SDG indicators

show stagnant or negative trends, and should use appropriate levers to implement synergistic interventions that are truly transformative in pushing progress across interlinked SDGs. Negative transboundary spillovers should be targeted and reduced. Plans of action should clearly identify impediments in each entry-point and at each phase of transformation and take action to address these. Individual and collective action levers should be employed for inclusive, bottom-up decision-making that engages all sectors, all segments of the population and subnational entities so that no one is left behind. National plans should also include action for international cooperation and, wherever possible, link SDG action with the implementation of global commitments under the Paris Agreement, the Kunming-Montreal Global Biodiversity Framework and the Sendai Framework. Developing national targets, as mentioned in paragraph 55 of the 2030 agenda, is strongly recommended in this regard.

- (2) **Local governments, business and industry associations, and institutional investors should be encouraged to develop similar plans**, and feed into national plans. Many actors in these sectors are innovating and experimenting with SDG action, and there is a need to better share learning, jointly evaluate and recognize successful steps.
- (3) Employ **national and international economic and financial levers** to accelerate transformations towards just and sustainable economies and infrastructures, including incentives for behaviour change of individuals and of corporate decision-making. Efforts should strengthen the Addis Ababa Action Agenda framework for aligning domestic and international resource flows towards SDG implementation, and for increasing fiscal space, i.e. through increasing tax revenue and official development assistance, combating illicit financial flows, achieving debt relief and restructuring, so that no country is left behind. Reforming financial, tax, and budgetary operations systems, and moving from silo-specific to interlinked, issue-based systems will be crucial. Environmental, social, and governance (ESG) investments should be linked to the SDGs using a corresponding index. At the multilateral level, progress is also needed in reforming the international financial architecture.
- (4) Invest in **data, science-based tools and policy learning** to improve policy planning and implementation. This would include a focus on improving the quality of data and developing a funded and credible plan for closing the SDG data gap globally by 2030. Increasing investments for R&D in low- and middle-income countries is also needed. Development of a broader range of economic and non-economic metrics is also needed that reflect the value of human life and nature for monitoring progress in improving human well-being, economic performance and the provision of public goods.
- (5) Establish a new partnership for **enhancing the science-policy-society interface** to increase the use of science and scientific evidence and strengthen trust in science and public information. Necessary action includes stronger scientific advisory systems for government departments, open science and cross-border partnerships aligned with specific SDGs and entry-points, South-South partnerships and capacity development in research, knowledge translation, and evidence use.

3992 (6) Invest in **improving accountability** of governments and other stakeholders on
3993 implementing the SDGs at international, regional, national, and sub-national levels.
3994 Government action should be supervised by parliaments. Civil society organisations
3995 should hold governments accountable while also making inputs into national and
3996 local policy learning. Global implementation of the Transformation Framework
3997 should be monitored by the High-level Political Forum. Monitoring and reporting
3998 should also include action at sub-national levels and by the corporate sector.

3999 **Build capacity for transformation**

4000 Strategic transformations for the SDGs rely on a wide range of capacities and skills at
4001 individual, institutional and network levels. Therefore, national acceleration plans should
4002 invest in the capacities to strategize, innovate, manage conflicts, identify and overcome
4003 impediments and cope with crises and risks. For this purpose, governments may need to
4004 reorganise policymaking and public administration to improve horizontal coordination,
4005 between departments, and vertical coordination, across levels of government. They will also
4006 need to integrate policies from multiple fields and goals – for example, between agriculture,
4007 environment, water, social and labour policies, in line with the interlinked nature of the
4008 SDGs. Such coordination will allow for regulation and setting incentives that transform
4009 decision-making and behaviour patterns in households and in the private sector in a way
4010 that is coherent with the SDGs, and takes advantage of synergies and minimises trade-offs.

4011 Specific measures for capacity building include:

- 4012 ● *Management for transformation* – Develop capacity of key stakeholders (policy
4013 makers, academics, CEOs, civil society organisations) for driving and managing
4014 sustainability transitions in a strategic and systematic manner, including inter-
4015 ministerial collaborations with shared vision for long-term goals.
- 4016 ● *Foresight capacity* – International organisations and governments should strengthen
4017 foresight capacity to develop visions for long-term sustainable development to 2050
4018 and beyond, and to better understand and respond to external shocks and new
4019 opportunities for transformation.
- 4020 ● *Effective public engagement* – Engage citizen groups, youth, women’s groups,
4021 indigenous communities, marginalised groups, philanthropists and other groups in
4022 the quest for transformative change towards sustainability. Safe spaces for youth,
4023 people with disabilities, and marginalised groups may be needed for effective
4024 engagement.
- 4025 ● *Suitable knowledge production* – Strengthen the process of producing, validating and
4026 disseminating socially-robust scientific knowledge for the SDGs and inclusion of
4027 indigenous knowledge into scientific processes.
- 4028 ● *Strengthening the science-policy-society interface* – Establish platforms for
4029 interaction between academia, think tanks, policymakers, practitioners and the
4030 public, focussed on key interventions. Reinforce public trust in science by promoting
4031 learning models throughout the education system that teach students and the
4032 general public how to filter materials and recognize misinformation.

- 4033 ● *Negotiation and conflict resolution skills* – Countries should build the capacities
4034 needed for negotiations to navigate the acceleration phase, conflict resolution,
4035 mediation across scales, designing effective policy mixes, overcoming system lock-
4036 ins, encouraging horizontal and vertical coordination, and orchestrating various
4037 actors.
- 4038 ● *Incorporate the SDGs in codes of conduct and business strategies* – Multinational and
4039 large-scale companies should use their influence within their supply chains to make
4040 their processes and financial goals compatible with the SDGs. Equally, consumers
4041 should exert their individual and collective voice to demand that the quality of the
4042 goods they buy is closely aligned with multiple SDGs prioritising the interlinkages
4043 across goals.

4044 **Push transformation by activating synergies in the six entry-points**

4045 Putting the SDG Transformation Framework to work requires locally relevant, synergistic
4046 and integrated implementation that breaks down the silos of public service and
4047 policymaking. Drawing on global scenario studies and other evidence, we recommend key
4048 interventions with systemic effects for each entry-point and across them.

4049 *Entry-point 1: Human well-being and capabilities*

- 4050 ● *Universal social protection and universal health coverage* – To reduce inequalities
4051 within and between societies, eradicate poverty and build resilience to shocks,
4052 governments should establish national systems for universal social protection and
4053 accelerate the implementation of universal health coverage as established in the
4054 2030 Agenda. Universal social protection needs to be adaptive, to reach those left
4055 behind, including those affected by emergencies and crises. With universal social
4056 protection as a floor, governments should consider further measures, to tackle rising
4057 inequalities, such as progressive taxation, citizen funds or universal basic incomes.
4058 Universal health coverage should go hand-in-hand with empowering communities to
4059 build healthy environments that promote physical, mental and social well-being and
4060 the implementation of the SDGs.
- 4061 ● *Education* – Education builds engaged and informed societies and capabilities for
4062 addressing the world's biggest challenges. It is crucial to keep the promise of a
4063 minimum of 12 years of quality schooling for every girl and boy in the world.
4064 Education systems need to be transformed to ensure that everyone is equipped with
4065 the knowledge and skills that enable innovation, resilience, and creativity. The
4066 promotion of STEM education, particularly for women and girls, will be valuable for
4067 advancing sustainability.
- 4068 ● *Co-benefits* – Policymakers should promote human well-being as a co-benefit of
4069 other policies, and this co-benefit reasoning should be formally and systematically
4070 included in cost-benefit analyses and impact assessments, in line with the inter-
4071 linkag ethos of the SDGs. Better insulation of houses, for example, can benefit
4072 health, and reduce CO₂ emissions. Targeted interventions to secure universal safe
4073 and efficient water and sanitation services have benefits for human health,
4074 reduction of poverty and inequality, improve girls' and women's safety as well as

4075 environmental health. Utilising domestic capital and recovering the costs of
4076 operations and maintenance from tariffs, with due attention to equity, has positive
4077 economic effects and empowers regulatory authorities.

4078 *Entry-point 2: Sustainable and just economies*

- 4079 ● *Economic policies* – Key interventions should focus on reducing structural
4080 inequalities, and promoting pro-poor growth, gender equity, and decent work as
4081 part of whole-of-economy decarbonisation and progressive redistribution, funded
4082 through tax reforms for increased revenue and the introduction of global carbon
4083 pricing. Policies for resource efficiency, circular and sharing economies are crucial.
- 4084 ● *Renewable energy* – International cooperation and proactive public policies should
4085 encourage market forces to scale up renewable energy capacity, development and
4086 deployment of energy storage technologies, and rapid expansion of electric vehicles.
4087 Linkages with SDGs 1 (poverty eradication) and SDG 10 (reducing inequalities) should
4088 be used to harvest and amplify positive spillovers and minimize negative social
4089 effects.
- 4090 ● *Climate adaptation* – Governments and the private sector need to invest in
4091 adaptation to climate change, for example, by climate-proofing public infrastructure
4092 and systems of production and distribution, and by promoting climate-smart
4093 agriculture.
- 4094 ● *Implement just transition* – Governments should ensure just transitions by investing
4095 in a healthy economy, a clean environment and fairness for those negatively
4096 impacted. Unintended negative effects need to be anticipated as early as possible.
4097 Measures can include compensation, redundancy payments, early-retirement
4098 benefits and social safety nets, as well as helping with skills upgrading, retraining,
4099 alternative employment, and regional innovation or development policies.
4100 Governments can also provide incentives for existing industries and organisations
4101 that are willing to innovate and adopt new sustainable alternatives.

4102
4103 *Entry-point 3: Sustainable food systems and nutrition patterns*

- 4104 ● *Food security and nutrition* – Address key food systems, including fisheries and
4105 aquaculture, and their challenges, such as eliminating hunger and malnutrition,
4106 which are especially prevalent in the Global South, and ensure food security.
- 4107 ● *Multifunctional agriculture and agro-ecology* – Shift to regenerative, ecological and
4108 multifunctional agriculture systems that protect soil fertility and biodiversity,
4109 including more efficient use of water and fertilisers, reducing emissions and
4110 increasing the absorption of greenhouse gases and adapting to the impacts of
4111 climate change. Increase water-use efficiency in agriculture through safe wastewater
4112 reuse and reducing food loss and waste. Scale up agro-ecological practices, improve
4113 the quality of connection to consumer markets, strengthen agri-food processing by
4114 local entrepreneurs, establish more open and inclusive governance, and build the
4115 capacity of food systems actors.
- 4116 ● *Reform food production, promote healthier diets* – Develop the infrastructure and
4117 systems for producing sufficient nutrient-rich and affordable staple foods, reducing

losses in processing, storage and transport. Promote diverse and healthier diets, discourage overconsumption of animal-based foods and sugars, starting early in life at schools. Sustainable food systems should crowd out products that have low or no nutritional value. Reform public food procurement along the chain of agricultural production, processing, transport and consumption, making supply chains more resilient, farming more productive and sustainable, and diets healthier.

Entry-point 4: Energy decarbonization with universal access

- *Accelerate decarbonization* – Phase-out fossil fuels in a manner that is globally and domestically just, while strengthening the transition to renewables by increasing energy efficiency and encouraging behavioural change. High-income countries should lead international cooperation in eliminating fossil fuel subsidies and promoting carbon pricing and limiting new exploration and exploitation of reserves. Governments can design pathways for a just transition based on evidence and scenarios and equipped with necessary funding.
- *Universal access to clean energy* – Provide universal and secure access to clean energy within and between countries and support communities most impacted by climate change. This includes access to electricity as well as access to clean cooking fuels and technologies, which are particularly essential for the health, wellbeing and economic opportunities of women and girls.
- *Transitions in African countries* – Energy inequality is especially large on the African continent, where governments, regional organisations and development partners should enable locally tailored energy transitions to meet long-term development objectives. This includes increasing the use of renewables, decreasing fossil fuels, using indigenous and local knowledge, and skills and institutions that can enable African policymakers, the private sector, NGOs, CSOs and scientists to work together for energy decarbonization with universal access. Similar initiatives should be made for other countries and regions strongly affected by energy poverty.
- *Climate justice* – Greenhouse gas emissions should be monitored for both production and consumption and take into account each country's level of development and emissions by income group. In an effective global climate regime, historically high emitters must take the lead in reaching net zero, while transferring the necessary technologies to low- and middle-income countries and building their capabilities. The least developed countries, for example, will need significant emissions headroom but all countries should work towards zero carbon transformations for multiple wins.

Entry-point 5: Urban and peri-urban development

- *Green infrastructure for transformation* – Renew infrastructure to favour collective transport and people's mobility, energy conservation in buildings, circularity in the waste cycle, protecting and expanding green areas and taking advantage of digital technologies.
- *Integrated planning* – Cities should lead the way in integrated planning for SDG implementation across all entry-points, and in disaster risk reduction given the

multiple risks – including climate change, pandemics, and displacement - acknowledging the interlinkages across SDGs and the role of living spaces to contribute towards the goal of healthier societies.

- *International solidarity* – Violent conflicts, climate change impacts and governance deficiencies in rural areas and regions are closely related and call for greater solidarity from the international community including, but not limited to, support to within-country and international migrants.

Entry-point 6: *Global environmental commons*

- *Protected areas* – Expand protected areas to at least 30 per cent of terrestrial and inland water areas, and of marine and coastal areas, especially those of particular importance for biodiversity and ecosystem functions and services, and restore at least 30 per cent of degraded terrestrial, inland water, and marine and coastal ecosystems. This should be done by respecting the rights of indigenous peoples and local communities, regulating land use, adopting landscape-level conservation planning, and promoting a progressive shift in societal preferences and lifestyles. Recognise the linkages between human and animal health, and the environment.
- *Cooperating for biodiversity protection* – Governments and organisations should urgently implement the Kunming-Montreal Global Biodiversity Framework (GBF) and enable participation at all levels of government to cooperate at transboundary, regional, and international levels. Civil society organisations and non-governmental organisations can make important contributions and should be supported. Reversing biodiversity loss will require action-oriented planning and resource mobilisation.
- *United Nations* – The UN General Assembly should acknowledge the GBF and take it into account when monitoring progress towards the SDGs and to cooperate with other conventions and international organisations for ensuring harmony with nature, on land and in oceans.
- *Better indicators* – Governments, science and statistical offices should jointly start using indicators that better measure the capacity of economies and societies to protect and promote human well-being in key decision-making processes, while addressing planetary well-being – to reflect the dimensions of social equality, and the economic, social, cultural, and ecological functions of ecosystems and biodiversity.

Improve critical underlying conditions for SDG implementation

Healthier and resilient societies are essential for long-term sustainability. The past three years have shown how vulnerable societies are to sudden shocks from pandemics, conflicts, inflation and rising costs of living when they lack provisions for solidarity and equity.

In addition to acute shocks, this Report assesses five trends that have their own slow and persistent dynamics and can lead to disruptions: climate change, rising inequality, biodiversity loss, demographic change, and digitalization. These trends need to be countered and shaped – by governments, multilateral institutions, regional organisations, civil society organisations, and development actors. Specific actions include:

- 4202 ● *Prevent and avoid violent conflict* – Engage in conflict resolution and support the
- 4203 reform of institutions and governance to allow for active, inclusive and fair
- 4204 participation in decision-making.
- 4205 ● *Ensure the necessary fiscal space* – Provide debt relief from all major lenders to
- 4206 developing countries and strengthen their capacities for taxation and fiscal policy.
- 4207 Developed and developing countries should reform international financial
- 4208 institutions, as well as national and multilateral development banks, to focus more
- 4209 strongly on the SDGs and the provision of global public goods.
- 4210 ● *Focus on marginalised groups* – Prioritise the perspectives of communities and
- 4211 people experiencing marginalisation including women and girls, LGBTIQIA, persons
- 4212 with disabilities, children, youth, older persons, migrants, refugees, internally
- 4213 displaced persons, and indigenous peoples, to ensure meaningful inclusion and
- 4214 strengthen their capacity to engage in formal decision-making.
- 4215 ● *Take advantage of the digital transformation* – Maximise its potential for financial
- 4216 inclusion, close the digital divide, and minimise any damaging outcomes. Ensure
- 4217 open, free and secure digital spaces while reducing disinformation and fake news and
- 4218 contributing to a global code of conduct for the integrity of public information.
- 4219 ● *Ensure gender equality* – Focus on achieving equality in four areas:
- 4220 ○ *Legislation* – Eliminate unequal practices leading to gender-pay gaps, the
- 4221 under-representation of women and girls in positions of leadership, and the
- 4222 under-valuing of women’s domestic and care work. Regional blocks should
- 4223 strengthen commitments to gender equality and review progress in
- 4224 implementation.
- 4225 ○ *Elimination of harmful practices* – Strengthen national and local leadership to
- 4226 implement laws banning harmful practices such as female genital mutilation,
- 4227 child marriages, rape, and other forms of gender-based violence and
- 4228 discrimination.
- 4229 ○ *Education* – Commit financial resources to provide 12 years of compulsory
- 4230 and free education for every child; strengthen programmes that encourage
- 4231 girls and women in science and technology and research leadership roles.
- 4232 ○ *Reproductive health* – Provide comprehensive information and improve
- 4233 access to affordable sexual and reproductive health services.

4234 **Transforming Science for Sustainable Development**

4235 Sustainable development pathways benefit most from science that is multidisciplinary,

4236 equitable and inclusively produced, openly shared, widely trusted and embraced, and

4237 socially relevant and robust. Science and technology can produce socially robust insights

4238 and innovation in an atmosphere of diversity, ensuring participation of women and girls,

4239 and all groups of society, as both creators and users. Policymakers, public interest groups,

4240 industry and teachers should have open access to the body of scientific knowledge,

4241 including publications, data and software, drawing the full benefits of science as a public

4242 good.

- 4243 ● *Performance indicators* – Governments should encourage scientific institutions to
- 4244 adopt key performance indicators that reward impact-oriented work and inter- and

trans-disciplinary research on concepts, approaches, tools, methods, and empirical processes of implementation of the SDGs.

- *Empirical research* – Funders and development partners should invest in empirical research on SDG implementation including interlinkages and spillovers, as well as in empirically measuring success, including gender disaggregated impacts, to provide evidence for improved implementation.
- *Support for low-income countries* – Strengthen their capacities and institutions for research and academic training and increase access to knowledge, fostering South-to-South collaborations. Increased funding for research systems should strive for equitable partnerships as a key driver for SDGs.
- *Open science* – Develop an enabling policy environment as well as infrastructure and services that promote open science, global collaboration and open access to publications, data, software and research outputs for implementing the SDGs.
- *The Global Sustainable Development Report* – Increase human and financial resources for the GSDR, to review and synthesise the science required for successful implementation of the SDGs and help local governments and communities to respond to global problems.
- *Mechanisms for knowledge sharing* – Establish strong mechanisms for knowledge sharing to address global challenges and ensure access to science-based solutions. Strengthen cooperation on access to science, technology and innovation including through the Technology Facilitation Mechanism.

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Appendix 1: Literature on SDG interlinkages and summary of findings

The 2019 GSDR presented an analysis of SDG interlinkages. The authors conducted a review of 112 scientific articles and 65 global assessments with explicit reference to the SDGs. The interlinkages between the SDGs were subsequently assessed using the seven-point scale developed by the International Science Council (<https://council.science/wp-content/uploads/2017/05/SDGs-Guide-to-Interactions.pdf>). Since 2019, the literature on SDG interlinkages has grown rapidly. The 2023 GSDR presents a synthesis of the literature published between 2019-2022. The analysis is based on a review of i) global and non-context-specific assessments, and ii) assessments of SDG interlinkages for different country-, income-, and population groups. Only publications that analyze interlinkages between all 17 SDGs were included in the review. In total, 4997 publications were screened for eligibility. The final sample consists of 52 publications. Many of these publications establish that there are interlinkages between the SDGs without providing further information about the nature of these connections. However, the 2023 GSDR synthesis focuses specifically on the sub-set of publications that clearly identify trade-offs and synergies between the SDGs. The following table provides an overview of the publications providing supporting evidence for SDG trade-offs and synergies.

Publications providing supporting evidence for SDG trade-offs and synergies

	Trade-offs identified in the following publications	Synergies identified in the following publications
SDG 1	Kroll et al., 2019	Kroll et al., 2019 Dawes, 2020, 2022 Pham-Truffert et al., 2020 Anderson et al., 2021 Hegre et al., 2020 Warchold et al., 2021 Wu, 2022 Barbier & Burgess, 2019 Cernev & Fenner, 2020
SDG 2	Pham-Truffert et al., 2020 Miola et al., 2019 Boar et al., 2022 Warchold et al., 2021	Dawes, 2020, 2022 Hegre et al., 2020 Cernev & Fenner, 2020 Barbier & Burgess, 2019 Pham-Truffert et al., 2020

SDG 3	Pham-Truffert et al., 2020 Warchold et al., 2021 Kroll et al., 2019	Kroll et al., 2019 Dawes, 2020, 2022 Miola et al., 2019 Anderson et al., 2021 Hegre et al., 2020 Warchold et al., 2021 Wu, 2022 Asadikia et al., 2021 Barbier & Burgess, 2019 Kunčič, 2019 Cernev & Fenner, 2020 Pham-Truffert et al., 2020
SDG 4	Anderson et al., 2021 Pham-Truffert et al., 2020	Pham-Truffert et al., 2020 Boar et al., 2022 Hegre et al., 2020 Warchold et al., 2021 Wu, 2022 Asadikia et al., 2021 Cernev & Fenner, 2020 Barbier & Burgess, 2019
SDG 5	Warchold et al., 2021 Pham-Truffert et al., 2020	Miola et al., 2019 Anderson et al., 2021 Hegre et al., 2020 Warchold et al., 2021 Wu, 2022 Barbier & Burgess, 2019 Pham-Truffert et al., 2020
SDG 6	Pham-Truffert et al., 2020	Pham-Truffert et al., 2020 Anderson et al., 2021 Hegre et al., 2020 Warchold et al., 2021 Wu, 2022 Barbier & Burgess, 2019
SDG 7	Pham-Truffert et al., 2020 Warchold et al., 2021 Kroll et al., 2019	Kroll et al., 2019 Boar et al., 2022 Anderson et al., 2021 Hegre et al., 2020 Warchold et al., 2021 Wu, 2022 Asadikia et al., 2021 Barbier & Burgess, 2019 Dawes, 2022 Pham-Truffert et al., 2020

SDG 8	Pham-Truffert et al., 2020 Boar et al., 2022 Cernev & Fenner, 2020	Kroll et al., 2019 Hegre et al., 2020 Wu, 2022 Cernev & Fenner, 2020 Pham-Truffert et al., 2020
SDG 9	Kroll et al., 2019 Pham-Truffert et al., 2020	Kroll et al., 2019 Miola et al., 2019 Wu, 2022 Pham-Truffert et al., 2020
SDG 10	Pham-Truffert et al., 2020 Anderson et al., 2021 Hegre et al., 2020 Lusseau & Mancini, 2019	Barbier & Burgess, 2019 Pham-Truffert et al., 2020
SDG 11	Kroll et al., 2019 Anderson et al., 2021 Barbier & Burgess, 2019 Pham-Truffert et al., 2020	Hegre et al., 2020 Pham-Truffert et al., 2020
SDG 12	Boar et al., 2022 Anderson et al., 2021 Warchold et al., 2021 Wu, 2022 Kunčič, 2019 Lusseau & Mancini, 2019 Pham-Truffert et al., 2020	Dawes, 2022 Pham-Truffert et al., 2020 Cernev & Fenner, 2020
SDG 13	Kroll et al., 2019 Wu, 2022 Barbier & Burgess, 2019 Lusseau & Mancini, 2019 Randers et al., 2019 Pham-Truffert et al., 2020	Cernev & Fenner, 2020 Pham-Truffert et al., 2020
SDG 14	Kroll et al., 2019 Dawes, 2020, 2022 Pham-Truffert et al., 2020 Wu, 2022 Barbier & Burgess, 2019 Randers et al., 2019	Pham-Truffert et al., 2020 Cernev & Fenner, 2020
SDG 15	Dawes, 2020, 2022 Pham-Truffert et al., 2020 Wu, 2022	Pham-Truffert et al., 2020 Cernev & Fenner, 2020

	Barbier & Burgess, 2019 Randers et al., 2019	
SDG 16	Kroll et al., 2019 Anderson et al., 2021 Pham-Truffert et al., 2020	Pham-Truffert et al., 2020 Wu, 2022 Cernev & Fenner, 2020
SDG 17	Kroll et al., 2019 Warchold et al., 2021 Wu, 2022 Pham-Truffert et al., 2020	Dawes, 2022 Pham-Truffert et al., 2020 Anderson et al., 2021 Hegre et al., 2020 Cernev & Fenner, 2020 Barbier & Burgess, 2019 Warchold et al., 2021

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5757 [022-00868-x](https://doi.org/10.1038/s41893-022-00868-x)

5758 **ANNEX 1: Independent Group of Scientists**

 Ms. Imme Scholz, Germany (Co-Chair)	 Mr. J. Jaime Miranda, Peru (Co- Chair)	 Mr. John Agard, Trinidad and Tobago (Co-Chair, 2020- 2021)	 Mr. Ambuj Sagar, India	 Ms. Kaltham Al - Ghanim, Qatar
 Mr. Sergey N. Bobylev, Russia	 Ms. Opha Pauline Dube, Botswana	 Ms. Shirin Malekpour, Australia	 Mr. Jaime C. Montoya, Philippines	 Mr. Jiahua Pan, China
 Ms. Åsa Persson, Sweden	 Ms. Nancy Shackell, Canada	 Mr. Ibrahima Hathie, Senegal	 Mr. Norichika Kanie, Japan	 Ms. Nyovani Janet Madise, Malawi

5759

5760 **ANNEX 2: Regional Consultations to inform the GSDR**

5761 Together with partners, the United Nations Department of Economic and Social Affairs,
5762 Division for Sustainable Development Goals (DESA/DSDG) organized a series of regional
5763 consultations to inform the 2023 GSDR. These consultations brought together experts from
5764 academia, civil society, government officials participating in their individual capacity, the
5765 private sector, and other stakeholders to share experiences and perspectives. Additional
5766 consultations were held in virtual and hybrid form in China, Japan and Australia. Some
5767 examples and case studies from these consultations have been incorporated in the current
5768 draft.

5769 Locations of regional consultations:

5770 Latin America and the Caribbean, Lima, Peru (7-9 November 2022)

5771 Africa, Dakar, Senegal (14-16 November 2022)

5772 Asia and the Pacific, Manila, Philippines (28-30 November 2022)

5773 Africa, Lilongwe, Malawi (30 November – 2 December 2022)

5774 Western Asia, Doha, Qatar (24-25 January 2023)

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5784 Additional partners:

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5786 Chinese Academy of Social Sciences

5787 Initiative Prospective Agricole et Rurale

5788 Ministry of Science and Technology of the Philippines

5789 Social and Economic Survey Research Institute, Qatar University

5790 Universidad Peruana Cayetano Heredia

5791

5792 **ANNEX 3: Scientific review of the draft of the 2023 GSDR**

5793 The scientific review of the draft 2023 Global Sustainable Development Report was led by
5794 the International Science Council (ISC) at the invitation of the Department of Economic and
5795 Social Affairs of the United Nations (UNDESA). The review took place between 09
5796 September and 02 October 2022 based on the embargoed first-order draft of the GSDR
5797 shared by UN DESA with the ISC on 07 September 2022. Comments from 104 reviewers
5798 were received during the review period. The ISC set up a multidisciplinary working group
5799 composed of 16 experts. The working group's role was to support the ISC secretariat by
5800 advising on the review process, reviewing the full draft GSDR report, and synthesizing the
5801 review comments from the large pool of reviewers. The review led to the production of two
5802 outputs: a table compiling all the comments received from the large pool of reviewers and a
5803 synthesis report by the working group structuring and summarizing the main findings from
5804 the review process, intended for the Independent Group of Scientists, UN DESA and any
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ANNEX 4: Ministerial declaration of the 2016 high-level political forum on sustainable development, convened under the auspices of the Economic and Social Council, on the theme “Ensuring that no one is left behind”

(E/HLS/2016/1)

We, the Ministers and high representatives, having met at United Nations Headquarters in New York,

1. Pledge that no one will be left behind in implementing the 2030 Agenda for Sustainable Development. In this first high-level political forum for sustainable development to be convened following its historic adoption, we underscore the need for its 17 Sustainable Development Goals and 169 targets to be met for all nations and peoples and for all segments of society. We stress that the 2030 Agenda is people-centred, universal and transformative and that its Goals and targets are integrated and indivisible and balance the three dimensions of sustainable development — economic, social and environmental. It is a plan of action for people, planet and prosperity that also seeks to strengthen universal peace in larger freedom, to be implemented by all countries and stakeholders, acting in collaborative partnership. We reaffirm all the principles recognized in the Agenda, and that eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development;

2. Emphasize that the high-level political forum is called to provide political leadership, guidance and recommendations for the implementation of sustainable development commitments, and that it has a central role in overseeing a network of follow-up and review processes of the 2030 Agenda at the global level, working coherently with the General Assembly, the Economic and Social Council and other relevant organs and forums, in line with existing mandates. It will, inter alia, facilitate the sharing of experiences and best practices and promote system-wide coherence and coordination of sustainable development policies, considering that the 2030 Agenda is applicable to all, taking into account different national realities, capacities and levels of development and respecting each country’s policy space, and to be implemented consistent with the sovereign rights and obligations of States under international law and with the Charter of the United Nations;

3. Welcome early efforts in implementing the 2030 Agenda at all levels, building on the achievements of the Millennium Development Goals and seeking to address their unfinished business. We are encouraged by these efforts and, in this first year of its implementation, look forward to further progress in, inter alia, revitalizing and enhancing the Global Partnership for Sustainable Development, aligning existing policies with the new global plan of action, increasing policy and system-wide coherence and integration for achieving the Sustainable Development Goals and targets, addressing existing and emerging challenges, enhancing national capacities for evidence-based and data-driven decision-making, and favouring participatory, cooperative and enabling environments at all levels. We take note with appreciation of the Secretary-General’s first annual progress report on the Sustainable Development Goals;

4. Have considered the theme of the 2016 high-level political forum, “Ensuring that no one is left behind”, and highlight in this regard that the dignity of the human person

5935 is fundamental, and that we endeavour to reach the furthest behind and the most
5936 vulnerable first. To ensure that no one is left behind, we are working to eradicate poverty
5937 and hunger and achieve sustainable development in its three dimensions, inter alia, by
5938 promoting inclusive economic growth, protecting the environment and promoting social
5939 inclusion in an integrated manner. We will ensure gender equality and women's and girls'
5940 empowerment. We will also promote peaceful and inclusive societies, respect and promote
5941 all human rights, and promote an equitable global economic system in which no country,
5942 people or person is left behind, enabling decent work and productive livelihoods for all,
5943 while preserving the planet for our children and future generations. We strive for a world of
5944 peace, free of fear and violence and free from terrorism. We pledge to make such a world a
5945 reality;

5946 5. Commit, in our endeavour to ensure that no one is left behind, to focusing
5947 our efforts where the challenges are greatest, including by ensuring the inclusion and
5948 participation of those who are furthest behind. We deem it of critical importance, in this
5949 regard, to protect and empower people who are vulnerable. We recall that those whose
5950 needs are reflected in the 2030 Agenda include all children, adolescents, youth, persons
5951 with disabilities, people living with HIV/AIDS, older persons, indigenous peoples, refugees
5952 and internally displaced persons, migrants and peoples living in areas affected by complex
5953 humanitarian emergencies, and peoples in areas affected by terrorism and conflict;

5954 6. Emphasize that, to ensure that no one is left behind, we are committed to
5955 making real a world free of poverty, hunger, disease, want and environmental degradation,
5956 where all life can thrive; a world with universal literacy and with equitable and universal
5957 access to quality education at all levels and to health care and social protection, where
5958 physical, mental and social well-being are assured, where we reaffirm our commitments
5959 regarding the human right to safe drinking water and sanitation and where there is
5960 improved hygiene, and where food is sufficient, safe, affordable and nutritious;

5961 7. Recognize that sustainable development cannot be realized without peace
5962 and security, and that peace and security will be at risk without sustainable development.
5963 The 2030 Agenda recognizes the need to build peaceful, just and inclusive societies that
5964 provide equal access to justice and that are based on respect for human rights, including the
5965 right to development, on effective rule of law and good governance at all levels and on
5966 transparent, effective and accountable institutions. Factors which give rise to violence,
5967 insecurity and injustice, such as inequality, corruption, poor governance and illicit financial
5968 and arms flows, are addressed in the Agenda. We must redouble our efforts to resolve or
5969 prevent conflict and to support post-conflict countries, including by ensuring that women
5970 have a role in peacebuilding and State-building. We call for further effective measures and
5971 actions to be taken, in conformity with international law, to remove the obstacles to the full
5972 realization of the right of self-determination of peoples living under colonial and foreign
5973 occupation, which continue to adversely affect their economic and social development as
5974 well as their environment;

5975 8. Emphasize that universal respect for human rights and human dignity, peace,
5976 justice, equality and non-discrimination is central to our commitment to leaving no one
5977 behind. Our commitment also includes respect for race, ethnicity and cultural diversity, and
5978 equal opportunity, permitting the full realization of human potential and contributing to

5979 shared prosperity. We are committed to a world that invests in its children and youth and in
5980 which every child grows up free from all forms of violence and exploitation. We envision a
5981 world in which every woman and girl enjoys full gender equality and all legal, social and
5982 economic barriers to their empowerment have been removed. We will strive for a world
5983 where young women and young men are key agents of change, supported by a culture of
5984 innovation, sustainability and inclusiveness, to enable a better future for themselves and
5985 their communities; a just, equitable, tolerant, open, creative and socially inclusive world in
5986 which the needs of the most vulnerable are met;

5987 9. Also emphasize our commitment to making real a world in which every
5988 country enjoys sustained, inclusive and sustainable economic growth and decent work for
5989 all, in which consumption and production patterns and the use of all natural resources are
5990 sustainable; a world in which development is climate-sensitive and respects biodiversity,
5991 where we restore and conserve and sustainably use all ecosystems and strengthen our
5992 cooperation to prevent environmental degradation and promote resilience and disaster risk
5993 reduction; a world where human settlements and the application of technology are
5994 inclusive, safe, resilient and sustainable and where there is universal access to safe,
5995 affordable, reliable and sustainable transport and energy systems; a world in which
5996 humanity lives in harmony with nature and in which wildlife and other living species are
5997 protected;

5998 10. Stress that realizing gender equality and the empowerment of all women and
5999 girls will make a crucial contribution to progress across all the Goals and targets. Women
6000 and girls should enjoy equal access to quality education at all levels, health-care services,
6001 economic and natural resources and civil and political participation as well as equal
6002 opportunities with men and boys for employment, leadership and decision-making at all
6003 levels. We will work for a significant increase in investments to close the gender gap and
6004 strengthen support for institutions in relation to gender equality and the empowerment of
6005 all women and girls at the global, regional and national levels. We strive for a world where
6006 all forms of discrimination and violence against women and girls will be eliminated,
6007 including through the engagement of men and boys. The systematic mainstreaming of a
6008 gender perspective into the implementation of the 2030 Agenda is crucial;

6009 11. Welcome the numerous contributions made by the United Nations and other
6010 relevant intergovernmental bodies and forums to the implementation of the 2030 Agenda,
6011 including the General Assembly and the Economic and Social Council, the United Nations
6012 development system and the United Nations specialized agencies. In the context of the
6013 high-level segment of the Economic and Social Council, we welcome its annual work,
6014 including that of its functional and regional commissions and segments, which has been
6015 guided by the theme “Implementing the post-2015 development agenda: moving from
6016 commitments to results”. The Council is key in supporting our efforts to ensure that no one
6017 is left behind by, inter alia, addressing existing and emerging challenges, facilitating multi-
6018 stakeholder participation and promoting system-wide coherence and coordination. We
6019 highlight the important contributions made by its forums on youth, on partnerships and on
6020 development cooperation; its segments on operational activities, on integration and on
6021 humanitarian affairs; its special meetings on inequality, on the El Niño phenomenon and on
6022 the Zika virus; and its dialogue on the longer-term positioning of the United Nations
6023 development system in the context of the 2030 Agenda, called to inform the upcoming

6024 quadrennial comprehensive policy review, among other activities related to the
6025 implementation of the 2030 Agenda. We look forward to the contributions of the Council
6026 and other relevant intergovernmental forums and bodies in the coming years, including on
6027 the thematic reviews of the 2030 Agenda;

6028 12. Stress, in regard to the thematic discussion of the Council's high-level
6029 segment on "Infrastructure for sustainable development for all", the attention given by the
6030 2030 Agenda to building resilient infrastructure and its particular connection with the
6031 promotion of inclusive and sustainable industrialization and the fostering of innovation. We
6032 are committed to addressing infrastructure gaps by, inter alia, improving investments and
6033 further building capacities within a coherent policy framework, and consider this key for
6034 reducing inequalities within and among countries. We also stress that infrastructure should
6035 be safe, accessible and people-centred, and promote economic integration and connectivity,
6036 to ensure that no one is left behind;

6037 13. Recognize that the scale and ambition of the 2030 Agenda require a
6038 revitalized and enhanced Global Partnership for Sustainable Development to ensure its
6039 implementation, working in a spirit of global solidarity, in particular with the poorest and
6040 with people who are vulnerable. We are fully committed to this, and to moving from all
6041 commitments to results, working with all stakeholders. The provision of means of
6042 implementation, particularly as outlined under Goal 17 and under each Sustainable
6043 Development Goal, supported by the concrete policies and actions outlined in the Addis
6044 Ababa Action Agenda of the Third International Conference on Financing for Development,
6045 which is an integral part of the 2030 Agenda, is critical for achieving our ambitious goals and
6046 ensuring that no one is left behind;

6047 14. Welcome in this regard, inter alia, the holding of the inaugural forum on
6048 financing for development, take note of its intergovernmentally agreed conclusions and
6049 recommendations, and look forward to further advancement in the follow-up process. We
6050 also welcome the work of the United Nations Inter-Agency Task Force. We further welcome
6051 the progress made in operationalizing the three components of the Technology Facilitation
6052 Mechanism and the holding of the inaugural multi-stakeholder forum on science,
6053 technology and innovation for the Sustainable Development Goals, which is important, inter
6054 alia, to help facilitate the development, transfer and dissemination of relevant technologies
6055 for the Sustainable Development Goals. We look forward to the establishment of the online
6056 platform as part of the Mechanism. We also welcome the progress made in operationalizing
6057 the technology bank for the least developed countries;

6058 15. Highlight the importance of participatory and inclusive implementation,
6059 follow-up and review of the 2030 Agenda at all levels. We acknowledge the primary
6060 responsibilities of Governments in this regard. We also acknowledge the contribution of
6061 parliaments, subnational governments and all other relevant stakeholders, including the
6062 private sector, civil society, academia and philanthropic organizations. Their participation
6063 supports accountability to our citizens and enhances the effectiveness of our action,
6064 fostering synergies, multi-stakeholder partnerships and international cooperation, and the
6065 exchange of best practices and mutual learning. We welcome the participation and
6066 contributions of major groups and other relevant stakeholders in the high-level political
6067 forum and encourage their continued engagement in ensuring that no one is left behind;

16. Stress that the availability and use of accessible, timely, reliable and high-quality disaggregated data underpins our efforts to leave no one behind by, inter alia, identifying inequalities. Such data should measure poverty in all its forms and dimensions as well as progress on sustainable development, to reveal inequalities, gaps, progress and recurrent challenges, identify innovative solutions and inform the implementation of the 2030 Agenda at all levels. We are committed to developing broader measures of progress to complement gross domestic product. We urge Governments and international organizations, including the United Nations system, international financial institutions and other relevant stakeholders, to assist developing countries in further building and strengthening capacities for data collection, disaggregation, dissemination and analysis at all levels, taking into account that the global review of the 2030 Agenda will be based primarily on national official data sources. We welcome the decision of the Statistical Commission on the global indicator framework for the Sustainable Development Goals and targets prepared by the Inter-Agency and Expert Group on Sustainable Development Goal Indicators, which is a practical starting point, and look forward to its implementation and continual improvement in an inclusive and transparent manner;

17. Commend the 22 countries¹ that presented voluntary national reviews at the 2016 high-level political forum, and highlight the commitment and leadership shown by these countries in their early steps to implement the 2030 Agenda, including by integrating it into their national development and sustainable development strategies. Country-led reviews at the national level should be the foundation for voluntary reviews at the regional and global levels, as appropriate. Consistent with the 2030 Agenda, such reviews can promote the inclusive participation of all relevant stakeholders in its implementation, fostering national and subnational ownership and thus enhancing our efforts to ensure that no one is left behind. We stress the importance of building national capacities for follow-up and review, and the usefulness of making assistance available for preparing for the national voluntary reviews at the high-level political forum, including through voluntary guidance and methodologies to address issues such as the interlinkages among the Sustainable Development Goals. We encourage countries to take into consideration experience gained and lessons learned from these 22 State-led voluntary reviews, and to volunteer in the coming years;

18. Recognize the important role that regional and subregional forums can have in supporting the implementation of the 2030 Agenda, including its follow-up and review process, by, inter alia, promoting peer learning and cooperation, including South-South and triangular cooperation as appropriate, and helping to link the national and global levels of implementation. In this regard, we welcome the identification, development and convening of appropriate regional and subregional forums on sustainable development;

19. Stress that reducing vulnerability to climate change is a global challenge faced by all, in particular those living in poverty. We recognize the synergies of the Paris Agreement with the 2030 Agenda for Sustainable Development. We welcome the Paris Agreement, under which all parties will take urgent action to address climate change, and in that regard look forward to its prompt ratification, acceptance, approval or accession and its early entry into force and implementation. We also look forward to the mobilization of

6111 resources to assist its implementation. We recognize the specific needs and special
6112 circumstances of developing countries, especially those that are particularly vulnerable to
6113 the adverse effects of climate change;²

6114 20. Reiterate that each country faces specific challenges in its pursuit of
6115 sustainable development. The most vulnerable countries and, in particular, African
6116 countries, least developed countries, landlocked developing countries and small island
6117 developing States deserve special attention, as do countries in conflict and post-conflict
6118 situations. There are also serious challenges within many middle-income countries. In this
6119 regard, we welcome the progress made to date and reaffirm support for the Istanbul
6120 Programme of Action for the Least Developed Countries for the Decade 2011-2020, the SIDS
6121 Accelerated Modalities of Action (SAMOA Pathway) and the Vienna Programme of Action
6122 for Landlocked Developing Countries for the Decade 2014-2024, and reaffirm the
6123 importance of supporting the African Union's Agenda 2063 and the programme of the New
6124 Partnership for Africa's Development, to ensure that no one is left behind. We also take
6125 note of the principles set out in the New Deal for Engagement in Fragile States by the Group
6126 of Seven Plus, countries that are, or have been, affected by conflict;

6127 21. Look forward to all ongoing and upcoming intergovernmental processes
6128 which will contribute to the implementation of the 2030 Agenda, including, inter alia, the
6129 United Nations Conference on Housing and Sustainable Urban Development (Habitat III), to
6130 be held in Quito in October 2016; the United Nations high-level plenary meeting on
6131 addressing large movements of refugees and migrants, to be held in New York in September
6132 2016; the thirteenth meeting of the Conference of the Parties of the Convention on
6133 Biological Diversity, to be held in Cancun, Mexico, in December 2016; and the Group of 20
6134 Summit to be held in Hangzhou, China, in September 2016. We recommend that these
6135 processes and other efforts, including, inter alia, the Sendai Framework for Disaster Risk
6136 Reduction 2015-2030 and the 10-year Framework of Programmes on Sustainable
6137 Consumption and Production Patterns, should focus on ensuring that no one is left behind.
6138 We stress the importance of system-wide strategic planning, implementation and reporting
6139 in order to ensure coherent and integrated support for the effective implementation of the
6140 2030 Agenda by the United Nations development system, taking into account its integrated
6141 and indivisible nature;

6142 22. Endorse the outcome of the process of consultation on the scope,
6143 methodology and frequency of the Global Sustainable Development Report as well as its
6144 relationship with the Sustainable Development Goals progress report, as laid out in the
6145 annex to the present declaration;

6146 23. Are encouraged, despite varied new challenges emerging after the adoption
6147 of the 2030 Agenda, by the enthusiasm, innovation and dedication of the wide array of
6148 actors already engaged, in collaborative partnerships, in its implementation, showing that
6149 this is an Agenda of the peoples, by the peoples and for the peoples. In this regard, we look

6150 forward to its continued inclusive implementation and urge that every effort be made to
6151 reach the furthest behind first and to ensure that no one is left behind.

6152 [ANNEX on Global Sustainable Development Report: scope, frequency, methodology and](#)
6153 [relationship with the Sustainable Development Goals progress report](#)

6154 We, the Ministers and high representatives, having met at United Nations Headquarters in
6155 New York,

6156 Scope

6157 Recalling paragraph 83 of the 2030 Agenda for Sustainable Development,

6158 1. Stress that the Global Sustainable Development Report is one important
6159 component of the follow-up and review process for the 2030 Agenda for Sustainable
6160 Development;

6161 2. Also stress that the Global Sustainable Development Report will inform the
6162 high-level political forum, and shall strengthen the science-policy interface and provide a
6163 strong evidence-based instrument to support policymakers in promoting poverty
6164 eradication and sustainable development. It will be available for a wide range of
6165 stakeholders, including business and civil society as well as the wider public;

6166 3. Resolve that the Report should incorporate scientific evidence in a
6167 multidisciplinary manner, considering all three dimensions of sustainable development, in
6168 order to reflect the universal, indivisible and integrated nature of the 2030 Agenda. With its
6169 universal scope, the Report should also consider the regional dimension, as well as countries
6170 in special situations. The Report will provide guidance on the state of global sustainable
6171 development from a scientific perspective, which will help address the implementation of
6172 the 2030 Agenda, provide lessons learned, while focusing on challenges, address new and
6173 emerging issues, and highlight emerging trends and actions. The Report should also focus on
6174 an integrated approach and examine policy options with a view to sustaining the balance
6175 between the three dimensions of sustainable development. These policy options should be
6176 in line with the 2030 Agenda to inform its implementation;

6177 Frequency

6178 4. Resolve that a comprehensive, in-depth Report will be produced every four
6179 years to inform the high-level political forum convened under the auspices of the General
6180 Assembly;

6181 5. Also resolve that each year, in order to strengthen the science-policy
6182 interface at the high-level political forum convened under the auspices of the Economic and
6183 Social Council, scientists who work on the Report should be invited to provide scientific
6184 input into the discussion, including on the theme of the forum;

6185 Methodology

6186 6. Stress that the main principles guiding the methodology of the Report should
6187 be objectivity, independence, transparency, inclusiveness, diversity, scientific excellence and
6188 integrity, and policy relevance. The Report represents the result of an ongoing dialogue
6189 among scientists in all relevant fields on sustainable development worldwide, ensuring
6190 geographically balanced participation and assessing existing assessments, including the
6191 relevant reports on sustainable development from a variety of sources, including the United
6192 Nations system, as well as bringing together dispersed information;

6193 7. Request, therefore, the creation of an independent group of scientists to
6194 draft the quadrennial Global Sustainable Development Report. The independent group of
6195 scientists is to comprise 15 experts representing a variety of backgrounds, scientific
6196 disciplines and institutions, ensuring geographical and gender balance. The group will be
6197 appointed for each Global Sustainable Development Report by the Secretary-General in
6198 open, transparent and inclusive consultations with Member States, including the possibility
6199 of taking nominations from Member States. The group will commence its work by the end of
6200 2016. It will be supported by a task team, co-chaired by one representative each of the
6201 United Nations Secretariat, the United Nations Educational, Scientific and Cultural
6202 Organization, the United Nations Environment Programme, the United Nations
6203 Development Programme, the United Nations Conference on Trade and Development and
6204 the World Bank, with the logistical support of the United Nations Secretariat. The task team
6205 will coordinate inputs from a network of existing networks, representing the United Nations,
6206 the private sector, civil society and academia. Inputs can also be posted onto the high-level
6207 political forum online platform annually;

6208 Relationship with the Sustainable Development Goals progress report

6209 8. Acknowledge the distinct but complementary nature of the Sustainable
6210 Development Goals progress report and the Global Sustainable Development Report, both
6211 contributing to the high-level political forum from different perspectives. The high-level
6212 political forum will be informed by the annual Sustainable Development Goals progress
6213 report, which is to be prepared by the Secretary-General in cooperation with the United
6214 Nations system, on the basis of the global indicator framework, data produced by national
6215 statistical systems and information collected at the regional level. The Global Sustainable
6216 Development Report will be more scientific and analytical, focused on the science-policy
6217 interface, and will also inform the high-level political forum.

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6220 **ANNEX 5: Acknowledgments**

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6222 **(THIS SECTION WILL BE UPDATED AND EXPANDED IN ADVANCE OF FINAL PUBLICATION)**

6223 Many people contributed their time, expertise, experience, and dedication to make this
6224 report possible. The United Nations Task Team, coordinated by the United Nations
6225 Department of Economic and Social Affairs, provided substantive inputs and organizational
6226 support to the Independent Group of Scientists (IGS) throughout the Group's tenure.
6227 Colleagues from the IGS members' institutions also provided crucial support to the research
6228 and preparation of the report as well as to the outreach and dissemination efforts. A call for
6229 inputs yielded valuable contributions from scholars and practitioners from around the globe,
6230 and participants in the regional consultations also provided important insights. The IGS would
6231 like to gratefully acknowledge the following organizations and individuals.

6232

6233 United Nations Task Team **(to be completed)**

6234 Independent Group of Scientists' member institutions **(to be completed)**

6235 Additional expert contributors **(to be completed)**

6236 Participants in the regional consultations **(to be completed)**

6237 Contributors to the Call for Inputs **(to be completed)**

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¹ **United Nations Department of Economic and Social Affairs.** 2015. *Transforming our world: the 2030 Agenda for Sustainable Development*, <https://sdgs.un.org/2030agenda>

² It has been 35 years now since the ground-breaking Report of the World Commission on Environment and Development, *Our Common Future*, was published under the leadership of Chair, Gro Harlem Brundtland. The Report offered a global agenda for change calling for 'sustainable development' that meets the needs of the present without compromising the ability of future generations to meet their own needs

³ **United Nations.** 2023b. *Progress towards the Sustainable Development Goals: Towards a Rescue Plan for People and Planet - Report of the Secretary-General (Special Edition)*. New York, United Nations.

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