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SDGS FOR ALL: STRATEGIC SCENARIOS

EARTH4ALL SYSTEM DYNAMICS MODELLING OF SDG PROGRESS

Working Paper version 1.0

Earth 4All

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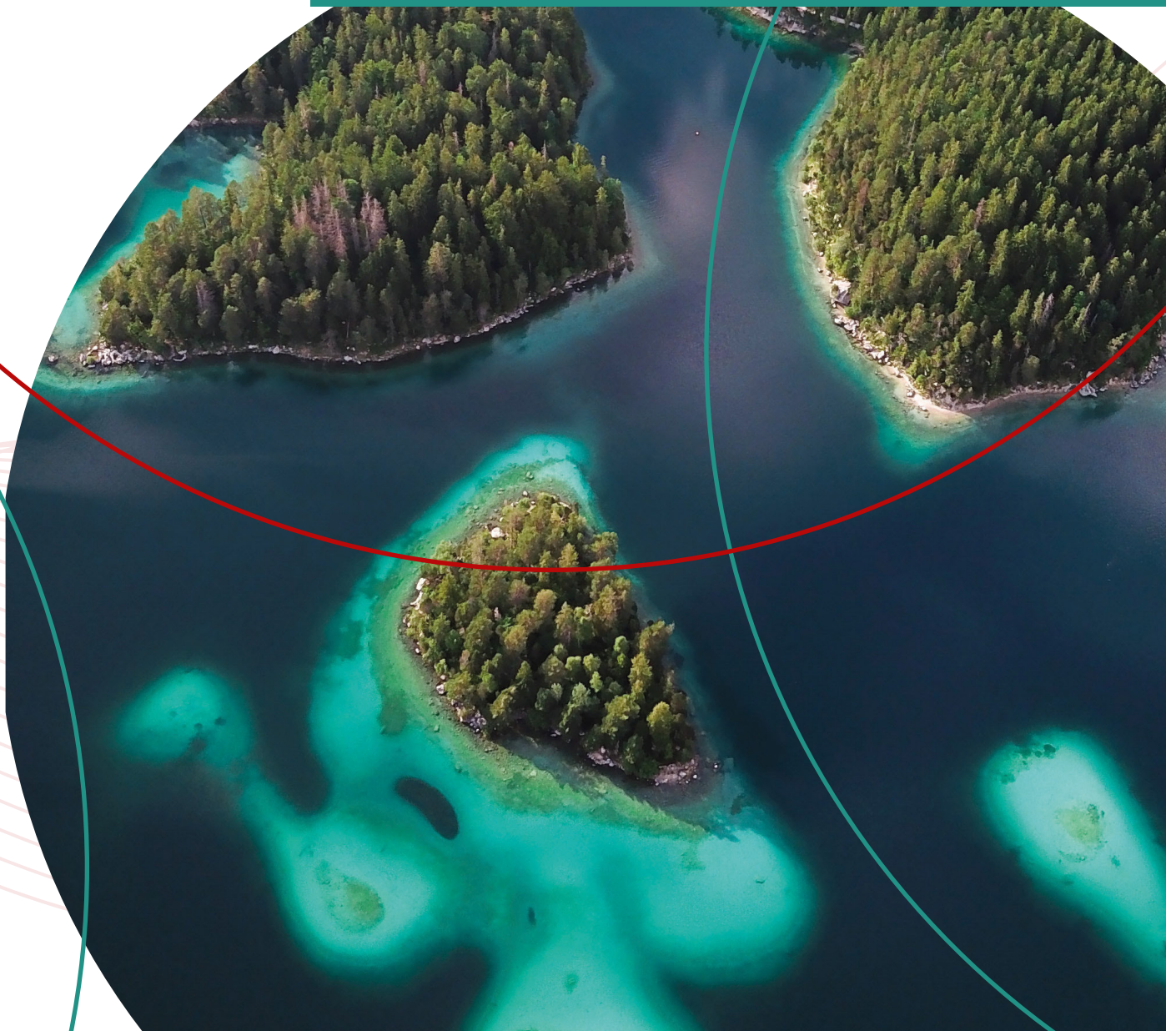

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SDGs for All **Version 1.0**

This is a fast-track report produced by Earth4All for the 2023 United Nations SDG Summit. Work on the SDG modelling and analysis began in May 2023. While all efforts have been made to maintain the highest quality and minimise errors, given the fast-track nature, our review process will continue beyond this initial publication. The document is live and will undergo further changes before final publication in October 2023.

EXECUTIVE SUMMARY

Wellbeing for all human populations can be achieved while respecting planetary boundaries. It will take a Giant Leap – notably five extraordinary turnarounds implemented simultaneously and immediately, in relation to poverty, inequality, empowerment, food and energy. Without these actions, we will condemn future generations to a dangerously destabilised planet; within a few decades the climate system is likely to cross multiple tipping points and social tensions are likely to increase.

EXECUTIVE SUMMARY

About the SDGs for All report

The *SDGs for All* report was written by Earth4All, a vibrant collective of leading economic thinkers, scientists and changemakers convened by The Club of Rome, BI Norwegian Business School, the Potsdam Institute for Climate Impact Research, and the Stockholm Resilience Centre. *SDGs for All* equips policymakers with solutions designed to accelerate SDG implementation and to respond to the planetary emergency.

This report is not only a direct response to the call of the United Nations Secretary-General António Guterres for more rigorous strategic analysis and foresight to support policymaking. It also responds to the Secretary-General's call for climate action as the 21st century's greatest opportunity to drive forward all the SDGs.[1] Taken together, the Earth4All modelling outputs and deep insights combined with our policy proposals provide the basis for structured emergency plans that enable and even strengthen SDG implementation. At the same time, they ensure a just response to today's triple planetary crisis: climate disruption; nature and biodiversity loss; and pollution and waste.[2]

With our new SDGs for All report, we examine SDG progress in the light of Earth4All's five extraordinary turnarounds – poverty, inequality, empowerment, food and energy – and against the scenarios that lie at the core of the Earth4All model:

- **Too Little Too Late:** our "decision-making-as-usual" scenario where societies maintain the types of economic policies that have been in place for 40 years. While incremental progress will be made on some SDGs, this scenario will continue to drive inequality, unsustainable consumption and climate catastrophe.
- **Giant Leap:** a scenario where societies make ambitious decisions and investments today through Earth4All's five extraordinary turnarounds, which collectively enhance social cohesion, build trust and establish a new social contract between people and the state.

We also consider SDG progress when each extraordinary turnaround is taken alone, as opposed to simultaneously in the Giant Leap.

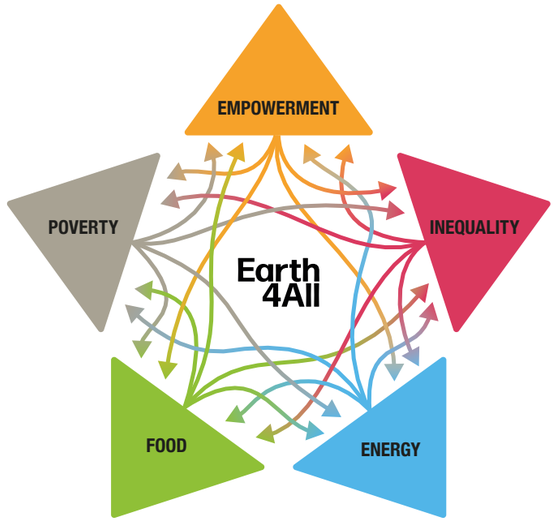
[1] https://sdgs.un.org/climate-sdgs-synergies
[2] https://press.un.org/en/2022/sgsm21243.doc.htm

About the Earth4All system dynamic model

The *SDGs for All* report applies the unique Earth4All system dynamics model, future scenarios and recommended pathways for change, which were developed for the 2022 book *Earth for All: A Survival Guide for Humanity*. The book and programme of work were launched as a 50-year follow-up to *The Limits to Growth* (1972).

In *The Limits to Growth*, the authors argued that Earth's finite natural resources could not support ever-increasing consumption, and warned of likely ecological overshoot and societal collapse if the world did not recognise the environmental costs of unlimited exponential growth in resource use and waste on a finite planet. Today, scientists conclude that we are exceeding six of the nine planetary boundaries, as a result of this growth. Climate tipping points, once considered a distant risk, may be crossed within a few decades. We cannot rule out that some climate tipping points may have already been crossed.

It is against that backdrop that we ran an extensive system dynamic modelling exercise and then ensured proper stress testing by the Earth4All Transformational Economics Commission (consisting of economic thinkers and scientists from across the globe). The three-year process, combined with deep thinking by the partners around a well-grounded yet hopeful narrative, resulted in *Earth for All: A Survival Guide for Humanity*. The central conclusion, which is extremely pertinent for the SDGs, is that wellbeing for all can be achieved while respecting planetary boundaries, but only if five extraordinary turnarounds are implemented simultaneously for poverty, inequality, empowerment, food and energy.



Transform and accelerate human development in **LOW-INCOME COUNTRIES** by reforming the international financial and trade system.

Transform **WEALTH DISTRIBUTION** by ensuring the wealthiest 10% have no more than 40% of national income.

Transform gender power imbalances: **EMPOWER WOMEN** and invest in education for all.

Transform agriculture: the **FOOD SYSTEM** must become regenerative and nature positive.

Transform **ENERGY SYSTEMS** to halve emissions of greenhouse gases every decade.

The urgency of the Earth4All turnarounds

Applying these five extraordinary turnarounds will require governments to take unprecedented measures to transform economies in order to enable widespread increases in human welfare within Earth's natural boundaries.[3] It will also require massive acceleration in the scale and speed of transformative change if we are to rise to the growing existential threats to humanity and the planet from predicted future shocks and stresses.

Evidence of these threats has never been more terrifying. This summer, climate emergencies have been declared in over 2,300 jurisdictions and local governments in 40 countries, impacting over 1 billion citizens.[4] Now more than ever, the words of Pope Francis from 2015 ring particularly true, namely the world is on a suicide path on climate change.[5] More recently, Guterres called upon all countries to declare a state of climate emergency until the world has reached net-zero CO2 emissions.[6]

Our proximity to so many tipping points is undeniable. If we do not take action, we face an unthinkable default option of "environmental devastation, extreme economic disparities and fragilities, and potentially unbearable social and political tensions".[7] In this report, we identify the myriad of solutions under the Giant Leap scenario. It provides us with a pathway forward – a pathway of hope – but it also reinforces that time is of the essence.

A note about the methodology of the SDGs for All report

In this report, we have clustered the 17 SDGs around the five extraordinary turnarounds. The inequality and empowerment turnarounds are considered jointly because of their particular synergies. The choice of which SDGs to include in separate clusters is based on those combinations of SDGs that are particularly synergistic and which closely relate to particular turnarounds. By clustering the SDGs in this way, we also explore dependencies and potential trade-offs between these goals.

It is important to note that the Earth4All model was not originally developed to assess the SDGs but was specifically designed to answer the overarching research question: How can we maximise human wellbeing within planetary boundaries to 2100? Because of the architecture of the Earth4All model, we only used one indicator per SDG, chosen based on the indicators already contained in our model and that could easily fit with the model's structure. Together, they are to reflect the overarching challenge of the 2030 Agenda. The detailed results of the modelling are presented in Chapter III of the report. We provide a snapshot below.[8]

Key findings from the SDGs for All report

Finding 1 – The Giant Leap delivers concrete wins for many of the SDGs

Because of the architecture of the Earth4All model, we have modelled single indicators for a relevant cluster of SDGs. Further granularity and indicators will be applied in the next phase of this project when macro regions and nation states are analysed against the Too Little Too Late and the Giant Leap scenarios. Nevertheless, this present work has already generated important insights, which reinforce how much farther the Giant Leap gets us compared with the Too Little Too Late scenario by 2050.

- **We turn poverty around**
  Using the indicator of "population living below US$6.85 per day", we see massive differences between the Too Little Too Late and Giant Leap scenarios.[9] In Too Little Too Late, close to 20% of the global population will continue to live in poverty by 2050. In the Giant Leap scenario, this figure drops steeply to 6.7%. *This translates into 1 billion less people in poverty by 2050*.

- **Wellbeing for all is achieved**
  We measure wellbeing with Earth4All's Average Wellbeing Index, which is based on dignity, natural health, strength of institutions, fairness and equality, and citizen participation. Under Too Little Too Late, wellbeing drops far below 2015 levels, when the SDGs were adopted. By 2050 it

[3] https://www.project-syndicate.org/commentary/club-of-rome-report-sustainable-wellbeing-five-shifts-by-jayati-ghosh-2022-07

[4] http://climateemergencydeclaration.org/climate-emergency-declarations-cover-15-million-citizens/

[5] https://www.washingtonpost.com/news/worldviews/wp/2015/11/30/pope-francis-the-world-is-near-suicide-on-climate-change-its-now-or-never/

[6] https://www.theguardian.com/environment/2020/dec/12/un-secretary-general-all-countries-declare-climate-emergencies-antonio-guterres-climate-ambition-summit

[7] https://www.project-syndicate.org/commentary/club-of-rome-report-sustainable-wellbeing-five-shifts-by-jayati-ghosh-2022-07

[8] A more technical documentation of the model, data sources and indicators can be found in Collste, Spittler, Barbour et al. (2023)

[9] For poverty thresholds, we have used the US$6.85 threshold instead of US$1.90 because it better represents the new international consensus of what it actually takes to escape poverty, as noted by Fanning (2021).

could plummet to historically low levels because of increased poverty, inequality, social tensions and worsened climate change. The good news is that under the Giant Leap scenario, wellbeing soars to historic highs by 2050, far exceeding the highest levels reached in recent history, prior to the financial crash in 2008.

- **Income inequality is massively reduced**
Our chosen indicator of the ratio of owner incomes to worker incomes is particularly relevant because for the first time this century, global real wage growth has become negative, meaning that it is not keeping up with inflation. In 2022, we saw the largest gap recorded since 1999 "between real labour productivity growth and real wage growth in high income countries". This covers a period that includes the most significant economic crises of the 21st century so far.[10]

  Measuring the ratio of owner to worker incomes is also relevant given the deeply concerning North American trends whereby CEO salaries have skyrocketed 1,460% since 1978.[11] In 2021, CEOs were paid 399 times as much as a typical worker. In our Too Little Too Late scenario, income inequality increases, with owners accounting for 75% of incomes and workers for only 25% by 2050. Under the Giant Leap we reach parity with owners and workers each accounting for 50% of incomes by 2050. This has a massive impact for improved standards of living, access to basic human needs, social justice and cohesion.

- **CO2 intensity is lowered to negative levels.** The Giant Leap scenario demonstrates the greatest improvement, with the CO2 intensity of the economy declining rapidly by the 2040s. This indicator highlights the importance of upgrading infrastructure and retrofitting industries to make them more resource-efficient.

- **Emissions per person are also declining rapidly in the Giant Leap scenario.** By 2050, the Giant Leap enables annual per capita drawdown of 0.58 tonnes of carbon, or a total of 5 billion tonnes of carbon globally. This is in stark contrast with the Too Little Too Late scenario, which results in 16.7 billion tonnes of carbon emitted globally in 2050.

- **The steady increase in fertiliser use is reversed**
The global production and use of nitrogen fertiliser for food production accounts for approximately 5% of greenhouse gas emissions. This is why the dramatic decrease in fertiliser use in the Giant Leap is so important for the climate change battle. Reduction in fertiliser use is also key for the transition to more sustainable and responsible food production systems and for restoring the nitrogen cycle. Considered an important planetary boundary, the nitrogen cycle has been dramatically altered by the overloading of ecosystems with nitrogen through the burning of fossil fuels and an increase in nitrogen-producing industrial and agricultural activities. Under the Giant Leap, the global decline in fertiliser use, continues its rapid downward trend towards 2050. It lands at 25 million tonnes per year, representing one quarter of the volume of fertiliser use in the Too Little Too Late scenario, which hovers at 100 million tonnes per year by 2050.

- **Public spending per person increases dramatically.** Government investment in public infrastructure, health, education, electricity and other basic services is directly relevant to the aim of promoting peaceful, fair and inclusive societies. In the Giant Leap scenario, public service spending trends significantly upwards. Compared with 2019 levels of $2,700 per person, by 2050, public spending will increase to $6,000 per person per year. This represents an additional $8.8 trillion spent globally on public services per year, an amount equivalent to twice the GDP of Germany. The Giant Leap is in stark contrast to the Too Little Too Late scenario, where public service spending per person per year only increases to $4,800 by 2050. By way of comparison, India spends almost $1,800 per capita, a stark contrast with Norway, which spends over $30,000 per capita.[12]

Finding 2 – The Giant Leap can only be achieved with simultaneous policy turnarounds

We explored SDG progress on the basis of one extraordinary turnaround at a time and we found that, when taken individually, the turnarounds do not get us anywhere near the Giant Leap trajectory of wellbeing for all within planetary boundaries.

This reinforces the critical point that the Giant Leap for the SDGs can only be attained if we act simultaneously on all five extraordinary turnarounds and operationalise all of the policy interventions that we have identified.

The Giant Leap scenario is the only way out of the current planetary emergency and the only pathway for attaining the majority of SDGs by 2050. If we are to support humanity with a fighting chance to cope with likely future shocks and stresses and to reduce the risk of crossing tipping points, we need to urgently embark on a radical transformation. This entails a shift away from today's extractive economy dominated by GDP growth to wellbeing economies that place a value on people, planet and prosperity. This means pivoting away from growth at all costs to a new growth paradigm, which embraces an economic development fostering prosperity for the many – not just the few – within the planetary boundaries.

[10] https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_862569.pdf

[11] https://www.nytimes.com/2021/04/24/business/ceos-pandemic-compensation.html

[12] https://ourworldindata.org/government-spending#:~:text=In%20India%2C%20the%20government%20spends,30%2C000%20US%20dollars%20(PPP)

Finding 3 – Despite the Giant Leap's hopeful pathways, there are two very important red alerts that emerge from our modelling

RED ALERT 1

The gender gap is 230 years behind schedule

The dire situation of gender inequality in both the scenarios is greatly concerning. Current numbers show that the share of female pre-tax labour income increases from 35% to 40% by 2050 before levelling off and showing no signs of improvement under the Too Little Too Late scenario. Under the Giant Leap scenario, there is only a marginal improvement to 42% by 2050, and only a further 4% increase by 2100. At current rates, it would take approximately 257 years to reduce the overall gender gap, meaning that we are 230 years behind schedule. These numbers need to be a wake-up call for governments to start delivering on the promise of gender equality and ensuring the delivery of the Giant Leap, since gender equality is a key turnaround for creating more resilient and prosperous wellbeing economies.

RED ALERT 2

Climate goals will not be reached under either scenario

The reality of overshooting climate goals in both the Too Little Too Late and Giant Leap scenarios gives serious cause for concern and calls into question the lack of emergency planning to address climate change including growing shocks and stresses. Even with massive emissions reductions, global warming is on track to reach 1.5°C in the early 2030s.[13] It is time to heed the call of Secretary-General António Guterres for all countries to declare a state of climate emergency until the world has reached net-zero CO2 emissions.[14]

Equally important, we need governments to step up their ambition levels at UNFCCC COP28 and agree to:

- fast track our global transition to clean energy and decarbonisation by accelerating fossil energy phase out and fossil energy subsidy repurposing
- support vulnerable communities to adapt
- transform climate finance to support vulnerable communities to rebuild after climate-related disasters.[15]

Finding 4 - The Earth4All turnarounds and their related policy interventions are key

The synergistic effects of the policy interventions that underpin the Giant Leap's five extraordinary turnarounds are crucial for success in accelerating the SDGs and responding to the global planetary emergency. We identify below the most important policy interventions that are further elaborated in the report.

- **Significant new investments are essential** and must be accompanied by massive increases in public spending, along with higher taxation of extremely wealthy individuals and private corporations.

- **We need fundamental reform of the International Monetary Fund's process for allocating Special Drawing Rights (SDRs)** to ensure they reach the countries that need them most. Creating global liquidity with new issuances of SDRs is not enough. Dealing with the sovereign debt overhang is also essential to give low-income countries more fiscal space. Until recently, not a single debt-burdened country has been given any form of relief.

- **Governments must also quickly reverse the steady erosion of workers' rights** and implement new safety nets such as a universal basic dividend (UBD).[16]

- **Governments must massively scale up investment in women and girls** to reverse the huge declines in terms of income, safety, education and health, all of which have been exacerbated by cascading global crises. The world is at a tipping point for women's rights and gender equality.

- **Global food systems must be radically transformed** starting with the repurposing of agricultural subsidies towards supporting low-carbon and regenerative agriculture practices to improve food production efficiency and sustainability. Food supply chains must shift towards localised food production, and farmworker rights must be prioritised and protected.

- **Global energy systems must shift from inefficient fossil energy systems** to a clean and optimised energy system that reduces consumption in high-income countries and enhances greater efficiencies across the global energy system. This will entail global acceleration in the phase out of fossil energy and the repurposing of fossil energy subsidies to guarantee a just transition. All efforts must continue to scale towards a 50% cut in greenhouse gas emissions, net-zero biodiversity loss by 2030 and net-zero carbon by 2050, thereby ensuring sustainable and affordable energy for all.

In conclusion, the Too Little Too Late scenario condemns future generations to a dangerously destabilised planet. The climate system is likely to cross multiple tipping points and social tensions are likely to increase.

By contrast, the Giant Leap scenario significantly reduces this risk, but does not eliminate it. However, social tensions are likely to fall and wellbeing is likely to improve significantly, thereby contributing to greater resilience of societies. We recommend both declaring and then adopting clear planetary emergency plans integrating the five extraordinary turnarounds and implementing the policy recommendations in this report. Collectively this is the greatest insurance plan for humanity to not only survive but eventually thrive. Implementing SDGs for All will ensure an Earth for all.

[13] https://news.stanford.edu/2023/01/30/ai-predicts-global-warming-will-exceed-1-5-degrees-2030s/

[14] https://www.theguardian.com/environment/2020/dec/12/un-secretary-general-all-countries-declare-climate-emergencies-antonio-guterres-climate-ambition-summit

[15] https://www.nature.org/en-us/what-we-do/our-priorities/tackle-climate-change/climate-change-stories/cop-climate-change-conference/#:~:text=Helping%20the%20most%20vulnerable%20communities,rebuild%20after%20climate%2Drelated%20disasters

[16] A UBD is a regular payment given to all in society, usually without means testing, distributed as a dividend of common natural resources from companies who exploit those resources, such as in the oil or gas industries.

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I. INTRODUCTION

The SDGs for All report is by Earth4All, a vibrant collective of leading economic thinkers, scientists, and advocates, convened by The Club of Rome, the BI Norwegian Business School, the Potsdam Institute for Climate Impact Research, and the Stockholm Resilience Centre.

The report equips policymakers with long-term and forward-looking solutions designed to accelerate SDG implementation. As such, it is a direct response to the call of the UN Secretary-General and the UN President of the General Assembly for more rigorous strategic analysis and foresight to underpin transformative policymaking in relation to the 2023 UN SDG Summit and the 2024 UN Summit of the Future.

The SDGs for All report applies the unique Earth4All system dynamics model, future scenarios and recommended pathways for change developed under the ambit of our 2022 report *Earth for All: A Survival Guide for Humanity*, which was launched as a 50-year follow-up to the 1972 *The Limits to Growth* report.

Building on the legacy of *The Limits to Growth* and the planetary boundaries framework, the Earth4All model calculates different scenarios to illustrate how economic policies are likely to affect human wellbeing, societies and ecosystems in the short- and long-term future. The principal messages of the 2022 book are that wellbeing for all can be achieved while respecting planetary boundaries, but only if five extraordinary turnarounds are implemented simultaneously in relation to poverty, inequality, empowerment, food and energy. See Table 1 for an overview of these turnarounds.

With this new *SDGs for All* report, we apply the Earth4All model to examine SDG progress against the two scenarios that lie at the core of *Earth for All: A Survival Guide for Humanity*:

- **Too Little Too Late:** a scenario that explores the path of economic development and unsustainable consumption if societies continue on the same course as the last 40 years.

- **Giant Leap:** a scenario that explores a path where societies make extraordinary decisions and investments today through five extraordinary turnarounds that enhance social cohesion, build trust and establish a new social contract between people and the state.

We also use our Earth4All model to examine how the five extraordinary turnarounds through our Giant Leap scenario can influence SDG progress over the next 20 years. When we explored SDG progress one turnaround at a time, it took us nowhere near the Giant Leap trajectory. This means that we must act on all five extraordinary turnarounds simultaneously at a speed and on a scale never before seen.

It is important to note that this report is based on the Earth4All global model, which was designed to show how different policies are likely to affect human wellbeing, societies and ecosystems in the short and long term. As such, the model was not originally designed for assessing SDG progress – this is the first time we have used it for this purpose. Due to the model's architecture, it was necessary to assess SDG progress on the basis of indicators that were already contained in the model. In other respects, we supplemented indicators by using those included in the official SDGs or other useful proxies.[17] Together with the Millennium Institute[18] we are currently working in parallel on a set of national and regional SDG modelling exercises, which will enable more granularity with further indicators and will help countries to understand the relationship between those indicators specific to their socio-economic and political context.

As we finalised this report in August 2023, heatwaves, wildfires and floods ravaged many parts of the globe, providing a sobering glimpse of an unstable future. Changes in the life-supporting Earth system – once distant threats – are creating a new planetary reality: a destabilised climate system and an increasingly fragile biosphere that will make it increasingly difficult to achieve wellbeing for all.

The Giant Leap scenario is the only way out of the current planetary emergency and the only pathway for attaining the majority of SDGs by 2050. We are already 20 years behind; if we are to give humanity a fighting chance to cope with shocks and stresses and rreduce the risk for future tipping points, we need to urgently embark on a radical transformation to support wellbeing economies and a thriving biosphere.

[17] Sachs et al. (2023). For more details, see Collste, Spittler, Barbour et al. (2023)
[18] https://www.millennium-institute.org/

II. STRUCTURE AND METHODOLOGY OF THE REPORT

Our *SDGs for All* report is organised around the five extraordinary turnarounds

The report is based on the Earth4All model, which considers 40 years of historical data. In this report, we have clustered the 17 SDGs around the five extraordinary turnarounds (poverty, inequality, empowerment, food and energy) that are described in our 2022 book *Earth for All: A Survival Guide for Humanity*. The choice of which SDGs to include in the clusters is based on those combinations of SDGs that closely relate to particular turnarounds. By clustering the SDGs in this way, we also explore dependencies and potential trade-offs between these goals.[19]

The one-indicator approach adopted by the Earth4All partnership builds on the peer-reviewed papers as well as the report to The Club of Rome in 2018: "Transformation is Feasible".[20]

Table 1 provides an overview of the five turnarounds, the SDGs clustered within, indicators used for modelling, and proposed policy levers. Within each extraordinary turnaround, we analyse SDG progress against the two Earth4All scenarios:

- The **Too Little Too Late** scenario is predicated on decision-making as usual. The assumption is that the global economic system continues to be extractive and based on gross domestic product (GDP), and is only slowly reacting to injustices and environmental change by doing too little and too late. As a consequence, the world (and now the biosphere) is driven towards planetary and societal collapse.

- The **Giant Leap** scenario is predicated on the five extraordinary turnarounds and a transformative shift in the current extractive economy towards a wellbeing economy model that ensures wellbeing for all people and the planet.

We also plot SDG progress along specific turnarounds

In addition to the two scenarios, we also plot SDG progress along the lines of the specific turnaround to which it most closely relates. The reason we do this is to demonstrate how even an individual turnaround will deliver more progress than the Too Little Too Late scenario. But in most cases, the turnarounds on an individual basis do not get us to full attainment of the SDGs, nor do they bring humanity into a semi-safe operating space. This is only possible when we combine all five of the turnarounds in the Giant Leap scenario. And even then, we will be inhabiting a planet that could look very different from the one we are on right now.

About our choice of indicators

Another important methodological point to highlight is that we mostly examined SDG progress using indicators that could easily be derived from variables that were already included in the Earth4All model or which could easily be added. For reasons related to the architecture of the model, and because of the limited availability of modellable indicators, we only used one or two indicators per SDG. Each of the 17 SDGs encompasses several targets and indicators, but not all of these indicators were available, nor relevant for the global level of modelling that was originally carried out. Additionally, it should be emphasised that we scoped and designed the Earth4All model to answer a fundamental research question: How can we maximise human wellbeing within planetary boundaries up to 2100? Therefore, indicators were originally selected with this objective in mind.[21]

The Earth4All model was not designed with the objective of assessing SDG progress; nevertheless, we have decided to use it to understand SDG progress up to 2050. No new variables or structures were added to the model indicators, which were not changed for the purposes of this report. However, we

[19] Collste, Spittler, Barbour et al. (2023)
[20] Randers et al. (2018, 2019); Collste et al. (2018, 2021)
[21] Collste, Spittler, Barbour et all. (2023)

have taken great care to select suitable indicators given the 2030 Agenda scope and structure of the model. We have chosen indicators to reflect the dynamics of each individual SDG and the synergies between them. In each of the graphs throughout this report, the y-axis always reflects the indicator. For example, in our electricity access graph, where we use the indicator of percentage of the population having access to electricity, the numbers on the y-axis reflect population percentages. In the next phase of our work, we will be retrofitting the Earth4All model to enable greater granularity with indicators in order to assess macro regions. In parallel, we are cooperating with the Millennium Institute to assess Too Little Too Late and Giant Leap scenarios at the national level.

The parsimony of the Earth4All model

The Earth4All model was designed to capture global trends and generate discussion about high-level trends and scenarios and the commensurate scope of systems change required. As a global model, Earth4All was designed to be big picture, with as few variables and loops as possible. To this end, we designed the model on the principle of parsimony, involving the fewest elements, assumptions or changes.

In long-term and big-picture scenarios, it is important to reduce clutter and the number of variables, drivers, feedback loops, etc. This enables transparency and ease of understanding and, as research confirms, there is next to zero correlation between the number of variables in an economic model and its capacity to forecast economic trends accurately. *The Limits to Growth* is an excellent illustration of the value of a simple model in generating highly accurate insights. Thus our decision to model the SDGs using one indicator per SDG is very much aligned with the parsimonious design of the Earth4All model.[22]

About our thresholds for each indicator

We have plotted threshold lines for each of the indicators that we have modelled, illustrated by dashed lines in each graph. They provide a visual depiction of just how well (or not) an indicator is performing and how close it is to achievement. The green threshold represents the highest level of attainment of the SDG, while the red threshold is a less ambitious target level that represents only partial attainment of the goal. We have based our thresholds on the official thresholds set out in the annual SDG Index and Dashboards Reports,[23] which track the annual progress of all 193 UN Member States towards the SDGs.[24, 25, 26]

We refer to SDG 1 (poverty) to illustrate how the thresholds are used in all of the modelling graphs. In SDG 1, the official goal is expressed as "End poverty in all its forms everywhere" (by 2030). As explained in this methodology section, because of the limitations of the architecture of the Earth4All model, we can only use one to two indicators per SDG to explore potential trends for goal performance up to 2050. So for SDG 1, we use the indicator of "fraction of population living below US$6.85 per person per day". The ambitious green threshold for this indicator is where less than 5% of the population is living below $6.85 per day. We see that even the Giant Leap scenario does not reach this threshold by 2050. And the Too Little Too Late scenario never even reaches the less-ambitious red threshold of 13% of the population living below $6.85 per person per day.

[22] The one-indicator approach also builds on the peer-reviewed paper from the Earth3-project (Transformation is feasible) by Randers et al. (2019).

[23] https://dashboards.sdgindex.org/chapters/methodology

[24] Sachs et al. (2023).

[25] Schmidt-Traub et al. (2017).

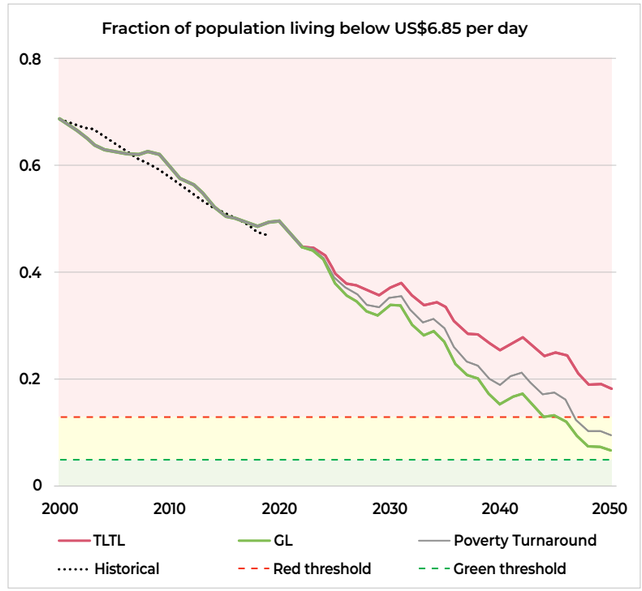
[26] Collste et al. (2018).

How to read the Earth4All model graphs:

Indicators: only one indicator is used per SDG, chosen out of those in our model that best reflects the SDG in question

Trend Lines: four scenarios are modelled; Historical Data (dotted), Too Little Too Late, Giant Leap, and the specific turnaround, e.g. Poverty

Thresholds: green thresholds (dashed) represent highest level of attainment in relation to the actual goal. **The red thresholds** (dashed) demonstrate only partial goal attainment



One last caveat to be emphasised here is that while we recognise the devastating impact of COVID-19 and the other global crises and shocks of the past four years, our long-term projections have been made on the basis of over 40 years of historical data, which themselves have demonstrated steady and consistent trends. It is these trends that ultimately drive the long-term dynamic projections that are produced by the model.

Table 1 presents a summary of the five extraordinary turnarounds under the Giant Leap scenario, along with the clusters of indicators that we have modelled under each turnaround. We have also identified the policy interventions that are essential for the turnarounds and, throughout this report, we have further adapted the original policy interventions from our 2022 book to address the results of our SDG modelling. The results of the modelled indicators for the inequality and empowerment turnarounds have been addressed together because of the important synergies between the policy interventions that are included in these two turnarounds.

Table 1 – The five turnarounds, their SDG clusters and related policy interventions

	Poverty turnaround	Inequality turnaround	Empowerment turnaround	Food turnaround	Energy turnaround
SDGs considered under the turnaround	▸ SDG 1: Poverty ▸ SDG 2: Zero Hunger ▸ SDG 6: Clean Water Sanitation	▸ SDG 3: Good Health and Wellbeing ▸ SDG 4: Quality Education ▸ SDG 5: Gender Equality ▸ SDG 8: Decent Work and Economic Growth ▸ SDG 10: Reduced Inequalities ▸ SDG 16: Peace, Justice and Strong Institutions ▸ SDG 17: Partnership for the Goals[27]		▸ SDG 12: Sustainable Consumption and Production ▸ SDG 14: Life Below Water ▸ SDG 15: Life On Land	▸ SDG 7: Clean Energy ▸ SDG 9: Industry, Innovation and Infrastructure ▸ SDG 11: Sustainable Cities and Communities ▸ SDG 13: Climate Action
Indicators modelled under the turnaround	▸ Fraction of population living below US$6.85/ per day ▸ Prevalence of undernourishment ▸ Safe water access ▸ Safe sanitation access	▸ Average Wellbeing Index ▸ School life expectancy ▸ Female pre-tax labour income share ▸ Worker disposable income ▸ Ratio of owner incomes to worker incomes ▸ Public services per person total (k$/p/y) ▸ Social tension		▸ Fertiliser use (Mt/y) ▸ pH in ocean surface ▸ Expansion of cropland (Mha)	▸ Electricity access ▸ CO2 intensity ▸ Emissions per person ▸ Observed warming °C
Overall aim of the turnaround	GDP growth rate of at least 5% for lower-income countries until GDP per person is greater than $15,000/year.	By 2030, the wealthiest 10% take less than 40% of national income.	Full gender equity in terms of agency, rights, resources and power in both law and employment.	A regenerative, sustainable food system that works for all within planetary boundaries.	Improved energy access for citizens of lower-income countries. Zero emissions by 2040 through low-carbon energy sources and efficiencies.

[27] The inequality and empowerment turnarounds are modelled together, so the same SDGs are examined.

	Poverty turnaround	Inequality turnaround	Empowerment turnaround	Food turnaround	Energy turnaround
Call to action in the turnaround	Reform of the international financial system and trade regulations to support lower-income countries – reducing multidimensional poverty and enabling sustainable economic progress for all.	Governments should increase taxes (income and wealth) on the wealthiest 10% in societies until they take less than 40% of national incomes.	Empower women and others disadvantaged in current systems to have equal access to education, economic and social rights, power and assets by 2030 – stabilising the world's population immediately and unleashing the potential of all.	Transform the food system towards regenerative and sustainable agriculture. Enhance locally grown and healthy diets without destroying the planet – halting biodiversity loss and protecting the global commons to ensure food for all.	Transform our inefficient fossil energy system to a clean and optimised energy-efficient system, reaching a 50% cut in greenhouse gas emissions by 2030 and net-zero fossil carbon and biodiversity loss by 2050 – thereby ensuring access to sustainable energy for all.
Policy interventions needed to activate the turnaround	▸ Expand the fiscal space of lower-income countries. ▸ Transform the current global financial architecture to expedited debt relief and improve allocation of Special Drawing Rights (SDRs). ▸ Transform global trade dependencies to reduce trade deficits in low-income countries. ▸ Improve access to knowledge, technology and leapfrogging. ▸ Develop new economic indicators.	▸ Stronger progressive taxation on both income and wealth for individuals and corporations. ▸ Strengthened labour rights and trade unions' negotiating power. ▸ Safety nets and innovation nets to share prosperity and provide security, such as the universal basic dividend (UBD).	▸ Recognise that gender equality is a fundamental right and an essential precondition for economic prosperity and social cohesion. ▸ Massively scale up investment to meet 2030 education targets and guarantee the right to education for women and girls. ▸ Ensure gender equality in leadership positions in public and private bodies. ▸ Guarantee universal social protection and adequate universal pension systems.	▸ Remove perverse agricultural subsidies. ▸ Food production must shift from industrial to sustainable and regenerative agriculture practices. ▸ Localised consumption, food sovereignty, and farmworker rights must be prioritised and protected. ▸ Efficiency must be improved across the supply chain.	▸ Investment in renewables and efficiency must be tripled. ▸ Climate financing must be provided as concessional grants and not as loans. ▸ Make renewable energy affordable by redirecting fossil fuel subsidies. ▸ Support a global price on carbon and guarantee access to clean, safe and affordable energy for all.

III. OVERARCHING FINDINGS OF THE SDGs FOR ALL REPORT

1. POVERTY TURNAROUND

In our 2022 book *Earth for All: A Survival Guide for Humanity*, the long-term goal of the poverty turnaround is to achieve a GDP growth rate of at least 5% for lower-income countries until GDP per person has reached $15,000/year.

In the Earth4All model, the poverty turnaround is predicated on the reform of the international financial system and trade regulations to support lower-income countries from 2022 – thus reducing multidimensional poverty and enabling sustainable economic progress for all in the long term. Under the poverty turnaround, we examine progress with regard to three SDGs: no poverty (SDG 1), zero hunger (SDG 2) and safe water access and safe sanitation access (SDG 6). To illustrate progress related to the three SDGs that we examine under the poverty turnaround, we use the following indicators: fraction of people living below $6.85 per day; prevalence of undernourishment; and access to safe water and sanitation. These are simulated with the Earth4All model and are presented in the graphs below.

In addition to presenting findings for the three SDGs examined under the ambit of the poverty turnaround, we also examine several of the essential policy interventions for achieving the poverty turnaround in lower-income countries. The interventions contained in *Earth for All: A Survival Guide for Humanity* are:

- Expand the fiscal space of lower-income countries and new mechanisms for redistributing wealth and resources within societies
- Transform the global financial architecture
- Transform global trade
- Improve access to technology enabling leapfrogging
- Develop new indicators of wealth.

We have not described every single intervention in this version 1.0 of our working paper. Rather, we have focused on bridging the financing gap, reforming the allocation process for Special Drawing Rights (SDRs), providing urgent debt relief and transforming the global financial architecture. These interventions have been adapted to the results of the modelling for the indicators under the poverty turnaround. In addition, the image below provides an overview of the poverty turnaround in its entirety.

Goal: GDP growth rate of at least 5% for lower-income countries until GDP per person is greater than $15,000/year.

POLICY INTERVENTIONS

1. Expand the fiscal space of lower-income countries
2. Transform the current global financial architecture to expediated debt relief and improve allocation of special drawing rights (SDRs)
3. Transform global trade dependencies to reduce trade defecits in low-income countries
4. Improve access to knowledge, technology and leapfrogging
5. Develop new economic indicators

SDGs ADDRESSED

Fraction of population living below $6.85 per day

Prevalence of undernourishment

Safe water access
Safe sanitation access

1.1. Earth4All modelling results for the poverty turnaround

Scenario outcomes for fraction of population living below $6.85 per day

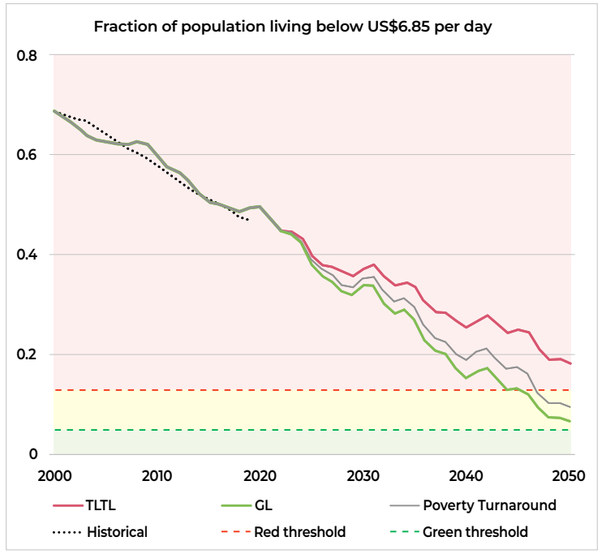
Scenario outcomes for fraction of population living below $6.85 per day
This indicator looks at the fraction of the population living below the poverty line of US$6.85 per day. The red threshold is 0.13 (i.e. 13% of the global population living below the poverty line). The green threshold is 0.05 (i.e. 5% of the global population living below the poverty line).

Too Little Too Late

The Too Little Too Late trajectory declines steadily until 2050 but does not reach either of the thresholds for this indicator. The result is that in 2050 almost 20% of the world population continues to live below the poverty line.

Giant Leap
The fraction of the population living below $6.85/day declines steeply from 2020 to 2050. By 2050, only 6.7% of the world population lives below the poverty threshold. 6.7% translates to 1 billion fewer people living below $6.85/person/day than in the Too Little Too Late scenario.

Earth4All indicator for Poverty (SDG 1)



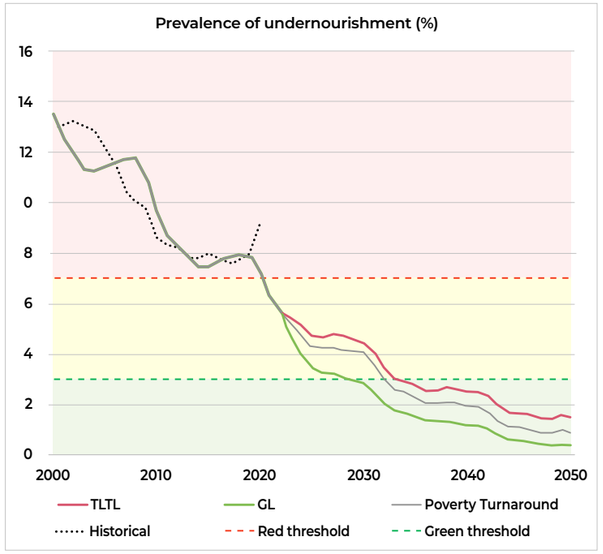
Key insights
Between 2020 and 2030, the observable difference between the Too Little Too Late and Giant Leap scenarios is relatively small. However, by 2040, we see a very significant differential between the scenarios, which continues in its spread until 2050. The steep decrease in poverty in the Giant Leap results from the time lag that is inherent in policy change processes, notably the period from adoption to full operationalisation.

As reflected in the graph, only the Giant Leap gets us close to the green threshold of the goal, whereas Too Little Too Late does not even reach the red threshold. This is because in the Too Little Too Late scenario, governments are unable to mobilise domestic resources for poverty reduction. In low-income countries this is due to massive levels of debt and exorbitant debt service payments, which divert resources away from poverty reduction. Equally important are the global policy levers of debt relief, which are provided under the International Monetary Fund (IMF). Currently, not a single country that has requested debt treatment has been provided with any form of debt relief.

The graph shows that it will take approximately 17 years (from 2023 to 2040) for the Giant Leap's five turnarounds to become operationalised. Once the five turnarounds are in place, poverty numbers in the Giant Leap scenario continue to drop quickly to 6.7%.

The simultaneous implementation of the turnarounds is particularly important for this indicator because of the multidimensional nature of poverty, especially the importance of addressing the climate implications of poverty reduction efforts. Reduced poverty levels will translate into more equitable societies, greater social cohesion, less violent conflict and greater resilience to new shocks and risks.

Earth4All indicator for Hunger (SDG 2)



Scenario outcomes for prevalence of undernourishment

Too Little Too Late

The prevalence of undernourishment trends downwards from 2019 levels of 9.3%. The Too Little Too Late and the poverty turnaround scenarios reach the green threshold of the goal, but much later than the Giant Leap. By 2050 about 1.5% of the population remains undernourished in Too Little Too Late, as compared with current 2020 levels of 9%.

Giant Leap

The prevalence of undernourishment continues to drop steadily, with only 0.4% of the population remaining undernourished by 2050. In the Giant Leap scenario, we reach the green threshold of the indicator – namely the point where less than 3% of the global population is undernourished – in 2030. This means that we will halve hunger as compared with levels in 2022. By 2050, in the Giant Leap, the number of people undernourished in the world is 30 million, as opposed to 130 million in the Too Little Too Late scenario.[28]

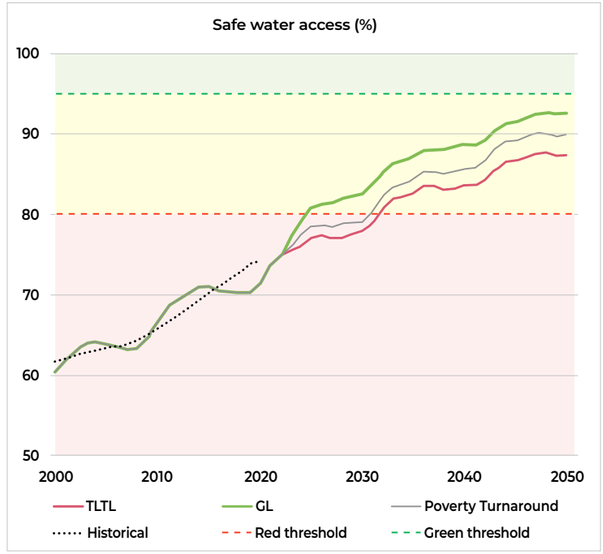
Key insights

The 1.1% difference between the Too Little Too Late and Giant Leap scenarios may seem small at first glance. But when we translate that percentage difference into absolute numbers, this means that, by 2050, the Giant Leap succeeds in lifting 100 million more people out of hunger than Too Little Too Late. This is roughly the equivalent of the population of the Philippines.

The difference in the results between the two scenarios has significant consequences because hunger and malnutrition have massive ripple effects that slow all aspects of development. Reducing hunger has particular health consequences, notably lower levels of child and maternal malnutrition, but also contributes to progress in education and employment. More children will be able to attend schools and adults will have increased capacity to earn more and improve livelihoods.

[28] This is also due to the fact that the scenarios result in different population growth rates. This relates to the inherent dynamics in the Earth4All model. In the Earth4All model, population is not taken as an input to the model but is understood as a consequence of policy choices relating to, among other things, educational outcomes, public investments and environmental change (see further details in the population report by Callegari & Stoknes, 2023). For example, by 2050, the global population will reach 8.8 billion people resulting from the Too Little Too Late scenario and 8.5 billion people resulting from the Giant Leap.

Earth4All indicator for Clean Water and Sanitation (SDG 6)



Scenario outcomes for safe water access

Too Little Too Late

By 2050, 87% of the population has access to safe water, compared with 2020 levels of 74%.

Giant Leap

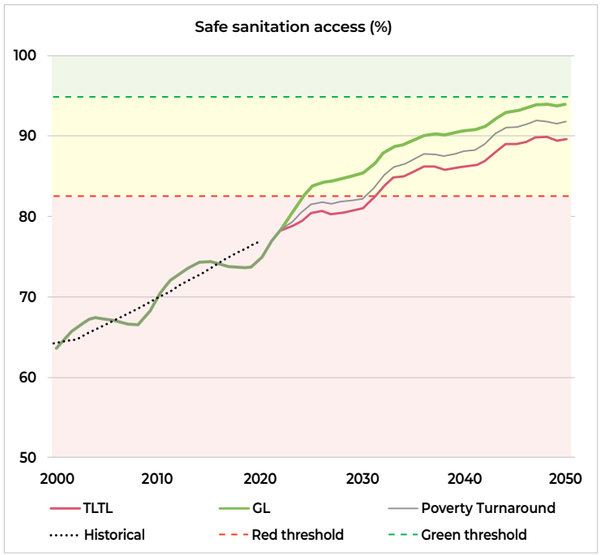
Between 2020 and 2050, the percentage of the population with access to safe water improves significantly, and 93% of the population has access to safe water by 2050 – an increase of 6 percentage points compared with the Too Little Too Late scenario.

Key insights

Both the Too Little Too Late and Giant Leap scenarios surpass the red threshold of over 80% of the population having access to safe water by 2030. However, from 2030 to 2050, the differential between the two scenarios increases.

The difference between the two scenarios appears small in percentage terms but in numerical terms it is significant, representing over 250 million more people who will have access to safe water in 2050. The 6 percentage-point difference will also have massive consequences for our ability to tackle other global crises, including food and climate, and especially the transition to regenerative agriculture.

Earth4All indicator for Clean Water and Sanitation (SDG 6)



Scenario outcomes for safe sanitation access

Too Little Too Late
80% of the population has access to safe sanitation by 2050, as compared with only 54% in 2020.

Giant Leap
Safe sanitation continues to become more accessible. 88% of the population has access to safe sanitation by 2050, i.e. 8% more than in the Too Little Too Late scenario.

Key insights
As with safe water, the difference between the two scenarios is in the single digits (in this case 8 percentage points). Both the Too Little Too Late and the Giant Leap scenarios fail to reach the green threshold, in which 90% of the population has access to safe sanitation.

However, the Giant Leap brings us closest to this threshold, where just below 90% of the population has access by 2050, as opposed to just below 80% in Too Little Too Late. Once again, the 8 percentage-point differential has global ramifications since it translates into nearly half a billion more people who will have gained access to safe sanitation. This figure is comparable to the entire population of the EU, which in 2023 was estimated at 448 million inhabitants.

Lack of access to sanitation has enormous health burdens and economic costs, which are disproportionately borne by the world's poorest and most vulnerable, especially women and girls. Climate change will only make access to water and sanitation more difficult and costly, which is why every percentile matters.

1.2. The policy interventions needed for the poverty turnaround

In this section, we highlight the specific policy interventions that are necessary to achieve the three SDGs that we cluster in the poverty turnaround. As with all the other turnarounds, these policy interventions are deeply interconnected and must be implemented together in order to optimise their inherent synergies.

The three most urgent interventions for turning poverty around are:

- Governments must definitively bridge the financing divide. Overseas development assistance (ODA) must be massively scaled up so that it actually matches the real need on the ground.

- The process for issuance and allocation of Special Drawing Rights (SDRs) must be reformed by the IMF, especially because of their potential to free up much-needed fiscal space for low-income countries to finance SDGs.

- The international community must urgently scale up debt relief efforts. Debt relief is absolutely critical and urgent because of the record number of indebted countries that are either in or near debt default, and equally because they are paying exorbitant debt service payments that are crushing their ability to provide basic human needs to their populations.

Governments must definitively bridge the financing divide

The solution for unlocking finance and bridging the ever-growing financing divide for the poverty turnaround is actually very simple. Governments have to honour the financing commitments that were made over 40 years ago but continue to be unmet. In 2022, high-income countries only mobilised $204 billion in ODA, which represented a mere 5% of the annual needs of low-income countries. If governments can match their fire power in mobilising the trillions that they were able to find to address COVID-19, the war in Ukraine and recent banking failures, we can potentially bridge the financing divide. However, this will require efforts not just by the public sector but also a massive increase in private investment to the right sectors and the geographies that need investment most urgently. For example, when it comes to ensuring universal access to water, overall investments must be quadrupled.[29]

At the same time, it is critical that private investment is massively scaled up towards improving water infrastructure, especially in those countries that are fraught with droughts and floods.[30] Moreover, even though access to education is addressed in the empowerment turnaround, it is worth noting here that alongside broken ODA promises, lack of funding for education is actually part of a larger systemic economic challenge. For example, due to decades of World Bank austerity measures, indebted countries have been required to divert domestic resources away from education and other basic human needs in order to service loan payments. This continues to be the case today where the debt service payments of the world's poorest countries represent 10.3% of their export of goods and services and 1.8% of their gross national product.[31]

The process for issuance/allocation of Special Drawing Rights (SDRs) must be transformed

Governed by the IMF quota system, SDRs are not fairly allocated and have not yet reached countries most in need. We recognise that the 2021 SDR issuance of $650 billion was the largest in the IMF's history. However, approximately two thirds of the SDRs went to high-income countries because SDR allocation is undertaken on the basis of the IMF quota system as

[29] https://www.who.int/news/item/24-10-2022-universal-access-to-safe-drinking-water-requires-increased-investment-backed-by-strong-government-institutions--who--unicef--world-bank

[30] https://www.weforum.org/agenda/2022/08/access-clean-water-inequality-financing/

[31] https://www.worldbank.org/en/news/press-release/2022/12/06/debt-service-payments-put-biggest-squeeze-on-poor-countries-since-2000

opposed to actual need. There has been no reform of the governance of the IMF since the institution was established in 1945. Its decision-making processes must be radically overhauled if resources are to flow equitably to those countries that need them most.

Another complicating factor related to the SDRs that must be urgently addressed is the slow and cumbersome process of the two IMF trust funds – the Poverty Reduction and Growth Trust and the Resilience and Sustainability Trust – through which recycled SDRs are meant to be channelled. It is important to recall that in 2021, high-income countries agreed to reallocate 30% of their SDRs to low- and middle-income countries (totalling $100 billion). However, not only has it taken over two years for high-income countries to actually honour their SDR recycling commitments, but the reality on the ground is that neither of these two trust funds has disbursed any recycled SDRs. This situation must be reversed urgently, especially since the whole premise of SDRs is to provide urgent liquidity to low-income countries. If it takes this long to increase the fiscal space of low-income countries, they will be driven deeper and deeper into debt, from which they might never be able to escape.

The international community must urgently scale up debt relief efforts

In order to avoid another lost decade of development, as a critical step, the international community must urgently reform the Debt Service Suspension Initiative and the Common Framework for Debt Treatment to ensure that countries' requests for treatment are met and that debt treatment is equally available to highly indebted middle-income countries. In 2021, 26 low-income nations individually paid more to service debts than they actually received in climate finance. Instead of agreeing to cancel partial debt, many big banks and hedge funds continue to insist on being paid in full, including the high interest payments. This is driving an unprecedented number of indebted countries into a downward poverty spiral, which will take decades from which to emerge.

The June 2023 Paris Summit on the Global Financing Pact highlighted just how low the appetite is among high-income countries and private sector creditors to reform the debt architecture, which until only recently has not granted any requests for debt treatment. This has to change urgently and the forthcoming annual meetings of the World Bank and the IMF must take bold steps to reform the inequitable and inefficient international debt architecture, not to mention the larger systemic inequalities in the global financial system that continue to be inadequately addressed – both by the World Bank and the IMF, as well as the recent G7 meeting in Hiroshima and the Paris Summit. They have all failed to embrace a reform path to ensure that the unaccountable, undemocratic international financial system is retrofitted for a world that is very different from the one in which it was first created. Reform of the international financial architecture is highly relevant for the poverty turnaround because today's flawed architecture is blocking resources to the low-income and vulnerable countries that need them most.

2. INEQUALITY AND EMPOWERMENT TURNAROUNDS

As mentioned in the methodology chapter of this report, we have combined the inequality and empowerment turnarounds because of the inherent synergies in their respective policy levers and also because, taken together, these turnarounds improve human wellbeing and create more just, cohesive and equitable societies.

The inequality turnaround's main goal is that, by 2030, the wealthiest 10% will take less than 40% of national income (today the ratio is around 60% or more in most countries). The empowerment turnaround is predicated on the goal of full gender equity in terms of agency, rights, resources and power in both law and employment.

We illustrate the systemic nature of the inequality and empowerment turnarounds by providing insights from the modelling of a representative sample of indicators for the SDGs that are clustered under these two turnarounds: Earth4All's composite Wellbeing Index (SDG 3); school life expectancy (SDG 4); percentage of pre-tax labour income owned by women (SDG 5); workers' disposable income (SDG 8); ratio of owner incomes to worker incomes (SDG 10); public services per capita (SDG 16); and social tension (SDG 17).

In addition to presenting findings for the indicators that are examined under the ambit of these turnarounds, we also discuss the essential policy interventions for achieving them: stronger progressive taxation; strengthened labour rights; safety nets; recognition of importance of gender equality for economic prosperity; scaled-up investment for education; gender equality in leadership; and universal social protection. These policy interventions are drawn from the 2022 Earth for All book but adapted specifically to the modelling results of the key indicators.

INEQUALITY TURNAROUND

Goal: By 2030, the wealthiest 10% take less than 40% of notionl income

POLICY INTERVENTIONS

1. Stronger progressive taxation on both income and wealth for individuals and corporations
2. Strengthened labour rights and trade union gegotiating power
3. Safety nets and innovation nets to share prosperity and provide security, such as the universal basic dividend

EMPOWERMENT TURNAROUND

Goal: Full gender equity in terms of agency, rights, resources and power in both law and employment

POLICY INTERVENTIONS

1. Recognise that gender equality is essential for economic prosperity and social cohesion
2. Massively scale up investment to meet 2030 education targets and guarantee the right to education for women and girls
3. Ensure gender equality in leadership positions in public and private bodies
4. Guarantee universal social protection and adequate universal pension systems

SDGs ADDRESSED

Average wellbeing index

School life expectancy (years)

Female pre-tax labour income share

Worker disposable income

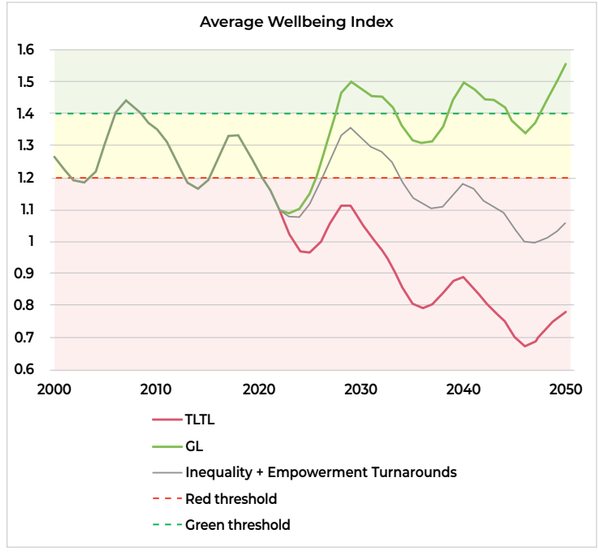
Ratio of owner incomes to worker incomes

Public services per person total

Social tension

2.1. Earth4All modelling results for the Inequality and empowerment turnarounds

Earth4All indicator for Good Health and Wellbeing (SDG 3)



Scenario outcomes for Average Wellbeing Index

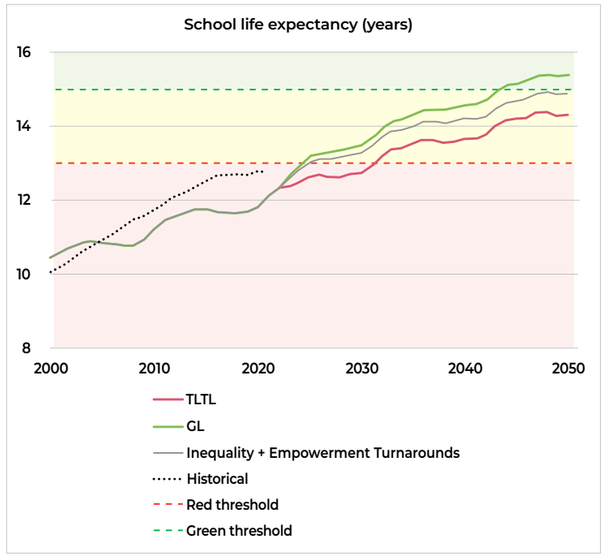
Wellbeing is measured on the basis of the Earth4All Average Wellbeing Index. The Index has five components: dignity, natural health, strength of institutions, fairness and equality, and citizen participation.

Too Little Too Late
Wellbeing drops significantly from the 2020 level of 1.1 to 0.7 in 2040 (albeit with an increase up to 0.8 in 2050). This decrease represents a very serious downturn of wellbeing to unprecedented low levels. The poor result under the Too Little Too Late scenario is due to the combined consequences of inequality and climate change, which are never resolved.

Giant Leap
Wellbeing dramatically increases from the 2020 level of 1.1 to 1.5 by 2030. Despite a few subsequent fluctuations, it rises exponentially again to exceed 1.5 by 2050. This is because of the combined effects of elimination of poverty, lowered warming and reduced inequality.

Key insights
The graph shows that the combined inequality and empowerment turnarounds fail to reach the red threshold of the Wellbeing Index after dropping below it around the mid-2030s. However, there is still a massive difference between the trajectory of these combined inequality and empowerment turnarounds and the Too Little Too Late scenario, where wellbeing plummets to the lowest levels seen in the past 20 years.

Earth4All indicator for Quality Education (SDG 4)



Scenario outcomes for school life expectancy

Too Little Too Late

School life expectancy increases from the 2021 average of approximately 12.8 years of schooling to 14 years of schooling by 2050.

Giant Leap

School life expectancy increases to 15.5 years of schooling by 2050. This additional 1.5 years of schooling compared with Too Little Too Late translates into higher life expectancy, improved employment prospects and increased incomes, improved economic prospects and improved health.

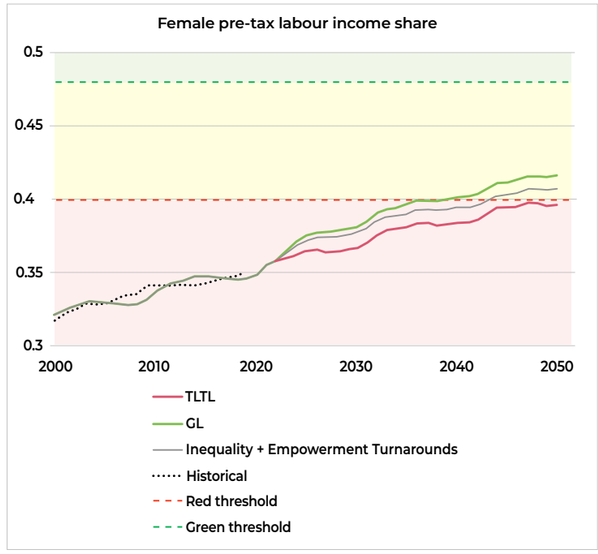
Key insights

School life expectancy in the Giant Leap scenario performs significantly better than Too Little Too Late by surpassing the higher end of the indicator before 2050, notably high school completion as measured by 15 years of school life expectancy (including preschool).

Neither the Too Little Too Late scenario nor the combined inequality and empowerment turnarounds ever reach the higher end of the goal. Nevertheless, the Inequality and empowerment turnarounds are important contributors to increased school life expectancy, especially the policy levers that involve increased funding to education to ensure free access, and new legislation to ensure gender parity in schools.

Once again, the difference between the Too Little Too Late scenario and the combined inequality and empowerment turnarounds can be explained by the synergistic effects of the policy levers that are contained in the Inequality and empowerment turnarounds as well as the poverty turnaround (i.e. greater public spending on education and higher incomes lead to greater access and affordability for education, thereby translating into longer school life expectancy).

Earth4All indicator for Gender Equality (SDG 5)



Scenario outcomes for female pre-tax labour income share

Too Little Too Late

The share of female pre-tax labour income increases steadily from the 2019 level of 35%, but only reaches 40% by 2050 and then levels off, meaning no further improvements are happening.

Giant Leap

The share of female pre-tax labour income increases to 42% by 2050 with a continuous and upward trend into the future to 46% by 2100. This is a steady improvement that can be accelerated as more women move into policymaking and leadership positions.

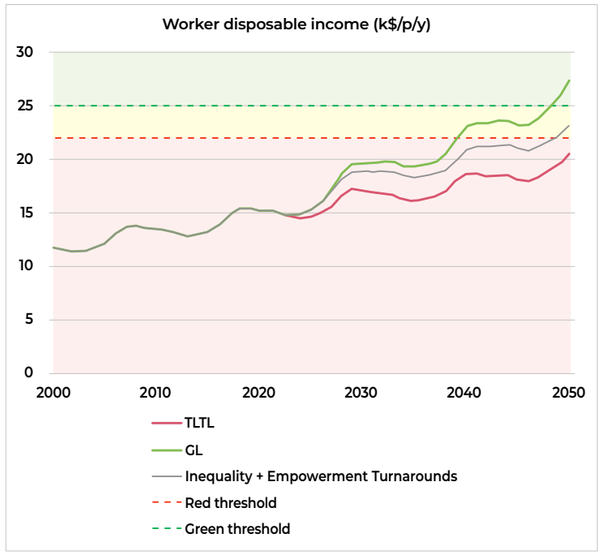
Key insights

Despite the improvement in reducing the overall gender gap across politics, education, health and work, the reality is that the gender pay gap has actually widened significantly in recent years. The UN estimates that at the current rate of progress, it will take 257 years to close the global gender pay gap.[32]

The Too Little Too Late scenario almost reaches the red threshold; the inequality and empowerment turnarounds reach it but only barely. The challenge of changing societal norms, policies and regulations around gender equality is an extremely slow process and requires a high level of ambition on all fronts simultaneously.

[32] https://news.un.org/en/story/2022/09/1126901

Earth4All indicator for Decent Work and Economic Growth (SDG 8)



Scenario outcomes for worker disposable income

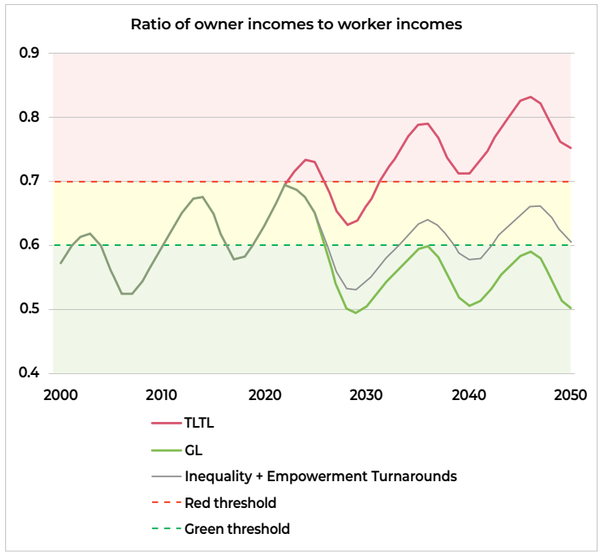
Too Little Too Late
Annual worker disposable income fails to reach adequate levels by 2050, with workers attaining an average of $20,500 in annual disposable income. The graph shows that the Too Little Too Late scenario does not even get us to the red threshold for this indicator ($22,000 per year).

Giant Leap
Annual worker disposable income reaches $27,400 by 2050. This translates to an additional $6,900 per person annually, which will mean an enormous difference for most poor households around the world, especially those living in the grips of energy and food poverty.

Key insights
Only the Giant Leap exceeds the green threshold ($25,000 per year) by 2040. This is largely because of the broader array of important policy interventions, including tax reform to ensure greater progressivity in the system and more resulting revenue for basic human needs, as well as safety nets and innovation policies such as the universal basic dividend.

While the combined inequality and empowerment turnarounds reach the red threshold by 2050, they do not reach the green threshold. Once again, this highlights that it is the combined synergies of the policy levers in the Giant Leap scenario – containing all of the five turnarounds simultaneously – that are critical to get us to that threshold.

Earth4All indicator for Reduced Inequalities (SDG 10)



Scenario outcomes for ratio of owner incomes to worker incomes

We acknowledge that many other dimensions of inequality are not encapsulated by this metric; however, income inequality is a very important reflection of overall equality within societies. This indicator is particularly relevant in light of the revelations in recent studies that CEO salaries have "skyrocketed 1,460% since 1978" and that, in 2021, CEOs were paid "399 times as much as a typical worker".[33]

Too Little Too Late
Income inequality worsens as the gap between owner incomes and worker incomes widens. By 2050, owners account for 75% of incomes while workers account for only 25%.

Giant Leap
Income equality improves significantly. Owners and workers each account for 50% of incomes by 2050.

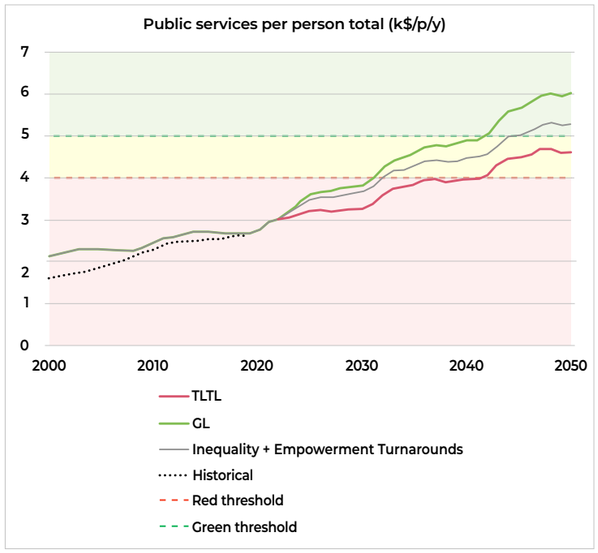
Key insights
As the Too Little Too Late trajectory shows, the rich keep getting richer, while the poor keep getting poorer. Exorbitant CEO pay directly contributes to rising inequality, especially in high-income countries, but can be restrained without damaging the wider economy. Studies show that the economy would suffer absolutely no harm if CEOs were paid less or taxed more.

The graph shows that the combined inequality and empowerment turnarounds perform noticeably better than the Too Little Too Late scenario, with the improvements widening over time given the inherent lag in policymaking processes related to the policy levers in these turnarounds.

Only the Giant Leap reaches the green threshold for this indicator – it continues to trend towards reduced income inequality once policy interventions are operationalised, especially increases in progressive taxation, universal social protection and protection of workers' rights, among others.

[33] https://www.epi.org/publication/ceo-pay-in-2021/

Earth4All indicator for Peace, Justice and Strong Institutions (SDG 16)



Scenario outcomes for public services per person

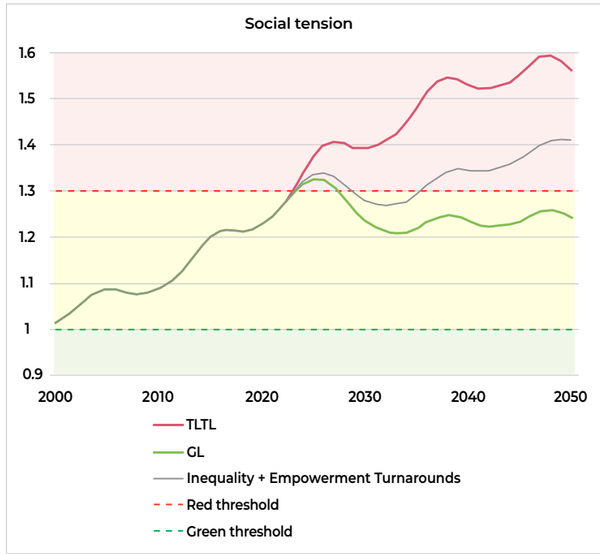
We use the volume of public services per capita (k$/p/y) as the main indicator for peace, justice and strong institutions (SDG 16). Once again, there are many metrics that help with understanding the inherent complexities of SDG 16. However, this indicator measures government investment in social wellbeing through public infrastructure funding, including health, education, electricity, etc. All of these are essential to the overarching aim of SDG 16 – promoting peaceful, fair and inclusive societies through strengthened institutions that are fair, accountable and participatory.

Too Little Too Late
Public service spending per person per year only increases to $4,800 by 2050, compared with 2019 levels of $2,700 per person.

Giant Leap
Public service spending trends significantly upwards and $6,000 is spent per person per year by 2050. This represents an additional $8.8 trillion spent on public services worldwide annually compared with Too Little Too Late. This is equivalent to twice the GDP of Germany.

Key insights
Under all three scenarios for this indicator, we see a general upward trend between now and 2050. However, only the Giant Leap comfortably exceeds the green threshold of $5,000/per person/per year, with average spending of just over $6,000/per person/per year by 2050. The combined inequality and empowerment turnarounds achieve a little over the green threshold by 2050, while Too Little Too Late hovers around $4,800 by 2050.

Earth4All indicator for Partnership for the Goals (SDG 17)



Scenario outcomes for social tension

Unlike most of the other indicators that are reflected in percentages of the population having access to a certain resource (e.g. water, food, energy), the social tension indicator is calculated completely endogenously based on observed rates of progress. We chose this metric because rising social tension, especially the rise of nationalism in many parts of the world, is making it increasingly difficult to achieve the international cooperation and partnerships envisaged by SDG 17.[34]

Too Little Too Late
Social tension trends steeply upwards, reaching an alarming level of 1.56 in 2050 that far exceeds modelled current levels of 1.3.

Giant Leap
The upward trend historically seen in social tension levels halts in 2025, and plateaus around current levels, dipping slightly to 1.24 by 2050.

Key insights
As the graph illustrates, social tension will drastically accelerate as we approach 2050 under the Too Little Too Late scenario, far exceeding threshold levels, as our modelling suggests. High levels of mistrust between institutions thwart the creation of effective partnerships for reaching the goals.

Under the Giant Leap scenario, social tension is mitigated and maintained at levels comparable to today. In the Giant Leap we manage to decrease social tension to a level that positively influences sustainable social and environmental developments. This trend continues in the future.

Key mitigation actions include improving overall health and wellbeing, increasing public spending on basic human needs, reducing income inequality, and implementing universal social protection. However, even under the Giant Leap scenario, we need more transformative policy measures to reduce social tension to well below the green threshold level as reflected in the graph. These measures include greater efforts to head off runaway inflation, rising interest rates and looming debt burdens.

[34] https://sdgs.un.org/goals/goal17

2.2. The policy interventions needed for the inequality turnaround

In this section, we highlight the specific policy interventions that are necessary to achieve the inequality turnaround. The policy interventions for the empowerment turnaround are presented in Section 2.3.

The Earth 4All inequality turnaround recognises that countries where citizens are economically more equal function better. They have greater social cohesion and perform better in all areas of human wellbeing and achievement than countries with divisive levels of income inequality. More equal countries (especially the Nordic countries) tend to have better outcomes when it comes to trust, education, social mobility, longevity, health, obesity, child mortality and mental health, among others.

The most urgent interventions for turning around inequality are:

- Governments must tax the rich – more progressive taxation on both income and wealth of individuals and corporations.
- Governments must urgently reverse the steady erosion of workers' rights, through the strengthening of labour rights and trade unions' negotiating power.
- Governments must implement new safety nets and innovative approaches for sharing prosperity, such as the universal basic dividend (UBD).

Governments must tax the rich

Earth4All asserts that taxing the super-rich is not just essential for reducing inequality, ensuring democracy and guaranteeing political and economic stability, it plays a vital role in the climate crisis (see the energy turnaround). Climate change and its effects are disproportionately driven by the investments and emissions of the wealthiest people. The richest 1% – over 80 million people – are the fastest-growing source of emissions by far: on average their investments result in a million times more emissions than one average person. Despite the continued resistance by the international community to wealth taxation, we believe that its potential for redressing wealth inequality is greater than ever. In addition to the growing evidence about the increase and impact of wealth inequality, there is a growing awareness and diminished tolerance on the part of the general public for tax avoidance and evasion by wealthy individuals and multinational companies when the cost of living has increased for so many due to the polycrisis of interrelated challenges that the world faces today. With 2024 as a critical election year in many countries, including the US and within the EU, we believe that the increase in perceived inequality will translate into stronger demands for redistributive tax policies. There is a risk that a lack of effort by governments to redistribute wealth and ensure a just transition will create greater instability and exacerbate the slide back against democracy.

Governments must urgently reverse the steady erosion of workers' rights

The importance of rigorous laws to strengthen workers' rights and trade unionisation are critical because in a time of deep transformation, workers need economic protection and new skills development opportunities. This is essential to renewing equality within societies, especially between workers and employers because of rising CEO pay as a major contributor to rising inequality. This widening pay gap is fuelling the growth of the top 1% and top 0.1% incomes, "leaving fewer gains of economic growth for ordinary workers and widening the gap between very high earners and the bottom 90%".[35] Reversing the erosion of workers' rights will require efforts by governments to strengthen labour rights and the negotiating power of workers in order to increase the worker share of national income. Governments must also renew collective bargaining rights after decades of erosion of union and worker power. Finally, governments must empower more workers with co-ownership and seats in the boardroom to influence decisions and to give them a stake in company futures.

Governments must implement a Universal Basic Dividend (UBD)

The UBD is an underexplored policy lever that can help to fundamentally redress inequality within societies. It entails investing a portion of the profits made by large corporations through publicly subsidised innovations into a public fund disseminated using a basic dividend, similar to what stock traders might receive.[36] The UBD is premised on the assertion that resources in the global commons cannot be legitimately owned by private individuals or enterprises. This means that any financial benefit derived from the exploitation of these resources must be shared with the general public.[37] The UBD is also grounded in the belief that, in most cases, wealth is produced collectively and privatised by those with the power to do it, notably the corporate elite. This underpins the general public's right to a share of the capital stock, and associated dividends, reflecting society's investment in corporations' capital.[38]

The UBD proposal is based on proven effective ways to transfer a portion of the wealth extracted from common resources such as fossil fuels, land, real estate or social data. In addition to redistributing wealth more fairly, this will provide essential individual economic security during the transformation of societies, and it is likely to spur creativity, innovation and entrepreneurship.

2.3. The policy interventions needed for the empowerment turnaround

In this section, we highlight the specific policy interventions that are necessary to achieve the empowerment of women and other disadvantaged groups. This turnaround is about enabling the access of women, girls and other disadvantaged groups to:

- Education, health services and lifelong learning.
- Financial independence and leadership positions.
- Economic security through universal social protection.

Empirical data shows that economies that support greater equality score highest in global rankings of wellbeing and human development.[39] Gender equality is about removing discrimination in order to achieve greater inclusiveness and equity in society. These are fundamentally the conditions that build social cohesion, and which embed fairness and justice more deeply in society. In turn, societies become more resilient to shocks such as financial crises, pandemics and food price volatility.

Shockingly, gender equality (SDG 5) – which we explore through the indicator of income disparity (percentage of pre-tax labour income held by women) – will not be achieved in the next two centuries. Indeed, the UN estimates that, at the current rate of "progress", it will take:

- 286 years to close gaps in legal protection and remove discriminatory laws;
- 140 years for women to be represented equally in positions of power and leadership in the workplace; and
- 40 years to achieve equal representation in national parliaments.

Against this backdrop, the most urgent policy interventions for the empowerment turnaround are:

- Governments must reverse the lack of progress on gender equality.
- Donor governments must massively scale up investment to meet 2030 education targets.
- Governments must guarantee the right to education for women and girls.

[35] https://www.epi.org/publication/ceo-pay-in-2021/

[36] https://medium.com/dataseries/universal-basic-dividend-vs-income-19f04f7136ac

[37] https://medium.com/iipp-blog/universal-basic-dividend-as-a-form-of-welfare-e11ed4349b07

[38] https://medium.com/iipp-blog/universal-basic-dividend-as-a-form-of-welfare-e11ed4349b07

[39] *Earth for All: A Survival Guide for Humanity*, Empowerment chapter, p.106.

Governments must reverse the lack of progress on gender equality

The world is at a tipping point for women's rights and gender equality. Governments must massively scale up investment in women and girls to reverse the regressions in their lives in terms of income, safety, education and health, all of which have been exacerbated by cascading global crises. Gender equality is at the heart of all SDGs, and governments must now rally to significantly increase investment and rigorously implement legal systems that: ban violence against women; protect women's rights in marriage and families; guarantee equal pay and benefits at work; and guarantee their equal rights to own and control land. The reality is that the longer that governments take to put these urgent actions in place, the more it will cost and the more difficult it will be to change course in order to achieve full gender equality and a more thriving economic system that delivers prosperity for all before the next millennium.

Donor governments must massively scale up investment to meet 2030 education targets

Even before the COVID-19 pandemic, the world was already way off track to achieve its education targets under SDG 4. Currently, only one in six countries will meet SDG 4 and achieve universal access to quality education by 2030.[40] A total of 57 million primary-aged children remain out of school, with "more than half of them in sub-Saharan Africa".[41]

We know that scaling up investment will be critical for getting SDG 4 back on track by 2030. Earth4All supports the UN in its call for an infusion of $148 billion in annual financing to bridge the financing gap if low- and lower-middle-income countries are to meet SDG 4 by 2030. As UNESCO asserts: "Additional costs due to COVID-19 related school closures risk increasing this current financing gap by up to one-third". Investment now could reduce this additional cost by up to 75%.[42]

In addition to the much-needed immediate mobilisation of resources, we must also address the reality that education is a systemic economic challenge. The early years of austerity-imposed lending by the IMF and World Bank meant that many low- and middle-income countries were required to introduce user fees, with many poor populations having to spend over 10% of their yearly income just to send two children to school. This reality underscores the importance of Earth4All's call for debt relief under the poverty turnaround, to free up fiscal space for low-income countries to fund the necessary social and educational programmes for the next generation of children to thrive, not just survive.

Governments must guarantee the right to education for women and girls

Although we analyse SDG 4 in terms of the indicator of school life expectancy, we must highlight the importance of gender parity in primary, secondary and tertiary education. Gender parity in education is an important policy lever in the empowerment turnaround. However, the reality is that despite the fact that all Member States have made commitments to realise the right to education for all, "fewer than half of the world" countries have achieved gender parity in primary education.

Moreover, as recently as January 2023, the United Nations confirmed that 130 million girls around the world continue to be denied the human right to education. This is unconscionable and must be rectified by government action to operationalise the right to education for women and girls by: repealing laws that block girls from accessing quality education; regularly reviewing and evaluating constitutional guarantees and legislative and policy frameworks to counter discrimination; ensuring gender-sensitive budgeting for girls' education; and importantly, ensuring that the right to education is justiciable, and that girls are aware of their rights and have access to sensitive and safe judicial and non-judicial remedies.

[40] https://sdgs.un.org/goals/goal4
[41] https://www.undp.org/sustainable-development-goals/quality-education
[42] https://unesdoc.unesco.org/ark:/48223/pf0000374163
[43] Earth for All: A Survival Guide for Humanity, p.102.
[44] https://www.ohchr.org/en/press-releases/2023/01/world-failing-130-million-girls-denied-education-un-experts
[45] https://www.ohchr.org/en/press-releases/2023/01/world-failing-130-million-girls-denied-education-un-experts
[46] https://www.ohchr.org/sites/default/files/Documents/Issues/Women/WRGS/ReportGirlsEqualRightEducation.pdf

3. FOOD TURNAROUND

We illustrate the systemic nature of the food turnaround by providing insights from the modelling of a representative sample of indicators, including fertiliser use (SDG 12), pH for ocean surfaces (SDG 14) and expansion of cropland (SDG 15).

The Earth4All food turnaround is predicated on achieving "A regenerative, sustainable food system that works for all within planetary boundaries". The call to action in Earth for All: A Survival Guide for Humanity is to "transform the food system towards regenerative and sustainable agriculture and provide healthy diets for people without destroying the planet – halting biodiversity loss and protecting the global commons to ensure food for all without destroying nature and health". Achieving a global food system that is optimised to feed more people on a healthy planet is a prerequisite for fighting inequality and poverty in the 21st century.

Goal: A regenerative, sustainable food system that works for all within planetary boundaries.

POLICY INTERVENTIONS

1. Remove perverse agriculture subsidies
2. Food production must shift from industrial to sustainable and regenerative agriculture practices
3. Localised consumption, food sovereignty, and farmworker rights must be prioritised and protected
4. Improve access to knowledge, technology and leapfrogging

SDGs ADDRESSED

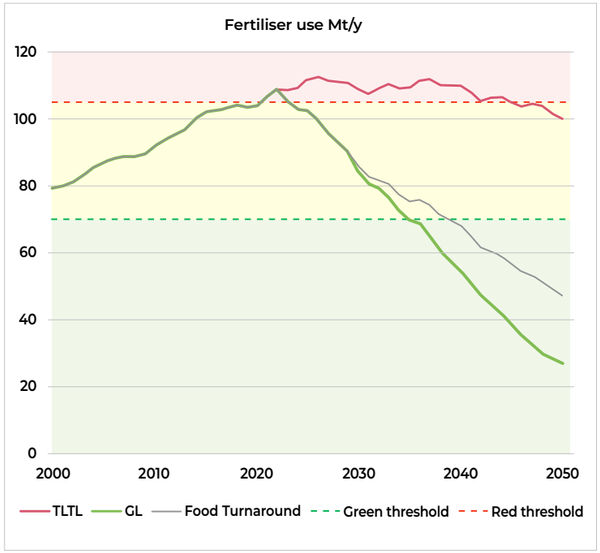
Fertilizer use

pH in ocean surface

Expansion of cropland

3.1. Earth4All modelling results for the food turnaround

Earth4All indicator for Sustainable Production and Consumption (SDG 12)



Scenario outcomes for fertiliser use

We have chosen fertiliser use (the sum of synthetic inputs of nitrogen, potassium and phosphorus) as our indicator for SDG 12, specifically as applied to agriculture and food production. Further indicators will be elaborated in future working papers. A decline in fertiliser use is an important reflection of the transition to more sustainable and responsible food production systems. The green and red thresholds for this indicator are set at 70 and 105 million tonnes per year, respectively.

Too Little Too Late
Fertiliser use continues to rise and remains above the red threshold for 30 years (i.e. above 105 million tonnes per year). It only starts to taper off in 2048 and declines to 100 million tonnes per year by 2050.

Giant Leap
The decline in fertiliser use starts in 2020 and continues its exponential downward trend towards 2050. It far exceeds the green threshold and lands at 25 million tonnes per year, representing one quarter of the volume of fertiliser use in the Too Little Too Late scenario.

Key insights
The global production and use of nitrogen fertiliser for food production accounts for approximately 5% of greenhouse gas emissions. This is why the dramatic decline in fertiliser use in the Giant Leap is so important for the climate change battle. Fertiliser production and use is also a serious concern for the planetary boundaries on nitrogen and phosphorus, and a significant reduction of global fertiliser use is required to move away from the high-risk zone of this boundary.[48]

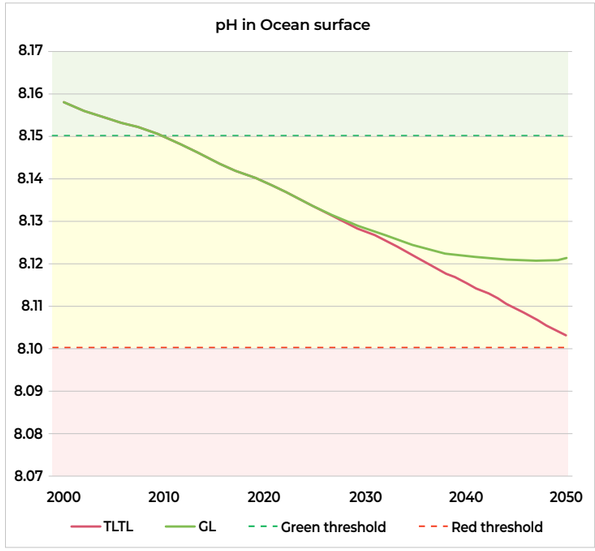
Although the historical upward trend for fertiliser use is reversed in all three scenarios, there is a dramatic difference between the Too Little Too Late scenario, the food turnaround and the Giant Leap scenarios. The food turnaround and the Giant Leap both enable the world to drop far below even the green threshold for fertiliser use.

[48] https://www.stockholmresilience.org/research/planetary-boundaries/the-nine-planetary-boundaries.html

However, the Giant Leap reaches the green threshold well before the food turnaround scenario. This is made possible by the synergistic policy interventions that include increasing renewable-powered electricity for fertiliser production, reducing overall demand for fertilisers and improving their overall efficiency, especially because in many cases the amount of nitrogen used on crops is much greater than the actual nitrogen requirements of crops. Additionally, the synergistic effects of the socio-economically focused turnarounds lead to faster policy implementation.

When producing food using sustainable practices such as regenerative agriculture, including regenerative grazing practices, similar crop output quantities are possible while reducing the amounts of environmentally damaging chemical fertilisers. However, we do acknowledge that while a reduction in fertiliser use is much needed in high- and middle-income countries, the opposite is very often true in low-income countries where soils can be poor and require nutrient boosts for certain short-term periods.

Earth4All indicator for Life Below Water (SDG 14)



Scenario outcomes for pH of the ocean surface

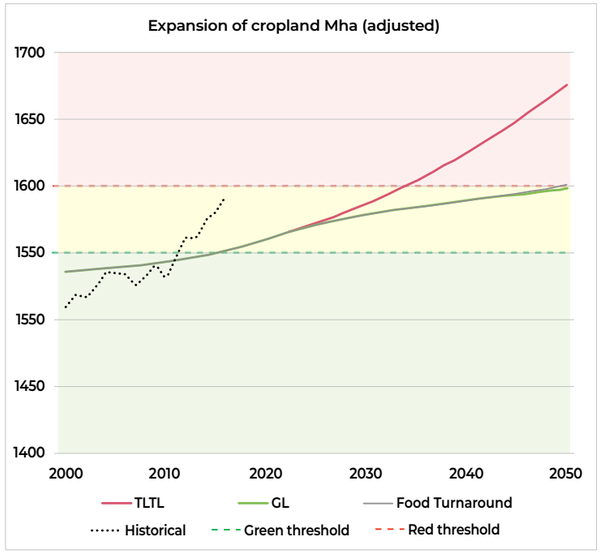
We model pH in ocean surface to understand progress with SDG 14. Today, average ocean pH is about 8.1 and it should not drop any lower if oceans are to continue absorbing CO2. Ocean acidity is especially critical in regard to food systems because of its severe impacts on marine organisms, which alter marine food chains and food supply to humans.

Too Little Too Late
The ocean continues to acidify with pH levels decreasing significantly between now and 2050. Too Little Too Late brings the world towards dangerously acidic water by the mid-century.

Giant Leap
Ocean pH plateaus around 2040, and begins to improve by around 2048, moving towards safer levels of ocean acidity.

Key insights
Only the Giant Leap scenario manages to shift away from the downward trend in pH value as we approach 2050. The continuous downward trend in the Too Little Too Late scenario is harming marine food chains and human food supply. In the Giant Leap, on the other hand, corals and other forms of marine biodiversity benefit from lower acidity due to more carbonate ions being available for calcification processes.

Earth4All indicator for Life On Land (SDG 15)



Scenario outcomes for industrial farmed cropland

Securing life on land (SDG 15) is about leaving the carbon economy behind while ensuring sustainable and regenerative land and soil development for carbon capture, enhancing both rural and urban areas and protecting old-growth forest areas and other important terrestrial ecosystems. Since we have chosen to explore SDG 15 in relation to the food turnaround, we have selected the expansion of industrial farmed cropland as the main indicator in this report.

Too Little Too Late
Industrial farmed cropland continues to expand exponentially, reaching approximately 1,675 million hectares by 2050, compared with 1,593 million hectares in 2016.

Giant Leap
Industrial farmed cropland expansion is significantly mitigated, levelling out at 2016 levels of approximately 1,598 million hectares by 2050.

Key insights
Under both the Giant Leap and the Too Little Too Late scenarios, industrial farmed cropland is seen to continue to expand. However, it is important to note that the level of expansion remains below the red threshold under the Giant Leap scenario, with less destruction to the ecosystem, whereas it is far higher under Too Little Too Late, as seen in the graph.

The absolute difference between the two scenarios is a 77-million-hectare reduction in the Giant Leap as compared with Too Little Too Late. This roughly equates to a difference in farmed cropland totalling the size of Turkey.

3.2. The policy interventions needed for the food turnaround

In this section, we highlight the specific policy interventions that are necessary to achieve the food turnaround. These are:

- Governments must repurpose perverse agriculture subsidies.
- Food production must shift from industrial to sustainable and regenerative agricultural practices.
- Localised consumption, food sovereignty and farmworker rights must be prioritised and protected.
- Efficiency must be improved across the supply chain, including waste reduction.

As with all the turnarounds, these interventions have been adapted to the results of our indicator modelling.

Governments must repurpose perverse agriculture subsidies

Direct agriculture subsidies are estimated at over $635 billion a year and are driving the excessive use of environmentally harmful subsidies. Over 90% of these subsidies damage human health, fuel the climate crisis, destroy nature and drive inequality by excluding smallholder farmers, many of whom are women.[49] Without reform, agricultural subsidies could rise to over $1 trillion per year by 2030.[50]

A recent World Bank report estimates that subsidies for soya beans, palm oil and beef are responsible for 14% of forest loss every year.[51,52] Beef and milk receive the biggest subsidies, which is not surprising because their production represents the biggest sources of greenhouse gas emissions in the agriculture sector.

There is ample best practice for subsidy reform and repurposing perverse subsidies, not just in agriculture but in energy and other extractive sectors. Regarding agricultural subsidies, we emphasise that these should be repurposed towards low-carbon and regenerative agricultural techniques and empowering smallholder farmers to ensure rural prosperity within planetary boundaries.[53] At the same time, the shift away from chemical agriculture must be carried out in a carefully planned transition, especially for smaller farmers, by providing them with special subsidies for agro-ecological practices.[54]

Circling back to our modelling of fertiliser use, we highlight that profits by chemical fertiliser companies grew exponentially from $14 billion before the COVID-19 pandemic to $28 billion in 2021, and further increased to $49 billion in 2022.[55] These unconscionable levels of profit underpin the strong case for a windfall profit tax as called for in the inequality turnaround section, which should be sufficiently high as to discourage further attempts by multinational companies to yet again raise prices.[56]

Food production must shift from industrial to sustainable and regenerative agricultural practices

As we highlight above, governments must repurpose perverse subsidies that promote chemical input dependence. But we need a massive transformative change of the global food system, which currently is largely dominated by multinational corporations and trade versus guaranteed access to food as a universal human right. The whole system is predicated on high-carbon, unsustainable and unhealthy production and

[49] https://www.theguardian.com/environment/2021/sep/14/global-farm-subsidies-damage-people-planet-un-climate-crisis-nature-inequality
[50] https://www.theguardian.com/environment/2021/sep/14/global-farm-subsidies-damage-people-planet-un-climate-crisis-nature-inequality
[51] https://www.worldbank.org/en/news/press-release/2023/06/15/trillions-wasted-on-subsidies-could-help-address-climate-change
[52] https://www.worldbank.org/en/topic/climatechange/publication/detox-development
[53] https://www.wri.org/research/farm-restoration-subsidies
[54] https://www.ineteconomics.org/perspectives/blog/subsidizing-chemical-fertilizers-is-counterproductive
[55] https://www.ineteconomics.org/perspectives/blog/subsidizing-chemical-fertilizers-is-counterproductive
[56] https://www.ineteconomics.org/perspectives/blog/subsidizing-chemical-fertilizers-is-counterproductive

consumption patterns, with enormous waste across all stages of production and distribution.

As Earth4All TEC member Jayati Ghosh asserts: "The global food system also produces massive greenhouse gas emissions, thereby inflicting substantial ecological damage, and deprives small-scale farmers in many countries of secure and viable livelihoods. Perhaps worst of all, food access remains profoundly unequal, causing extreme hunger to increase rather than decline."[57]

The transition to sustainable and regenerative agricultural practices will take time, and it will, in some cases, be more expensive, which is why perverse subsidies must be redirected to free up investment in healthier, sustainable and – most importantly – regenerative practices. The production of food using cleaner and more sustainable technologies and practices will also drastically reduce the need for chemical fertilisers,[58] which are the main concern for the planetary boundary transgressions in relation to the nitrogen and phosphorus cycles.[59]

Localised consumption, food sovereignty and farmworker rights must be prioritised and protected

Localised food production is not only supportive of planetary health, but also encourages greater community cohesion, resilience and connection. This is directly related to the call for food sovereignty as "the right of each nation to maintain and develop its own capacity to produce its basic foods respecting cultural and productive diversity".[60]

Additionally, the Food and Agriculture Organization (FAO) emphasises that fair and equitable working conditions for those who grow, sell and process food is essential to achieving true food security: "Challenges are particularly aggravated for migrant, undocumented and seasonal workers, who may lack access to legal protection and face further discrimination due to language and cultural differences or their inability to seek justice."[61]

Gender considerations are hugely important as well; while women make up 43% of agricultural workers, they represent only 15% of landowners, despite an estimate that giving women equal access to food-related support and resources could provide sufficient nourishment to 100–150 million people.[62,63] Justice and human rights considerations must therefore be central to policy decisions around food system reform.

As a bare minimum, governments have a responsibility to regulate companies and ensure the implementation of workers' rights across the supply chain,[64] and mechanisms of accountability and improvement must be conceived and implemented in collaboration with the voices and wellbeing of workers at the core. The Coalition of Immokalee Workers has created the Fair Food Program,[65] a partnership between farmworkers, growers and buyers that the UN stated "must be considered as an international benchmark"[66] against agricultural exploitation to ensure worker dignity and create an ethical supply chain.[67] The encouragement and protection of such partnerships are essential to the realisation of food sovereignty and sustainability supportive of health and dignity for all.

Efficiency must be improved across the supply chain, including waste reduction

Approximately one third of crops produced globally is wasted. This means close to 2 billion tonnes of food never makes it to consumers. In 2017, food waste emissions measured at 9.2 billion tonnes of CO2-equivalent, approximately as much as the total emissions of the US and UK that year combined,[68] and many fisheries throw away more fish than they keep.[69]

Interventions to reduce and prevent food waste are thus crucial to reducing waste and emissions, and increasing the food available for a growing world population. Improving storage and cooling facilities among small-scale farmers and reducing intermediaries in the supply chain, particularly in low- and middle-income countries, will decrease one of the root causes of food waste[70] as well as provide more income to farmers directly, thus strengthening rural livelihoods and small-scale farming operations. Behavioural interventions for consumers may be considered to address household-level food waste, particularly when targeting attitudes and social norms.[71] A study by the European Commission found that up to 10% of annual food waste (8.8 million tonnes) was related to food "use by" dates,[72] supporting the idea of policy interventions that revise or clarify this label on packaging.[73]

[57] https://www.ineteconomics.org/perspectives/blog/subsidizing-chemical-fertilizers-is-counterproductive

[58] This is shown by the decrease in the indicator used for the modelling of SDG 12 – Chemical Fertiliser Use – under the Giant Leap scenario.

[59] https://www.stockholmresilience.org/research/planetary-boundaries/the-nine-planetary-boundaries.html

[60] https://viacampesina.org/en/the-1996-rome-food-sovereignty-declaration-in-postcards/#:~:text=Food%20is%20a%20basic%20human,respecting%20cultural%20and%20productive%20diversity

[61] https://www.fao.org/3/cc1867en/cc1867en.pdf

[62] https://www.ifad.org/en/web/latest/-/these-numbers-prove-that-rural-women-are-crucial-for-a-better-future

[63] This is also related to SDG 5 (empowerment).

[64] As noted in the *Earth for All* chapter on the food turnaround, "Regulations should at least require implementation of the OECD/ILO Human Rights Due Diligence (HRDD) process."

[65] https://fairfoodprogram.org/

[66] https://ciw-online.org/blog/2017/01/un-expert-ffp/

[67] This is also related to SDG 8 (decent work and economic growth).

[68] https://www.carbonbrief.org/food-waste-makes-up-half-of-global-food-system-emissions/

[69] https://www.worldwildlife.org/industries/sustainable-seafood

[70] https://www.sciencedirect.com/science/article/abs/pii/S0921344916301902

[71] https://pubmed.ncbi.nlm.nih.gov/26299713/

[72] https://op.europa.eu/en/publication-detail/-/publication/e7be006f-0d55-11e8-966a-01aa75ed71a1/language-en

[73] https://link.springer.com/article/10.1007/s10668-023-03132-0

4. ENERGY TURNAROUND

The Earth 4All energy turnaround goal is net-zero emissions by 2050. This means transforming our inefficient fossil energy system to a clean and optimised energy system and ensuring both a reduction in consumption in high-income countries and greater efficiencies across our global energy system, so as to reach "a 50% cut in GHG emissions by 2030 and net-zero carbon and biodiversity loss by 2050, thereby ensuring sustainable energy for all".[74]

We illustrate the systemic nature of the energy turnaround by providing insights from the modelling of a representative sample of indicators, including electricity access (SDG 7), CO2 intensity (SDG 9), observed warming (SDG 13) and emissions per person (SDG 11).

Goal: Improved energy access for lower income country citizens. Zero emissions by 2040 through low carbon energy sources and efficiencies

POLICY INTERVENTIONS

1. Investment in renewables and efficiency must be tripled
2. Ensure that climate financing is provided as concessional grants and not as loans
3. Make renewable energy affordable by redirecting fossil fuel subsidies
4. Support global price on carbon and guarantee access to clean, safe, and affordable energy for all

SDGs ADDRESSED

Electricity access

CO2 intensity

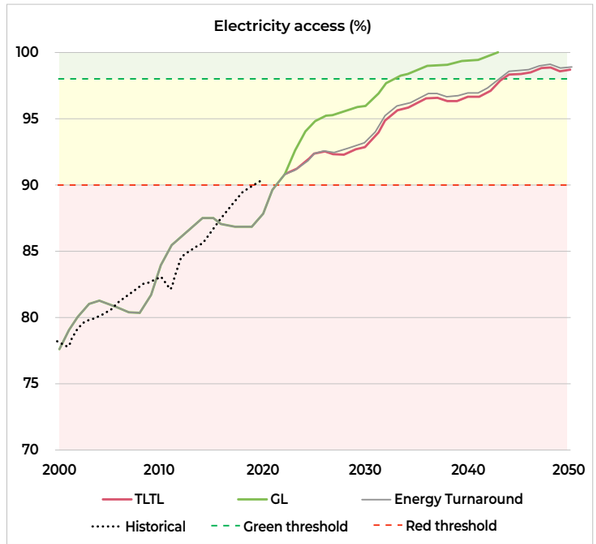
Emissions per person

Observed warming

[74] https://earth4all.life/wp-content/uploads/2023/03/Earth4All_Exec_Summary_EN.pdf

4.1. Earth4All modelling results for the energy turnaround

Earth4All indicator for Energy (SDG 7)



Scenario outcomes for access to electricity

Too Little Too Late
Electricity access continues to improve. By 2050, 98.7% of the population has access to electricity, as compared with 90.4% in 2020.

Giant Leap
Electricity is universally accessible. By 2050, 100% of the population has access to electricity that is produced sustainably. In the Giant Leap the green threshold is met soon after 2030.

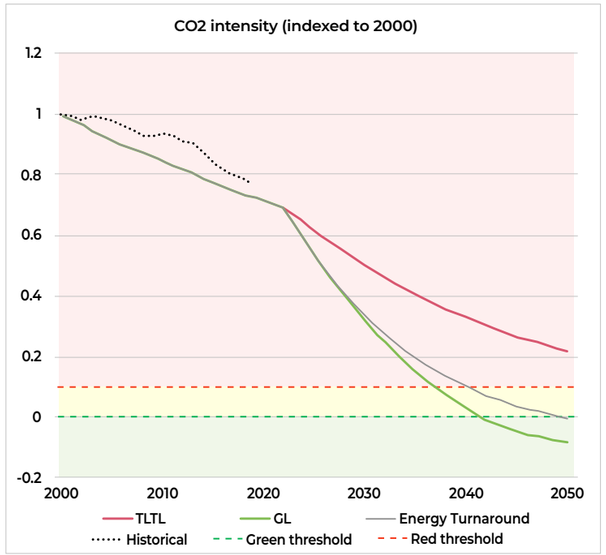
Key insights
The world is rapidly improving the electricity grid, which means that the Giant Leap and the Too Little Too Late scenarios surpass the green threshold (namely 98% of the population having access to electricity) by 2050.

The big difference is that the Giant Leap reaches this threshold 10 years earlier (early 2030s) than the Too Little Too Late scenario (early 2040s). The electricity production in Giant Leap is also fully decarbonised by 2050, which does not happen in the Too Little Too Late scenario.

It is only with the synergistic implementation of all five turnarounds under the Giant Leap scenario that the aim of expanding access to electricity is achieved sustainably, notably with the phase-out of coal, oil and gas. Additionally, since electricity access can have positive spillovers on, for example, education and income developments, the sooner electricity access is realised, the higher its positive impact on other socio-economic developments that are subject to delays. Therefore, their attainment is positively affected by early high electricity access rates.

Although our modelling does not disaggregate on the basis of socio-economic status, we acknowledge that there are serious distinctions in terms of the unequal access to energy in low-income countries as compared with middle- and high-income countries (and increasingly within higher-income countries). Access challenges are just as relevant for the poverty and inequality turnarounds as for the energy turnaround.

Earth4All indicator for Industry, Innovation and Infrastructure (SDG 9)



Scenario outcomes for CO2 intensity

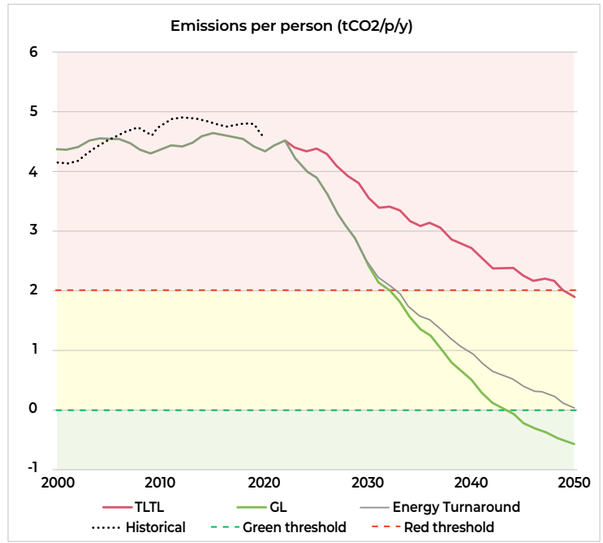
We chose CO2 intensity as our indicator to understand progress with SDG 9 on infrastructure, industrialisation and innovation. We chose this indicator because one of the main objectives of SDG 9 is to upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean technologies. Indeed, one of the official SDG 9 indicators is CO2 emission per unit of value added, which is closely related to our indicator of CO2 intensity measuring the amount of CO2 emitted in the generation of one dollar's worth of product.

Too Little Too Late
CO2 intensity in 2050 is reduced to 20% of the levels emitted in the year 2000.

Giant Leap
CO2 intensity is massively reduced, reaching the essential negative intensity levels by the 2040s as more carbon is drawn down than emitted.

Key insights
While all three scenarios show a projected decline in CO2 intensity, the Too Little Too Late scenario clearly fails to achieve the red or green thresholds by 2050. The Giant Leap scenario demonstrates the greatest improvement in the reduction of CO2 intensity, dropping down to negative levels by 2042. This is eight years earlier than when modelled under the energy turnaround alone, largely due to rapid technological advances and a massive injection of investment in renewable energy technologies, alongside a fair and equitable decrease in resource consumption, and optimised efficiencies.

Earth4All indicator for Sustainable Cities and Communities (SDG 11)



Scenario outcomes for emissions per person

For SDG 11 on sustainable cities and communities, we have chosen the indicator of emissions per person. This is not to imply that this is the only measure of sustainable cities and communities. However, per capita emissions is an important indicator because cities account for over 70% of global greenhouse gas emissions.[75]

Too Little Too Late
Annual CO2 emissions per person begin to trend downwards from current levels of 4.5 tonnes to 1.9 tonnes by 2050. Globally, 16.7 billion tonnes of carbon are emitted annually in 2050.

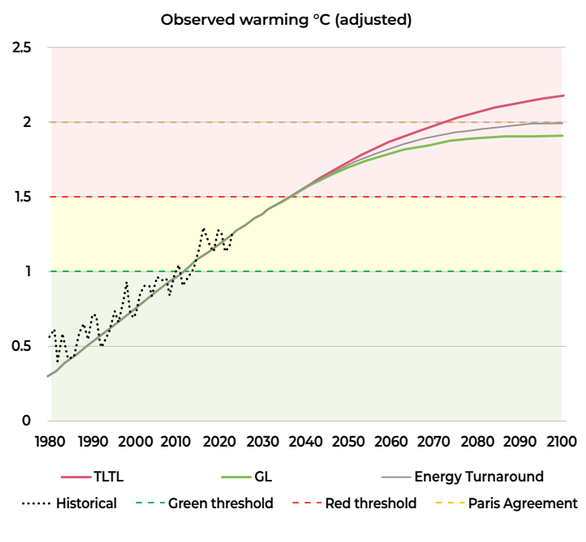
Giant Leap
Annual CO2 emissions per person are reduced dramatically, reaching essential negative emission levels by 2044.

Key insights
In the Giant Leap we manage to hit the desired green threshold for emissions per person by the early 2040s with a continuously improving trend, whereas in the Too Little Too Late scenario the less-ambitious red threshold is barely met by 2050. We see a downward trend in CO2 emissions in all three scenarios. However, only the energy turnaround and the Giant Leap scenario bring us to the green threshold of negative emissions by 2050. The Giant Leap scenario enables us to reach negative emissions more than five years earlier than the energy turnaround alone.

In the Giant Leap by 2050, 0.58 tonnes of carbon are drawn down annually per person. This means that a total of 5 billion tonnes of carbon are drawn down globally in 2050. This is in stark contrast with the Too Little Too Late scenario, which results in 16.7 billion tonnes of carbon emitted globally in 2050.

[75] https://www.un.org/sustainabledevelopment/cities/

Earth4All indicator for Climate Action (SDG 13)



Scenario outcomes for observed warming

To assess progress towards SDG 13 on climate action, we have used the indicator of observed warming in °C, simulated to 2100. As per the Paris Agreement of 2015, we have used 1.5°C as the red threshold. This reflects the agreed goal to "substantially reduce global greenhouse gas emissions to limit the global temperature increase in this century to 2 degrees Celsius while pursuing efforts to limit the increase even further to 1.5 degrees".[76] The green threshold is 1°C, which is considered the safe and just Earth system boundaries level, based on "minimizing likelihoods of triggering climate tipping elements; maintaining biosphere and cryosphere functions; and accounting for… climate variability".[77]

Too Little Too Late
Global warming continues at alarming rates, exceeding the Paris Agreement target of 2°C of warming in 2072.

Giant Leap
Global warming plateaus below 2°C by 2070.

Key insights
None of our scenarios are projected to reach the green or even the red threshold. However, although similar impacts exist in the scenarios between 2020 and 2070, global warming eventually plateaus below 2°C under the Giant Leap and could give a chance to humanity to thrive again.

The Too Little Too Late scenario results in warming exceeding the Paris Agreement level of 2°C. Sea levels will continue to rise, there will be increasing ocean acidity and decreasing oxygen levels, biomes will shift forcing species to relocate, and droughts, wildfires and floods will lead to serious impacts on humans and ecological systems

Even in the Giant Leap, the safe and just Earth boundary of 1°C, surpassed in 2014, continues to be exceeded; however, this warming trend is halted in the future rather than continuing on an increasingly devastating trajectory.

[76] https://www.un.org/en/climatechange/paris-agreement
[77] https://www.nature.com/articles/s41586-023-06083-8

The reality of overshooting the green and red thresholds in both scenarios give serious cause for concern regarding the lack of planetary emergency plans in place at this time to address climate change and predicted growing shocks and stresses.

Significant adaptation measures will be necessary in both scenarios to ensure human wellbeing. In the Too Little Too Late scenario, massive adaptation efforts are required but implementing them will be very difficult because wellbeing is lower and social tensions increase, leading to higher policy resistance. By contrast, the synergistic effects of the Giant Leap help to improve wellbeing and lower social tensions. In addition, governance is more effective and adaptation measures can be more effectively implemented, positively affecting socio-economic development and wellbeing even in an increasingly uncertain and difficult environment.

4.2. The policy interventions needed for the energy turnaround

This turnaround must address the specific challenges faced by low- and middle-income countries when transitioning to clean energy, because they often pay more for electricity, "cannot access clean energy projects, and are locked into fossil fuel dependency".[78] This is exacerbated by the fact that the "top 10% of the richest in the world account for more than half of all emissions". In addition, "within-country inequality in carbon emissions is now greater than between-country inequality".[79]

At the outset it is extremely important to spotlight the continued resistance of the international community to address these systemic challenges and to truly shift away from burning fossil energy, the number one cause of human-made climate change. The lack of willingness of governments to address the need to transition to clean energy immediately was brought into sharp relief at the recent gathering of the G20 in Goa. Since the G20 countries collectively account for more than three quarters of global emissions and GDP, their cumulative effort to decarbonise is crucial in the climate battle. However, they could not reach agreement on the urgency of reducing the use of fossil fuels. Instead, countries preferred to focus on carbon capture technology. Just as worryingly, governments could not agree on the tripling of renewable energy capacity by 2030. In fact, Saudi Arabia, Russia, China, South Africa and Indonesia specifically opposed the goal of tripling renewable energy capacity this decade.[80]

In this section, we highlight the policy interventions that are necessary to ensure the energy turnaround:

- Triple investment in renewables to at least $4 trillion per year and ensure comparable investment in energy efficiency.
- Commit to increasing concessional climate finance.
- Make renewable energy affordable by redirecting fossil fuel subsidies, which currently amount to $0.5 trillion per year.
- Support a global price on carbon by reaching an internationally agreed price floor to significantly accelerate the world's transition to renewable energy sources and ensure equitable access to energy for all.

Investment in renewables must be tripled and energy efficiency must be intensified

A report prepared for India's G20 presidency estimated the cost of the energy transition at $4 trillion per year globally and stressed the need for

[78] https://www.worldbank.org/en/news/feature/2023/05/16/breaking-down-barriers-to-clean-energy-transition
[79] https://blog.frontiersin.org/2023/04/24/jayati-ghosh-its-not-just-analysis-its-a-call-for-action/
[80] https://www.ft.com/content/fd30b0d2-2990-4531-9ed3-e91db0f4e47e
[81] https://www.ft.com/content/fd30b0d2-2990-4531-9ed3-e91db0f4e47e
[82] https://www.imf.org/en/News/Articles/2023/02/28/sp022823-scaling-up-climate-finance-for-emerging-markets-and-developing-economies

increased climate finance for low- and middle-income countries.[81] Official World Bank figures indicate that in 2020, renewable energy did in fact dominate climate finance. The share going to renewable energy in mitigation finance for the past decade is even higher at 70%.[82] While a good start, it is nowhere near enough. We support the UN Secretary-General in his call for a tripling of public and private investments in renewable energy to at least $4 trillion per year.[83] We also highlight that according to the UNCTAD World Investment Report 2023, low-income countries receive far less foreign direct investment in sustainable energy than in high-income countries.[84] Low-income countries need annual renewable energy investments of about $1.7 trillion but in 2022 they only received $544 billion. We also emphasise that climate investment does not always flow towards climate mitigation or adaptation, and in particular not to renewables or energy efficiency projects. A recent Reuters special report found that large sums of reported climate finance were going to projects that had absolutely nothing to do with climate (e.g. chocolate stores in Italy, hotel expansion in Haiti, film projects in Belgium and, most worryingly, Japanese financing of coal plants in Bangladesh and airport expansion in Egypt).[85] The underlying problem is that the original climate pledges made in 2009 are not governed by official guidelines as to which activities count as climate finance.

Tripling investment in renewables must also be accompanied by increased global progress on energy efficiency. The latter is essential if we are to double the rate of improvement in energy efficiency globally by 2030 as called for by SDG 7.3. Currently the world is not on track with the rate of energy intensity improvement having dropped to 0.6% in 2020, in large part due to COVID-19.[86] While this figure is expected to improve, to make up for lost time, the annual improvements in energy intensity must average 3.4% if we are to meet SDG 7.3 by 2030.[87]

[84] https://unctad.org/news/unctad-calls-urgent-support-developing-countries-attract-massive-investment-clean-energy

[85] https://www.reuters.com/investigates/special-report/climate-change-finance/

[86] https://energy.economictimes.indiatimes.com/news/renewable/world-not-on-track-to-achieve-sustainable-development-goal-for-energy-by-2030-report/100795564?redirect=1

[87] https://press.un.org/en/2023/ecosoc7136.doc.htm

Commit to increasing concessional climate finance

The Intergovernmental Panel on Climate Change (IPCC) estimates that the current level of climate finance spending is at about $630 billion. This is just a fraction of what is really needed – and very little goes to low- and middle-income countries.[88] In addition to broken climate finance promises, donor governments have actually overestimated their spending, claiming to have mobilised $83.3 billion in 2020 when the actual value was at most $24.5 billion.[89] On top of this, donor countries are repurposing up to one third of official aid contributions as climate finance rather than putting forward new and additional money.[90]

Besides overestimating their spending, donor governments are supplying the bulk of their climate finance commitments in the form of loans rather than grants. More than half of all climate finance to the world's poorest countries is provided as loans, adding to the debt burdens of already heavily indebted countries.

The reality is that the flow of private investment is not only inadequate (approximately $14 billion annually for climate mitigation efforts), the actual distribution of climate finance is skewed, with investment directed primarily to Asian and middle-income countries as opposed to the lowest-income countries in sub-Saharan Africa, despite their significantly greater vulnerability to climate change.[91]

And there is of course the continued investment in fossil fuels by the World Bank. The World Bank and all of the multilateral development banks (except the European Investment Bank) have a poor record in leveraging private investment for climate and development infrastructure and services. The World Bank, for example, has continued to invest over $16 billion of project finance in fossil fuels since the 2015 Paris Agreement. Reliance on private investment to fight climate change is deeply problematic when the fossil fuel industry has not only contributed most to the climate crisis, but has profiteered in the worst possible way and has now all but abandoned its net-zero commitments.

[88] https://www.imf.org/en/Blogs/Articles/2022/08/18/public-sector-must-play-major-role-in-catalyzing-private-climate-finance

[89] https://www.oxfam.org/en/press-releases/rich-countries-continued-failure-honor-their-100-billon-climate-finance-promise

[90] https://www.oxfam.org/en/press-releases/rich-countries-continued-failure-honor-their-100-billon-climate-finance-promise

[91] https://www.imf.org/-/media/Files/Publications/REO/AFR/2023/April/English/ClimateNote.ashx

Make renewable energy affordable by redirecting fossil fuel subsidies

Government subsidies to fossil fuels are one of the biggest obstacles to the energy turnaround. Each year, governments around the world invest $0.5 trillion into artificially lowering the price of fossil fuels. The IMF has found that prices for fossil fuels were "at least 50% below their true costs for 99% of coal, 52% of diesel and 47% of natural gas in 2020". It further concluded that "fossil fuel industry benefits from subsidies of $11m every minute", with five countries responsible for two thirds of the subsidies: China, the US, Russia, India and Japan.[92] Currently, governments spend three times more on fossil fuel subsidies than they invest in renewables. This highlights the extent to which government intervention is skewing prices – and therefore market incentives – in favour of fossil fuels, rather than against them.[93]

The inequity is that while billions of people are suffering from high energy prices, the oil and gas industry is actually making billions in windfall profits from a distorted market, which the UN Secretary-General refers to as scandalous.[94] These profits are also being made on the back of growing energy poverty, thus creating greater inequalities across our societies and a risk towards unstable democracies. Without action, subsidies will rise to $6.4 trillion in 2025.[95] The first step to creating viable sustainable energy and electricity markets is redirecting these subsidies[96] and windfall profits, freeing up trillions of dollars for investment in the shift towards renewables.

There is another important equity issue with regard to fossil fuel subsidies, as with agriculture subsidies. Namely, in many low-income countries, most of the subsidies that lead to lower market prices for oil and gas are often intended to help the poor. These subsidies must be redirected towards renewable energy pathways that are fair and equitable.

Governments must support a global price on carbon and bridge the energy access gap

Another important barrier to the energy turnaround is the lack of agreement on a fair carbon price that takes into consideration the damage incurred by greenhouse gas emissions. An internationally agreed price floor for carbon could significantly accelerate the world's transition to renewable energy sources. Despite the effectiveness of this tool to redirect spending towards renewables and other low-carbon practices, many countries fear a loss of international competitiveness, notably in high-emission sectors. We support an international carbon price floor with tiered price floors based on income levels.[97] Although not a panacea, carbon pricing is an essential part of mitigation efforts to unlock the trillions of dollars in private capital necessary to reach emissions reduction targets.[98]

A further important priority action for governments is to urgently bridge the energy access gap. The International Energy Agency estimates that without a massive increase in investment, 1.9 billion people will be without clean cooking and 660 million people without electricity access in 2030.[99] In addition to increased foreign investment flows, debt relief must be accelerated to increase low-income countries' fiscal space to make the domestic investments necessary for a just and clean energy transition.

[92] https://www.theguardian.com/environment/2021/oct/06/fossil-fuel-industry-subsidies-of-11m-dollars-a-minute-imf-finds

[93] https://monthlyreview.org/2022/07/01/climate-imperialism-in-the-twenty-first-century/

[94] https://www.un.org/sg/en/content/sg/statement/2022-05-18/secretary-generals-video-message-the-launch-of-the-world-meteorological-organization%E2%80%99s-state-of-the-global-climate-2021-report-scroll-down-for-languages

[95] https://www.theguardian.com/environment/2021/oct/06/fossil-fuel-industry-subsidies-of-11m-dollars-a-minute-imf-finds

[96] https://www.clubofrome.org/wp-content/uploads/2022/08/Earth4All_Deep_Dive_Ahmed.pdf

[97] https://www.imf.org/en/Blogs/Articles/2022/05/19/blog-why-countries-must-cooperate-on-carbon-prices

[98] www.weforum.org/press/2023/01/carbon-pricing-standards-needed-to-accelerate-green-energy/

[99] https://energy.economictimes.indiatimes.com/news/renewable/world-not-on-track-to-achieve-sustainable-development-goal-for-energy-by-2030-report/100795564?redirect=1

IV. CONCLUSIONS

For the first time, we have used our Earth4All system dynamics model to examine how the five Earth4All extraordinary turnarounds influence SDG progress from now to 2050. We conclude that we can achieve SDGs and create a world more resilient to future shocks and stresses if we do things differently. This means implementing a fair yet radical transformation to support wellbeing economies and a thriving biosphere. But action must start now, at a scale never seen before.

The Earth4All extraordinary turnarounds must be implemented simultaneously if we are to achieve the Giant Leap towards the SDGs. One of the novel features of our integrated systems modelling approach is that economic, demographic, ecological and social drivers are fundamentally interconnected and give us a vision of what is possible in the long term. We explored SDG progress on the basis of one extraordinary turnaround at a time and we found that, when taken individually, the turnarounds do not get us anywhere near the Giant Leap trajectory. This reinforces the critical point that the Giant Leap for the SDGs can only be attained if we act simultaneously on all five extraordinary turnarounds and operationalise all of the policy interventions that we have identified.

We recognise that many of the policy interventions for each of the five turnarounds are well known. These interventions are all elaborated in our 2022 book *Earth for All: A Survival Guide for Humanity* and previous papers and reports published by the Earth4All partners.[100,101]

In this report, we have adapted our policy interventions to relate specifically to the results of our SDG modelling work. Against that backdrop, the new insight that we bring to the SDG Summit is that governments must implement all of these policy interventions simultaneously, starting well before 2030 if we are to achieve the SDGs by 2050 and get close to an Earth for all at this time when humanity is facing its greatest existential risk. This is an unfathomable challenge but our analysis shows that if we are to achieve the Giant Leap by 2050, we must do things in a radically different way. Table 2 provides an overview of the policy interventions necessary to achieve a Giant Leap for all the SDGs – the only trajectory that enables humanity to get closer to thriving rather than just surviving.

The reality of overshooting the green and red thresholds for climate action under SDG 13 in both the Too Little Too Late and Giant Leap scenarios is extremely worrying considering the lack of global and national emergency plans in place at this time to address rapidly worsening climate change and predicted growing shocks and stresses. It is time to heed the calls of UN Secretary-General António Guterres to put in place the policy interventions and system shifts necessary to address today's planetary emergency.

[100] https://www.stockholmresilience.org/publications/publications/2018-10-17-transformation-is-feasible---how-to-achieve-the-sustainable--development-goals-within-planetary-boundaries.html

[101] https://www.clubofrome.org/publication/the-planetary-emergency-plan/

Table 2 – Overview of all the policy interventions necessary to achieve a Giant Leap for the SDGs

Poverty	Inequality	Empowerment	Food	Energy
1. Expand the fiscal space of lower-income countries. 2. Transform the current global financial architecture to expedite debt relief and improve allocation of SDRs. 3. Transform global trade dependencies to reduce trade deficits in low-income countries. 4. Improve access to knowledge, technology and leapfrogging. 5. Develop new economic indicators.	1. Stronger progressive taxation on both income and wealth for individuals and corporations. 2. Strengthened labour rights and trade union negotiating power. 3. Safety nets and innovation nets to share prosperity and provide security, such as the universal basic dividend.	1. Recognise that gender equality is essential for economic prosperity and social cohesion. 2. Massively scale up investment to meet 2030 education targets and guarantee the right to education for women and girls. 3. Ensure gender equality in leadership positions in public and private bodies. 4. Guarantee universal social protection and adequate universal pension systems.	1. Remove perverse agriculture subsidies. 2. Food production must shift from industrial to sustainable and regenerative agricultural practices. 3. Localised consumption, food sovereignty and farmworker rights must be prioritised and protected. 4. Efficiency must be improved across the supply chain	1. Investment in renewables and efficiency must be tripled. 2. Climate financing must be provided as concessional grants, not as loans. 3. Make renewable energy affordable by redirecting fossil fuel subsidies. 4. Support a global price on carbon and guarantee access to clean, safe and affordable energy for all.

BIBLIOGRAPHY, AUTHORS, ABOUT FEPS & PARTNERS

BIBLIOGRAPHY

Ahmed, N. (August, 2022). The clean energy transformation: a new paradigm for social progress within planetary boundaries. Earth4All. https://www.clubofrome.org/wp-content/uploads/2022/08/Earth4All_Deep_Dive_Ahmed.pdf

Balaji, M. & Arshinder, K. (2016). Modeling the causes of food wastage in Indian perishable food supply chain. Resources, Conservation and Recycling, 114, 153-167. https://www.sciencedirect.com/science/article/abs/pii/S0921344916301902

Berry, C. (June 12, 2023). Universal basic dividend as a form of welfare. UCL IIPP Blog. https://medium.com/iipp-blog/universal-basic-dividend-as-a-form-of-welfare-e11ed4349b07

Bivens, J., & Kandra, J. (October 4, 2022). CEO pay has skyrocketed 1,460% since 1978. Economic Policy Institute. https://www.epi.org/publication/ceo-pay-in-2021/

Bojek, P. (July 11, 2023). Energy System: Renewables. IEA. https://www.iea.org/energy-system/renewables

Brennan, S. (April 24, 2023). Jayati Ghosh – It's not just analysis, it's a call for action. Frontiers: Science News. https://blog.frontiersin.org/2023/04/24/jayati-ghosh-its-not-just-analysis-its-a-call-for-action/

Callegari, B., & Stoknes, P. E. (March, 2023). People and Planet: 21st- century sustainable population scenarios and possible living standards within planetary boundaries. Earth4All. https://earth4all.life/wp-content/uploads/2023/04/E4A_People-and-Planet_Report.pdf

Carrington, D. (September 14, 2021). Nearly all global farm subsidies harm people and planet – UN. The Guardian. https://www.theguardian.com/environment/2021/sep/14/global-farm-subsidies-damage-people-planet-un-climate-crisis-nature-inequality

Carrington, D. (October 6, 2021). Fossil fuel industry gets subsidies of $11m a minute, IMF finds. The Guardian. https://www.theguardian.com/environment/2021/oct/06/fossil-fuel-industry-subsidies-of-11m-dollars-a-minute-imf-finds

Chateau, J., Jaumotte, F., & Schwerhoff, G. (May 19, 2022). Why Countries Must Cooperate on Carbon Prices. IMF Blog. https://www.imf.org/en/Blogs/Articles/2022/05/19/blog-why-countries-must-cooperate-on-carbon-prices

Coalition of Immokalee Workers. (January 3, 2017). UN expert: FFP "must be considered an international benchmark" in fight against modern-day slavery! Coalition of Immokalee Workers. https://ciw-online.org/blog/2017/01/un-expert-ffp/

Collste, D., Randers, J., Goluke, U., Stoknes, P. E., Cornell, S., & Rockström, J. (2018). The Empirical Bases for the Earth3 Model: Technical Notes on the Sustainable Development Goals and Planetary Boundaries. EarthArXiv. https://eartharxiv.org/repository/object/1200/download/2736/

Collste, D., Spittler, N., & Barbour, F. (2023). Policy coherence beyond the 2030 Agenda: Global Trajectories towards 2050. https://doi.org/10.31219/osf.io/sb2na

Collste, D., Cornell, S. E., Randers, J., Rockström, J., & Stoknes, P. E. (2021). Human well-being in the Anthropocene: Limits to growth. Global Sustainability, 1–17. https://doi.org/10.1017/sus.2021.26

Ding, H., Markandya, A., Feltran-Barbieri, R., Calmon, M., Cervera, M., Duraisami, M., Singh, R., Warman, J., & Anderson, W. (August 25, 2021). Repurposing Agricultural Subsidies to Restore Degraded Farmland and Grow Rural Prosperity. World Resources Institute. http://www.wri.org/research/farm-restoration-subsidies

Dixson-Declève, S., Gaffney, O., Ghosh, J., Randers, J., Rockstrom, J., & Stoknes, P. E. (2022). Earth for All: A Survival Guide for Humanity. New Society Publishers.

Dixson-Declève, S., Gaffney, O., Ghosh, J., Randers, J., Rockström, J., & Stoknes, P. E. (September, 2022). Earth for All: A Survival Guide for Humanity – Executive Summary. https://earth4all.life/wp-content/uploads/2023/03/Earth4All_Exec_Summary_EN.pdf

Dwyer, O. (March 13, 2023). Food waste makes up "half" of global food system emissions. Carbon Brief. https://www.carbonbrief.org/food-waste-makes-up-half-of-global-food-system-emissions/

European Commission Directorate-General for Health and Food Safety. (January, 2018). Market study on date marking and other information provided on food labels and food waste prevention. Publications Office of the European Union. https://op.europa.eu/en/publication-detail/-/publication/e7be006f-0d55-11e8-966a-01aa75ed71a1/language-en

Fanning, A. L., O'Neill, D. W., Hickel, J., & Roux, N. (2021). The Social Shortfall and Ecological Overshoot of Nations. Nature Sustainability, 5, 26–36. https://www.nature.com/articles/s41893-021-00799-z

Georgieva, K., & Adrian, T. (August 18, 2022). Public Sector Must Play Major Role in Catalyzing Private Climate Finance. IMF Blog. https://www.imf.org/en/Blogs/Articles/2022/08/18/public-sector-must-play-major-role-in-catalyzing-private-climate-finance

Ghosh, J., Chakraborty, S., & Debamanyu, D. (July 1, 2022). Climate Imperialism in the Twenty-First Century. Monthly Review. https://monthlyreview.org/2022/07/01/climate-imperialism-in-the-twenty-first-century/

Ghosh, J., & Fries, L. (July 13, 2023). Subsidizing Chemical Fertilizers is Counterproductive. Institute for New Economic Thinking. https://www.ineteconomics.org/perspectives/blog/subsidizing-chemical-fertilizers-is-counterproductive

Global Education Monitoring Report Team. (September, 2020). Act now: reduce the impact of COVID-19 on the cost of achieving SDG 4. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000374163

Guterres, A. (May 18, 2022). Secretary-General's video message on the launch of the World Meteorological Organization's State of the Global Climate 2021 Report. United Nations. https://www.un.org/sg/en/content/sg/statement/2022-05-18/secretary-generals-video-message-the-launch-of-the-world-meteorological-organization%E2%80%99s-state-of-the-global-climate-2021-report-scroll-down-for-languages

High Level Panel of Experts on Food Security and Nutrition. (July, 2022). Critical, Emerging and Enduring Issues for Food Security and Nutrition. Food and Agriculture Organization of the United Nations. https://www.fao.org/3/cc1867en/cc1867en.pdf

IFAD. (March 7, 2022). These numbers prove that rural women are crucial for a better future. But they're not getting what they need to succeed. IFAD. https://www.ifad.org/en/web/latest/-/these-numbers-prove-that-rural-women-are-crucial-for-a-better-future

International Monetary Fund. (April, 2023). Closing the Gap: Concessional Climate Finance and Sub-Saharan Africa. Regional Economic Outlook: Sub-Saharan Africa—The Big Funding Squeeze. International Monetary Fund. https://www.imf.org/-/media/Files/Publications/REO/AFR/2023/April/English/ClimateNote.ashx

La Via Campesina. (November 22, 2021). The 1996 Rome Food Sovereignty Declaration in Postcards. La Via Campesina. https://viacampesina.org/en/the-1996-rome-food-sovereignty-declaration-in-postcards/

Li, B. (February 27, 2023). Scaling up Climate Finance for Emerging Markets and Developing Economies. International Monetary Fund. https://www.imf.org/en/News/Articles/2023/02/28/sp022823-scaling-up-climate-finance-for-emerging-markets-and-developing-economies

Mao, B. (August 2, 2022). Low-income communities lack access to clean water. It's time for change. World Economic Forum. https://www.weforum.org/agenda/2022/08/access-clean-water-inequality-financing/

Millennium Institute. (2021). iSDG documentation. Millennium Institute. https://isdgdoc.millennium-institute.org/en/

Mooney, A. (July 22, 2023). G20 deal on fossil fuels blocked after Saudi opposition. Financial Times. https://www.ft.com/content/fd30b0d2-2990-4531-9ed3-e91db0f4e47e

Oxfam International. (June 5, 2023). Rich countries' continued failure to honor their $100 billon climate finance promise threatens negotiations and undermines climate action. Oxfam International. https://www.oxfam.org/en/press-releases/rich-countries-continued-failure-honor-their-100-billon-climate-finance-promise

Project ALTER. (July 31, 2019). Universal Basic Dividend vs. Income. DataSeries. https://medium.com/dataseries/universal-basic-dividend-vs-income-19f04f7136ac

Randers, J., Rockström, J., Stoknes, P. E., Golüke, U., Collste, D., & Cornell, S. (October 17, 2018). Transformation is feasible: How to achieve the Sustainable Development Goals within Planetary Boundaries. Stockholm Resilience Centre. https://www.stockholmresilience.org/

Randers, J., Rockström, J., Stoknes, P.-E., Goluke, U., Collste, D., Cornell, S. E., & Donges, J. (2019). Achieving the 17 Sustainable Development Goals within 9 planetary boundaries. Global Sustainability, 2, e24. https://doi.org/10.1017/sus.2019.22

Rockström, J., Gupta, J., Qin, D., Lade, S. J., Abrams, J. F., Andersen, L. S., Armstrong, D. I., Bai, X., Bala, G., Bunn, S. E., Ciobanu, D., DeClerck, F., Ebi, K. L., Gifford, L., Gordon, C., Hasan, S., Kanie, N., Lenton, T. M., Loriani, S., & Liverman, D. (2023). Safe and just Earth system boundaries. Nature, 619, 102–111. https://www.nature.com/articles/s41586-023-06083-8

Rumney, E., Casado Sanchez, I., Dowdell, J., Nakayama, M., Murakami, S., & Takenaka, K. (June 1, 2023). Rich nations say they're spending billions to fight climate change. Some money is going to strange places. Reuters. https://www.reuters.com/investigates/special-report/climate-change-finance/

Sachs, J. D., Lafortune, G., Fuller, G., & Drumm, E. (2023). *Sustainable Development Report 2023: Implementing the SDG Stimulus*. Dublin University Press.

Schmidt-Traub, G., Kroll, C., Teksoz, K., Durand-Delacre, D., & Sachs, J. (2017). National baselines for the Sustainable Development Goals assessed in the SDG Index and Dashboards. Nature Geoscience, 10(8), 547-555. https://www.nature.com/articles/ngeo2985

Schoch, M., Tetteh Baah, S. K., Lakner, C., & Friedman, J. (December 8, 2022). Half of the global population lives on less than US$6.85 per person per day. World Bank Blogs. https://blogs.worldbank.org/developmenttalk/half-global-population-lives-less-us685-person-day

Shen, G., Li, Z., Hong, T., Ru, X., Wang, K., Gu, Y., Han, J., & Guo, Y. (April 5, 2023). The status of the global food waste mitigation policies: experience and inspiration for China. Environment, Development and Sustainability. https://doi.org/10.1007/s10668-023-03132-0

Stancu, V., Haugaard, P., & Lähteenmäki, L. (2016). Determinants of consumer food waste behaviour: two routes to food waste. Appetite, 96, 7–17. https://www.sciencedirect.com/science/article/abs/pii/S0195666315003992?via%3Dihub

Stockholm Resilience Centre. (n.d.). The nine planetary boundaries. Stockholm Resilience Centre. https://www.stockholmresilience.org/research/planetary-boundaries/the-nine-planetary-boundaries.html

The World Bank. (December 6, 2022). Debt-Service Payments Put Biggest Squeeze on Poor Countries Since 2000. The World Bank. https://www.worldbank.org/en/news/press-release/2022/12/06/debt-service-payments-put-biggest-squeeze-on-poor-countries-since-2000

The World Bank. (May 16, 2023). Breaking Down Barriers to Clean Energy Transition. The World Bank. https://www.worldbank.org/en/news/feature/2023/05/16/breaking-down-barriers-to-clean-energy-transition

The World Bank. (June 15, 2023). Trillions Wasted on Subsidies Could Help Address Climate Change. The World Bank. https://www.worldbank.org/en/news/press-release/2023/06/15/trillions-wasted-on-subsidies-could-help-address-climate-change

UNDP. (n.d.). Sustainable Development Goals: Quality Education. UNDP. https://www.undp.org/sustainable-development-goals/quality-education

United Nations. (n.d.). Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. UN Sustainable Development Goals. https://sdgs.un.org/goals/goal4

United Nations. (n.d.). Goal 11: Make cities inclusive, safe, resilient and sustainable. UN Sustainable Development Goals. https://www.un.org/sustainabledevelopment/cities/

United Nations. (n.d.). Realisation of the equal enjoyment of the right to education by every girl. Office of the High Commissioner for Human Rights. Accessed August 6, 2023. https://www.ohchr.org/sites/default/files/Documents/Issues/Women/WRGS/ReportGirlsEqualRightEducation.pdf

United Nations. (n.d.). The Paris Agreement. United Nations. https://www.un.org/en/climatechange/paris-agreement

United Nations. (September 18, 2022). Closing gender pay gaps is more important than ever. UN News. https://news.un.org/en/story/2022/09/1126901

United Nations. (January 23, 2023). The world is failing 130 million girls denied education: UN experts. Office of the High Commissioner for Human Rights. https://www.ohchr.org/en/press-releases/2023/01/world-failing-130-million-girls-denied-education-un-experts

World Economic Forum. (January 19, 2023). Carbon Pricing Standards Needed to Accelerate Green Energy. World Economic Forum. http://www.weforum.org/press/2023/01/carbon-pricing-standards-needed-to-accelerate-green-energy/

World Health Organisation. (October 24, 2022). Universal access to safe drinking water requires increased investment backed by strong government institutions - WHO, UNICEF, World Bank. World Health Organization. https://www.who.int/news/item/24-10-2022-universal-access-to-safe-drinking-water-requires-increased-investment-backed-by-strong-government-institutions--who--unicef--world-bank

WWF. (n.d.). Industries: Sustainable Seafood. WWF. https://www.worldwildlife.org/industries/sustainable-seafoodwnload/18.51d83659166367a9a16353/1539675518425/Report_Achieving%20the%20Sustainable%20Development%20Goals_WEB.pdf

N.B. Current footnotes that appear as URLs will be put in citation format for the final report in October

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Earth4All is a vibrant collective of leading economic thinkers, scientists and advocates, convened by The Club of Rome, the BI Norwegian Business School, the Potsdam Institute for Climate Impact Research and the Stockholm Resilience Centre. Earth4All builds on the legacies of *The Limits to Growth* and the Planetary Boundaries frameworks. *Earth for All: A Survival Guide for Humanity* was published in September 2022 and presents the results of a remarkable two-year research collaboration.

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This report, *SDGs for All: Strategic Scenarios*, analyses how policy affects future progress towards the United Nations Sustainable Development Goals (SDGs) using Earth4All's modellable indicators for each SDG. The Earth4All partnership finds that the apathetic and insufficient actions of governments and other policymaking institutions have made it impossible to meet the original 2030 target date for achieving the SDGs. And if governments and institutions continue business as usual, more than two thirds of the SDGs will remain unachieved as late as 2050 – a full generation overdue.

We conclude that the Giant Leap scenario for implementing the five extraordinary turnarounds simultaneously is the only way to achieve most of the SDGs by 2050. The Giant Leap is a battery of reforms that restructure society away from self-interest and towards selfless cooperation and repairing of the broken ecological systems our species depends on for basic necessities. The Giant Leap must be executed with urgency across every country, across five key domains of society. These five domains – the extraordinary turnarounds – encompass the 17 SDGs. The turnarounds are poverty, inequality, empowerment, food and energy, and each requires an extraordinary commitment to be successful.

In fact, the five turnarounds must be committed to and implemented simultaneously to achieve the Giant Leap. The world is in a polycrisis, experiencing multiple crises that intersect and compound and become much worse than the sum of their individual effects. Any solutions to this polycrisis must therefore address every crisis at once. The more people who are liberated from poverty, undernourishment, preventable disease, gender and income inequality, lack of access to education, unclean water and unsafe sanitation, the more they are able to help solve these problems further and avert collapse. The Giant Leap is therefore a synergistic mobilisation on five fronts – not against other nations and peoples, but for the survival of all nations and all peoples. No level of commitment is too high, especially from high-income countries – who must realise it is within only their capability, and therefore primarily their responsibility, to bring about the Giant Leap. This includes supporting radically more generous international loans and investments and grants and debt relief, more progressive taxation, stronger labour laws, greater public ownership of natural resources, expanded social services, expanded legal protections for women and minority groups, more sustainable food production, more renewable energy production, shorter supply chains and stronger emissions disincentives. Earth4All finds that these policies, implemented all together and all at once, represent humanity's best remaining hope for achieving the SDGs and thus conserving a habitable world.

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