UNU EHS

Interconnected Disaster Risks

Turning Over a New Leaf

2025

Contents

Executive summary

Climate change is intensifying, yet fossil fuel use and emissions are still reaching new heights.

Species are going extinct at unprecedented rates, yet we continue to destroy ecosystems.

More than two billion tonnes of household waste are produced each year and cause harm globally, yet the amount is projected to double by 2050.

Despite decades of warnings by scientists, new negative extremes make the news nearly every day. Scientists have also told us what needs to change: Stop using fossil fuels. Protect and restore ecosystems. Live sustainably.

Nevertheless, we are making fairly little progress towards such goals. This begs the question, if we know what we need to do, why aren't we doing it?

Previous editions of the *Interconnected Disaster Risks* report have analysed how the disasters we see are interconnected, and what risk tipping points we are going to reach if humanity continues to weaken the systems we all depend on. This year's edition seeks to pick up where the previous editions left off by asking the central question on many people's minds: how do we change course?

In doing so, it looks at five fundamental changes that are needed to truly make a difference:

1. **Rethink waste:** From trash to treasure
2. **Realign with nature:** From separation to harmony
3. **Reconsider responsibility:** From me to we
4. **Reimagine the future:** From seconds to centuries
5. **Redefine value:** From economic wealth to planetary health

This year's report, *Turning Over a New Leaf*, analyses what the world could look like if we make these changes, and what is preventing us from doing so.

Research has shown that the public currently disproportionally hears about a narrow slice of climate science: mostly from the natural sciences, and mostly negative projections. While these projections need to be taken seriously, and they may make attention-grabbing headlines, they often create fear and potential paralysis when the public feels doomed no matter what. Moreover, when we respond to negative projections, our natural reaction is to think about how to prevent them. This results in goals and targets such as "limiting climate change" or "preventing biodiversity loss". However, the report argues that we do not need to settle for just *stopping* the worst impacts. Instead, we can aim to actively create a world we would wish to live in.

What is preventing us from doing better?
Few people, if any, would say they desire a world with more risks and more destruction. Few people, if any, would argue for more plastic in rivers, more destroyed ecosystems or more inequality. Many would agree that we should reduce waste, protect nature, stop climate change, cooperate more effectively with others and prioritize what truly matters. Many of us are trying to make these kinds of changes already, but it can seem like an overwhelming challenge. You might already be recycling at home, taking a reusable bag to the store, donating to save wildlife or planting trees. But still, things seem to keep getting worse.

This is because many of our well-intentioned actions are in reality rather superficial fixes. Recycling is a valuable pursuit, but it does not get to the underlying question: Why is the supermarket full of plastic packaging? Donating to conservation efforts is undoubtedly a good thing, but does not address the underlying issue that we tend to treat nature like a commodity, and even our best efforts to protect it are often limited to specific areas where nature is allowed to thrive or a particular species we are fond of.

We cannot expect real change unless we explore the reasons behind our actions and question why we are doing what we are doing.

To use an analogy, if society was a tree, climate change and pollution would be the fruits of this tree. They are outcomes – visible events, behaviours and actions. But these fruits do not exist in isolation; they are supported by the branches and trunk, which are the structures of the system that maintain the tree. Structures can be tangible things, like infrastructure, or intangible, like laws and organizations. If these structures remain the same, the fruit stays the same, too. Even further down, the tree has roots that take nutrients from the soil to feed the trunk and give the system life. In this system, the soil represents our values and beliefs. The soil ultimately determines how healthy the tree can be. Similarly, our values determine the outcomes we see in the world, positive or negative. In keeping with the metaphor, rotten roots will produce rotten fruits.

Take plastic waste, for instance. When we see a river so clogged with plastic waste that it creates disastrous floods, we might criticize the waste management system and wish for more recycling. However, this would not be going deep enough, instead we need to **rethink waste**. The outcome of accumulating waste is maintained by the structures that allow it to exist in the first place, such as the concept of single-use items or mass production. Going even deeper you would notice that the goals of the system are to produce and consume as much as possible, driven by the assumption that material consumption is necessary for happiness and progress. This system is characterized as a linear production system, where we take raw materials from the Earth, make them into products, and then throw them away when we are finished with them, as if the Earth had endless resources to make new products and could absorb unlimited waste. This is obviously not true, and to change the outcome of plastic accumulating in rivers – we will need to change this linear system into something different.

How do we make a change?
Because our current assumptions create risks, real change can only occur when we address the problem at the root, questioning the values and assumptions that ultimately guide our societies.

This year's Interconnected Disaster Risks report developed a new theory to explain how truly transformative change can be achieved: the Theory of Deep Change (ToDC). Applying the theory involves the observation of existing outcomes, the identification of underlying root causes, a vision of a more desirable future and, based on this, the exploration of changes that could transform the system.

Applied to the example of waste, the Theory of Deep Change identifies the underlying values at play, namely our assumption that material consumption brings happiness, or that "new" things are better than old things, which leads us to accumulate more and more while discarding used items. As long as our system is grown from these assumptions, any measures created to deal with waste will struggle to be truly effective. Recycling can only help to a certain extent if we continue to produce ever-increasing volumes of garbage. In fact, research shows that having the option to recycle can even increase the amount of waste people produce.

If our definition of a more desirable future is a world without waste, we need to question the underlying beliefs of the system. If we would accept that resources are finite and precious, we would have different goals and create different structures than those we have today. We might, for example, value our current possessions more and try to extend their life. Aiming to do so would require different structures too. We may pass laws that mandate companies to offer repair for broken products, for instance, or to design them in such a way that parts can be replaced to keep them in use for as long as possible.

Inner and outer levers
Many of the changes we need to make are big, complex, whole-of-society changes. For this to happen, they need to occur at different levels. The Theory of Deep Change identifies which changes are most effective, namely those at the assumptions and structures levels of society. This is in contrast to many current efforts, which operate more on the surface, centred on altering only the outcomes of the existing systems without changing the system itself.

The Theory of Deep Change differentiates between two types of levers that have to come together to create deep and lasting change: **inner and outer levers**.

The most powerful levers act at the assumption level, to change our underlying beliefs and values; nurturing the soil from which to grow a new tree. Interventions to shift these assumptions are called **inner levers**. While assumptions are a powerful leverage point, on a societal level they may seem very difficult to change as it requires collective shifts in assumptions from many individuals. On the other hand, this is a change everyone has the power to make for themselves, and if enough individuals do so, it is extremely powerful. Collective shifts in assumptions do happen. The perception of smoking cigarettes, for instance, has changed dramatically over time. In the past, it was widely accepted and often glamorized, associated with higher social status in many cultures, and even with health benefits. However, as scientific studies in the middle of the 20th century began to expose serious health risks like lung cancer and heart disease, attitudes shifted. This change occurred both individually and collectively, owing to public health campaigns. Today, smoking is largely seen as a harmful habit, and the number of smokers is declining almost everywhere. When people today see old ads touting the benefits of smoking, they will likely wonder how society could possibly believe in this, showing that the change in assumptions truly took place.

While the most powerful leverage points are at the assumption level, changes also need to be made at the level of structures. These changes are called **outer levers**, and seemingly small changes in the structures of a society can spark imagination of what is possible and change reality. One of the main places where **outer levers** can be pulled for structural change is in our governance systems, such as laws, tax systems or subsidies. While **inner and outer levers** work best in unison, it is also possible that a change in one brings about a change in the other. The shift in attitudes towards smoking would not have been as successful without the enactment of new laws at multiple levels of government, for instance, which include measures such as strict regulation of smoking in public places, bans on tobacco advertising or mandatory warning labels on products.

Inner and outer levers can also work together when we **reconsider responsibility**. As humans, we tend to think about our own communities first when in fact many of the challenges we face affect the whole globe. This leads to many shortsighted actions that push negative consequences to other places; for example, when rich countries attempt to solve their trash disposal issues by exporting plastic waste to other countries, which frequently have much less ability to properly recycle it. This lack of global thinking and cooperation also leads to unilateral attempts by individuals, companies and countries to fix climate issues. There is, for instance, growing interest from scientists, governments and businesses in the research and deployment of solar geoengineering technologies such as spraying aerosols in the Earth's stratosphere to reflect sunlight and lower average global temperatures. However, potential impacts will likely vary across the globe, as the artificial cooling

will affect some regions more than others and there are uncertainties about the effects on regional weather patterns, and the provision of food and water. Their use would also likely concentrate power in the hands of a few major players, thereby increasing inequality.

Solar geoengineering is an example of a unilateral decision being made in one part of the world that would have far-reaching consequences for others. Worse still, solar geoengineering is a superficial fix to a known problem, climate change, to avoid committing to the real solution: phasing out fossil fuels. This cannot be accomplished by unilateral decision-making and self-serving behaviours, but will require cooperation and coordination on a global scale. To make this shift, we can pull an **inner lever** – shifting our assumptions to view ourselves not as isolated but as part of the global community, with a responsibility to care for the other people sharing the planet with us. **Outer levers** can be pulled in combination, to create international governance and commitments to work together to solve global problems.

We have made these kinds of changes before, for instance with the adoption and implementation of the Montreal Protocol in 1987, which regulates the production and consumption of substances depleting the ozone layer. The Montreal Protocol began with the recognition of a global problem and brought the world together to solve it. The agreement is often considered the most successful international environmental treaty in history: ratified by 197 countries, it is legally binding with respective penalties and comes with financial support for the implementation in developing countries. This example of both successful global cooperation and global solidarity for a common goal has led to steady improvements, with the ozone layer on track to make a full recovery by 2066.

It is easy to feel hopeless when confronted with the many interconnected risks our world faces today, the sources of which are so deeply rooted in our societies that they can seem impossible to overcome and difficult to imagine how we can change the outcome. But our systems are not set in stone, and human-made problems can be unmade. This report shows that it is possible to move beyond incremental changes and create a world that is not just free from disasters but also thriving. By redefining what we value and assume about the world, we can transform today's interconnected risks into opportunities for collective well-being and resilience. It is possible to radically imagine a better world, believe in our power to achieve it and turn over a new leaf.

People composting waste in Bogotá, Colombia. © Daniel Camargo / Pexels

Abbreviations

ASM	Action Scales Model
CEO	Chief Executive Officer
CIP	International Potato Center
EEA	European Environment Agency
EI	Energy Institute
FFFSR	Friends of Fossil Fuel Subsidy Reform
GDP	Gross Domestic Product
GNH	Gross National Happiness
IAI	International Aluminium Institute
IAEA	International Atomic Energy Agency
IEA	International Energy Agency
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
NCP	Nature's Contributions to People
OECD	Organisation for Economic Co-operation and Development
OPHI	Oxford Poverty and Human Development Initiative
SDGs	Sustainable Development Goals
ToDC	Theory of Deep Change
UKCEH	United Kingdom Centre for Ecology & Hydrology
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNODC	United Nations Office on Drugs and Crime
UNU-EHS	United Nations University Institute for Environment and Human Security
USEPA	United States Environmental Protection Agency
WBGU	German Advisory Council on Global Change
WHO	World Health Organization
WMO	World Meteorological Organization
WWF	World Wide Fund for Nature

Chapter 1

Introduction

Our world faces many risks driven by natural hazards and vulnerabilities. These are intensified by climate change, pollution, habitat and biodiversity loss, inequality and global interconnectivity. Science is clear that these risks are increasingly threatening people and the planet (IPBES, 2019; IPCC, 2023a). While probably no one would explicitly desire a world with even more risks and more adverse impacts, the negative trajectory continues despite the increasing amount of warning signals (Richardson and others, 2023; Lenton and others, 2023; UNU-EHS, 2023). These risks and the respective negative outcomes are often connected to widely shared ideas about how the world should work, such as the desire for constant economic growth and consumption, and are perpetuated by economic and political power structures that make it very difficult, but no less necessary, to overcome these challenges.

On our interconnected planet, striving for a better world means to engage in debate and dialogue on values and goals with people from diverse backgrounds so we may come to conclusions that we agree upon (UNODC, 2017). The United Nations Sustainable Development Goals (SDGs), for instance, represent one of the most comprehensive examples of a worldwide consensus of what a desirable society could look like. It implies that everyone and every country has a common responsibility for contributing to delivering the global vision. Similarly, in September 2024, UN Member States adopted a Pact for the Future that represents the most wide-ranging international agreement in many years (UN, 2024a). The Pact aims to increase efforts to reach the SDGs and the Paris Agreement on climate change, to include young people in decision-making, build stronger partnerships and to create and sustain peaceful, inclusive and just societies.

However, despite agreeing on these general principles, we are not necessarily making progress towards them. In 2023, both fossil fuel use and emissions hit record highs (EI, 2024), and it was the hottest year ever recorded (WMO, 2024). More than 2 billion tonnes of household waste are produced per year, a figure projected to reach 4 billion tonnes by 2050 (Chen and others, 2020; UNEP, 2024b). Around 95 per cent of Earth's surface has been altered (Kennedy and others, 2019) and around one million plant and animal species are threatened with extinction (IPBES, 2019). Despite declining inequality between countries in the last few decades, the gap remains substantial and is once again growing since 2020 (UN, 2020; UN DESA, 2024), while within-country inequality has been rising since the 1980s (Chancel and others, 2022). Of the 169 targets of the SDGs, only 17 per cent are on track and over one third are stagnating or even regressing (UN, 2023). It seems we are fighting an uphill battle, but this begs the question: why? If we all know that our world could be better, then what is stopping us from making the necessary changes and, more importantly, how can we overcome these challenges?

About the report

The 2025 *Interconnected Disaster Risks* report outlines five key changes to achieve a desirable future: **realigning with nature, rethinking waste** and resource use, **reconsidering our responsibilities** towards other people and communities, **reimagining the future** and their opportunities and **redefining value**. These five changes were initially identified in the 2023 edition as essential for avoiding risk tipping points in socioecological systems (UNU-EHS, 2023). They are further analysed and substantiated in this edition. **Chapter 2** reintroduces and expands on the changes through individual fact sheets that provide an overview of the risks of our current reality, the mindsets that underpin them and the potential avenues of transformation. **Chapter 3** provides the background and theoretical framing of the report, as well as our methodology. **Chapter 4** investigates the mental models that form how societies currently operate, while **Chapter 5** envisions examples of different and brighter futures. **Chapter 6** discusses actionable steps we can take to achieve a more desirable future, from actions that individuals can make to the structural changes necessary to transform our world for the better.

Chapter 2

Factsheets

Rethink waste

Reimagine the future

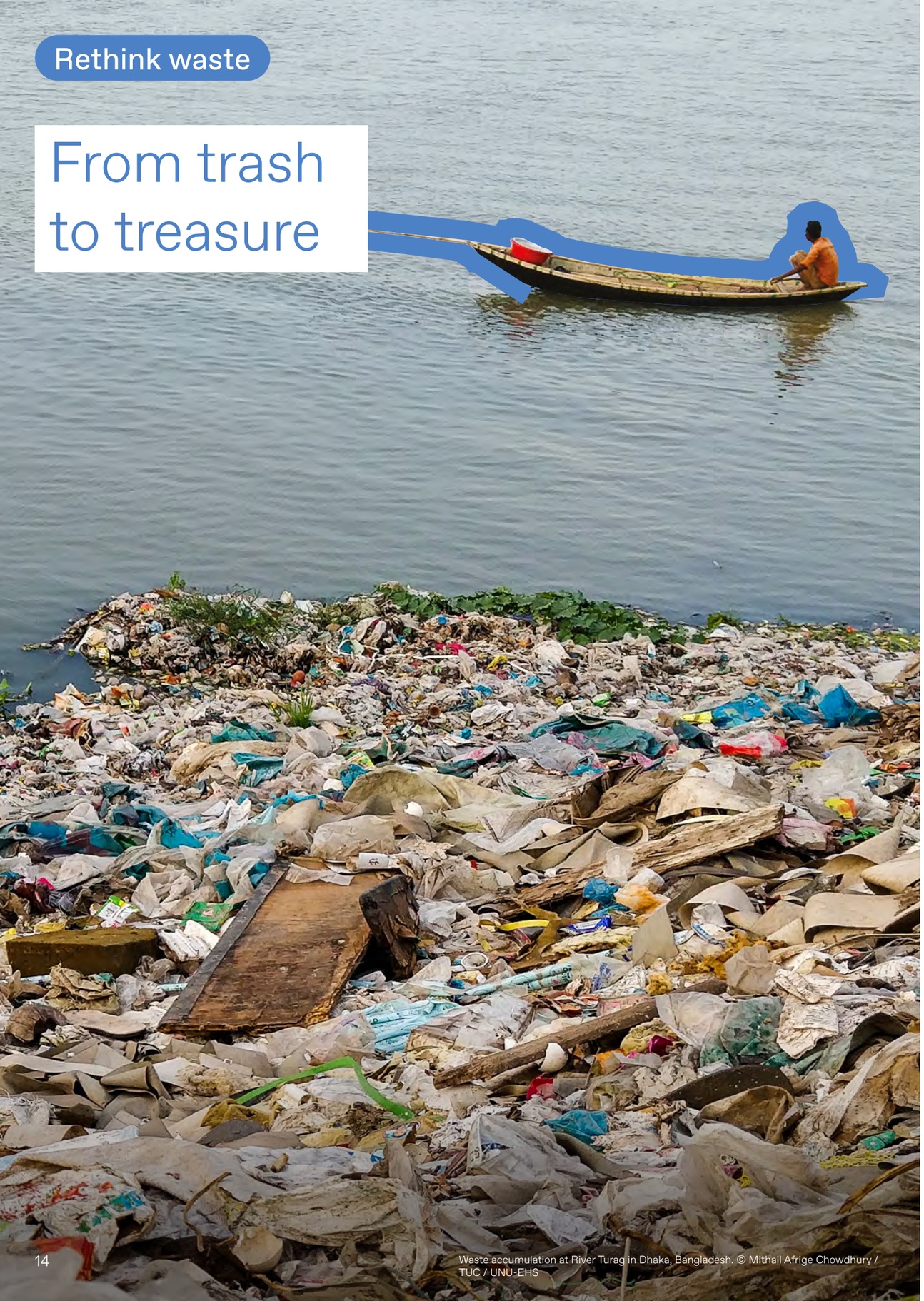
Realign with nature

Reconsider responsibility

Redefine value

Rethink waste

From trash to treasure



Waste accumulation at River Turag in Dhaka, Bangladesh. © Mithail Afrige Chowdhury / TUC / UNU-EHS

The way we use our planet's resources is unsustainable. Renewable resources are consumed faster than they can regenerate. For example, nutrient-rich soil, which takes hundreds of years to form, is being eroded faster than it can be replenished due to intensive farming practices. Not only are we using Earth's resources at an unsustainable rate, but they are also being wasted. Every year, we produce 2 billion tonnes of household trash, much of which is dumped in landfills or burned, polluting our environment.[1] Included in this waste are finite resources that are being drained and cannot be replenished. Clearly, these actions not only harm our planet but also endanger the future availability of resources. So why does it still happen?

We live in a system where we take raw materials from the Earth, use them or make them into products, and then throw them away when we are finished with them. This linear approach assumes that the Earth has endless resources and can absorb unlimited waste, which is not true. As a result, we waste valuable resources by carelessly discarding materials that are essentially finite and will one day be depleted. For instance, lithium is an extremely useful mineral, used mostly in rechargeable batteries like those in phones and electric cars, and for which demand is increasing.[2] Lithium is also a limited resource, with our current reserves estimated to be depleted by around 2050.[3] At the same time, it is projected that over 75 per cent of lithium mined by 2050 will end up in the garbage.[3] This is a prime example of the linear system in action – depleting lithium reserves while letting the lithium go to waste after it has been used.

Is there a way we can reimagine our current model of production and consumption? Can we design a system that keeps items in use, preserves our precious resources and protects our planet from pollution? What would such a new model look like?

Instead of the current linear model, we could adopt a "cradle-to-cradle" approach. Rather than taking materials and wasting them, we use them with care and consideration from the beginning and keep them in circulation. Everything is used to its maximum potential and serves as inputs for other processes, thereby challenging the very concept of waste. Composting, for instance, makes food and other organic materials back into nutrients for the soil. Additionally, since food and organic waste make up 44 per cent of global waste composition,[4] composting could help rejuvenate degraded soils and reduce the overall volume of waste we generate. This applies to other materials too, such as designing modular cell phones made of various independent pieces that can be interchanged, recycled and replaced to extend the phone's life significantly.

While these are good examples of individual solutions, it will take broader societal changes to achieve a true zero-waste lifestyle. However, some communities are already providing a model for how it can be done. For instance, the town of Kamikatsu, Japan, has been working since 2003 to eliminate as much waste as possible. The town has a recycling rate of around 80 per cent, in sharp contrast to the national average of 20 per cent.[5] Community members separate waste into 45 categories, some for composting, recycling, reuse or repair. The town also hosts a variety of zero-waste services, including an upcycled clothing store, a free clothing exchange system and a brewery that makes craft beer from agricultural waste.

Realizing that our resources are limited and redesigning processes for longer use are key to building a sustainable future. If we shift from a system that turns Earth's precious resources into trash to one that treasures them, we can create a world where both people and the environment can thrive. This change is not just possible – it is necessary to keep our planet healthy and sustainable for everyone.

Key numbers:

95%

less energy is needed to produce recycled aluminium compared to primary production[6]

7.4 million

tonnes of greenhouse gas emissions could be saved annually in the UK by keeping organic waste out of landfills[7]

59%

of all lithium-ion batteries were recycled globally in 2019[8]

[1] UNEP, 2024b
[2] Baum and others, 2022
[3] Lähdesmäki and others, 2023
[4] Kaza and others, 2018
[5] Tomoyuki, 2023
[6] IAI, 2020
[7] Ellen MacArthur Foundation, 2019
[8] Gaines and others, 2023

Theory of Deep Change

Rethink waste

Current reality

Outcomes

- Accumulation of waste
- Waste of resources
- Floods
- Pollution
- Overextraction

Structures

- Planned obsolescence
- Mass production

Goals

- Produce limitlessly
- Consume continuously

Assumptions

- Consumption is needed for progress
- “New” is better
- “More” is better
- The planet will absorb waste
- Resources are infinite
- Economic growth brings prosperity

Desired future

Outcomes

- No scarcity
- Healthy environment
- Food and water security
- Resource sustainability

Structures

- Right to repair
- Extended producer responsibility
- Sharing cooperatives
- Circular supply chains

Goals

- Make a positive impact
- Extend lifespan
- Close resource loops

Assumptions

- Resources are precious
- Resources are shared
- Resources are finite

Workers do their part to reduce waste by reusing boots as planters at the Selayur Jaya Reduce, Reuse, Reduce (TPS 3R) Waste Disposal Site. © Mushaful Imam / TUC / UNU-EHS

Rethink waste

Levers

Outer levers

Sharing economy

Methods to organize resources and assets to share them among a pool of users, intended to reduce private consumption, energy use and resource demand.

Shared with:

- Redefine value

Stewardship

The careful and responsible use of natural resources to ensure their long-term sustainability, where people and organizations see themselves as caretakers rather than consumers of resources.

Shared with:

- Realign with nature
- Reimagine the future

Standards

This includes quality standards that ensure products can have a long-life span and can be repaired but also certifications that help guide consumer choices.

Recover for reuse and recycle

Structures that allow to recover materials for reuse, repair, repurpose, refurbish, remanufacture and recycling and upcycling, reducing waste and the rate of extraction of raw materials.

Circular by design

Design that is mindful and contributes to a circular flow of materials, where the life of things is long and extended as much as possible, and when things reach their end of life they can be used as inputs for other things.

Goals

- Make a positive impact
- Extend lifespan
- Close resource loops

Inner levers

Care ethics

Attentiveness, regard and consideration for beings beyond ourselves, where the recognition of beings extends to inanimate objects and non-living parts of an ecosystem.

Shared with:

- Realign with nature
- Reconsider responsibility
- Reimagine the future
- Redefine value

Sufficiency

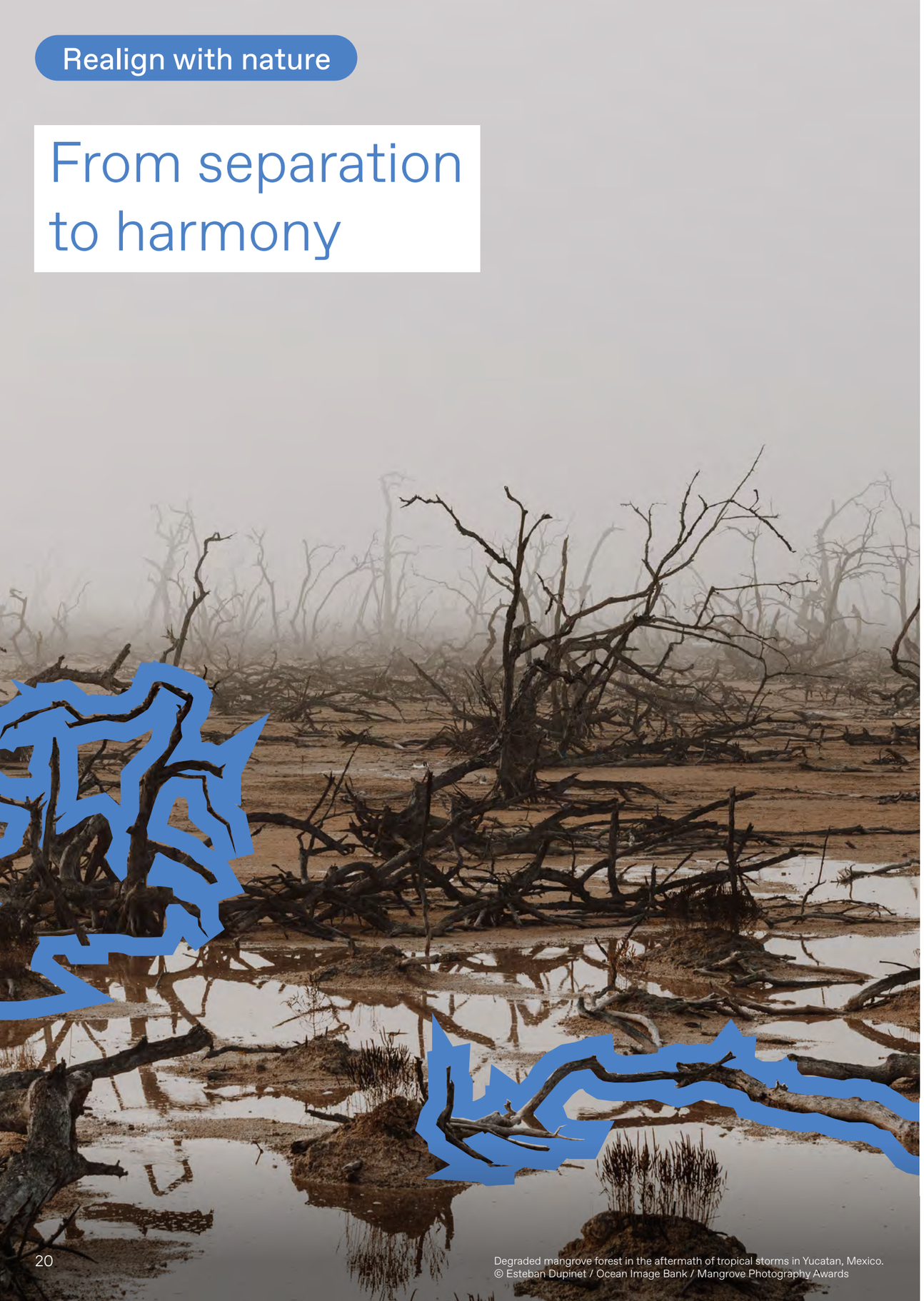
Satisfying essential needs necessary to live a good life while reducing overall demand for resources to ensure living within planetary boundaries.

Shared with:

- Reconsider responsibility
- Reimagine the future
- Redefine value

Realign with nature

From separation to harmony



Degraded mangrove forest in the aftermath of tropical storms in Yucatan, Mexico.
© Esteban Dupinet / Ocean Image Bank / Mangrove Photography Awards

Nature is in crisis. Around 95 per cent of Earth's land has been altered by human activities,[1] causing plants and animals to lose their habitat and destroying entire ecosystems. Currently, around one million plant and animal species are at risk of going extinct.[2] Populations of amphibians, birds, fish, mammals and reptiles have declined by around 70 per cent since 1970[3] and an estimated 45 per cent of all known flowering plants are threatened by extinction.[4] We know that destroying nature destroys some of the most precious resources we need for our own survival, such as clean air and water, the plants we eat or the materials to put roofs over our heads. So then, why do we keep doing it?

For centuries, we have been taught that humans are superior to, and separate from, nature. Rivers have been dammed to power our cities and industries. Entire forests and plains have been cleared to feed growing populations. These achievements are often hailed as triumphs of humanity, enabling remarkable progress and advancements. However, this mindset also prioritizes human needs over the health of the planet. We use nature for our convenience and, by doing so, compromise our planet and the lives it sustains.

One example of the way we reshape nature to suit human needs is through *channelization*, a process that alters rivers to flow in straight lines, rather than meandering naturally across the landscape. This is often done to improve navigability, create more agricultural land or to protect cities from flooding. For example, in the 1960s, the Kissimmee River in Florida, USA, was channelized – 160 kilometres of winding river were converted into a 9-metre-deep canal.[5] While this did reduce flooding, it also dried out around 160 square kilometres of wetlands, leading to a 90 per cent decline in water bird populations and a 70 per cent drop in bald eagle numbers. Many other fish, bird and mammal species vanished entirely.[6] While channelization is often done to reduce flooding in one area, it often makes flooding worse for downstream communities.

Designing nature to meet human needs is just one example of how we treat nature in a way that ends up being harmful, for both nature and humanity in the long run. Is there a better way for us to interact with nature? If so, how do we do it?

Instead of controlling natural processes, we can learn to coexist with them. For instance, a wandering river that overflows onto a floodplain might currently be seen as an inconvenience for humans, but it is an essential part of a healthy ecosystem and for sustaining our lives. Many communities around the world embrace a flood-tolerant lifestyle and even use floods to their advantage. For instance, in Viet Nam, flooding is often seen as a benefit, as it provides water and nutrients for fields, washes out salts and toxins from the soils and recharges groundwater. Fishermen call the flood season "income season" because it brings more fish; and some even refer to the flood as a friend who has returned to visit.[7]

People in many places in the world are realizing we can coexist with nature and are undoing the channelization. They are allowing the river to flow and bend freely, giving nature room to live and thrive. Even parts of the Kissimmee River have been restored. Habitat was given back to wetland species, providing corridors for panthers and bears to cross the state. The wetlands have the ability to act as a sponge, storing billions of gallons of water to help prevent flooding during storms,[6] especially important as hurricanes become more frequent and severe.

The notion that humans are separate from nature was flawed from the start. Ecosystems are complex, and humans are just one animal species in the vast web of life. We depend on the relationships between and among species and the natural processes in our environment. By reintegrating natural processes into our lives, we can acknowledge our role within ecosystems, ensuring a balanced, resilient future for the planet as a whole.

Key numbers:

25,000km
of rivers in Europe are planned to be free flowing by 2030[8]

36%
decrease in forest loss in Colombia due to conservation efforts, the lowest deforestation rate in 23 years[9]

71,000
increase in bald eagle nesting pairs in the US since 1963, thanks to prohibitions on hunting and pesticides[10]

[1] Kennedy and others, 2019
[2] IPBES, 2019
[3] WWF, 2022
[4] Antonelli and others, 2023
[5] Toth and others, 1998
[6] Main, 2023
[7] Liao and others, 2016
[8] Interreg Europe, 2023
[9] The Optimist, 2024
[10] Moore, 2024

Theory of Deep Change

Realign with nature

Current reality

Outcomes

- Habitat fragmentation
- Habitat degradation
- Species decline
- Loss of lives
- Food insecurity
- Disease susceptibility

Structures

- Fences
- Natural parks
- Channelization
- Monocultures

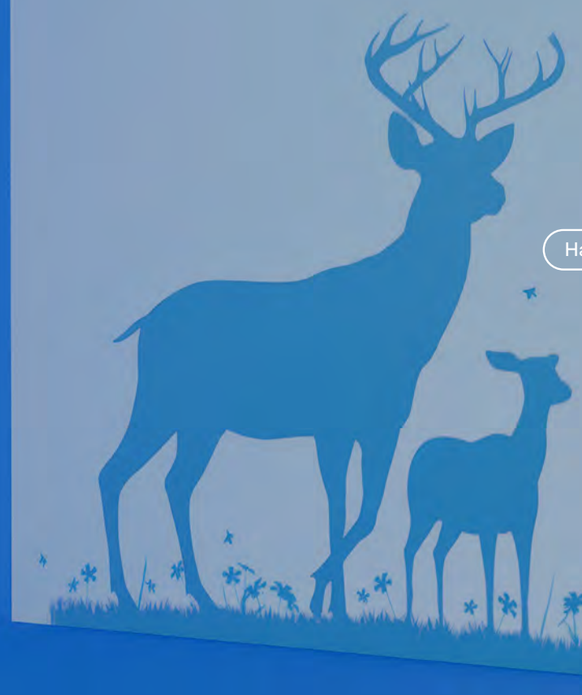
Goals

- Separate humans from nature
- Design nature to be convenient

Assumptions

- Humans are superior to nature
- Humans are separate from nature

Desired future



Outcomes

- Ecosystem resilience
- Non-human freedom of movement
- Planetary health
- Increasing biodiversity
- Food security
- Hazard protection
- Resource responsibility
- Meandering rivers

Structures

- Global agreements
- Nature valuation
- Legal personhood
- Multipurpose landscapes
- Social contract of acceptable risk

Goals

- Respect nature
- Share the same space
- Coexist with natural processes

Assumptions

- Earth is a shared home
- Humans are part of the ecosystem

A green street in the centre of Eindhoven, The Netherlands, with plants, greenery and flowers growing over houses. © Lea / Adobe Stock

Realign with nature

Levers

Outer levers

Measure what we value

Indicators that consider how humans relate and benefit from nature beyond material ways.

Shared with:

- Redefine value

Stewardship

The responsible use and conservation of natural resources ensuring respect for nature and fostering relationships of kinship.

Shared with:

- Rethink waste
- Reimagine the future

Non-human rights

Ensuring nature is considered, properly valued and accordingly respected just by itself independently of our perception of it as a commodity.

Nature education

Strategic method for repairing our relationship with nature while providing knowledge and opportunities for human reimmersion.

Rewilding

Restoration of functioning, self-sustaining and healthy biodiverse spaces without or with minimal human interference.

Goals

- Respect nature
- Share the same space
- Coexist with natural processes

Inner levers

Care ethics

The belief that life exists in relation to other life forms including plants, animals and abiotic elements.

Shared with:

- Rethink waste
- Reconsider responsibility
- Reimagine the future
- Redefine value

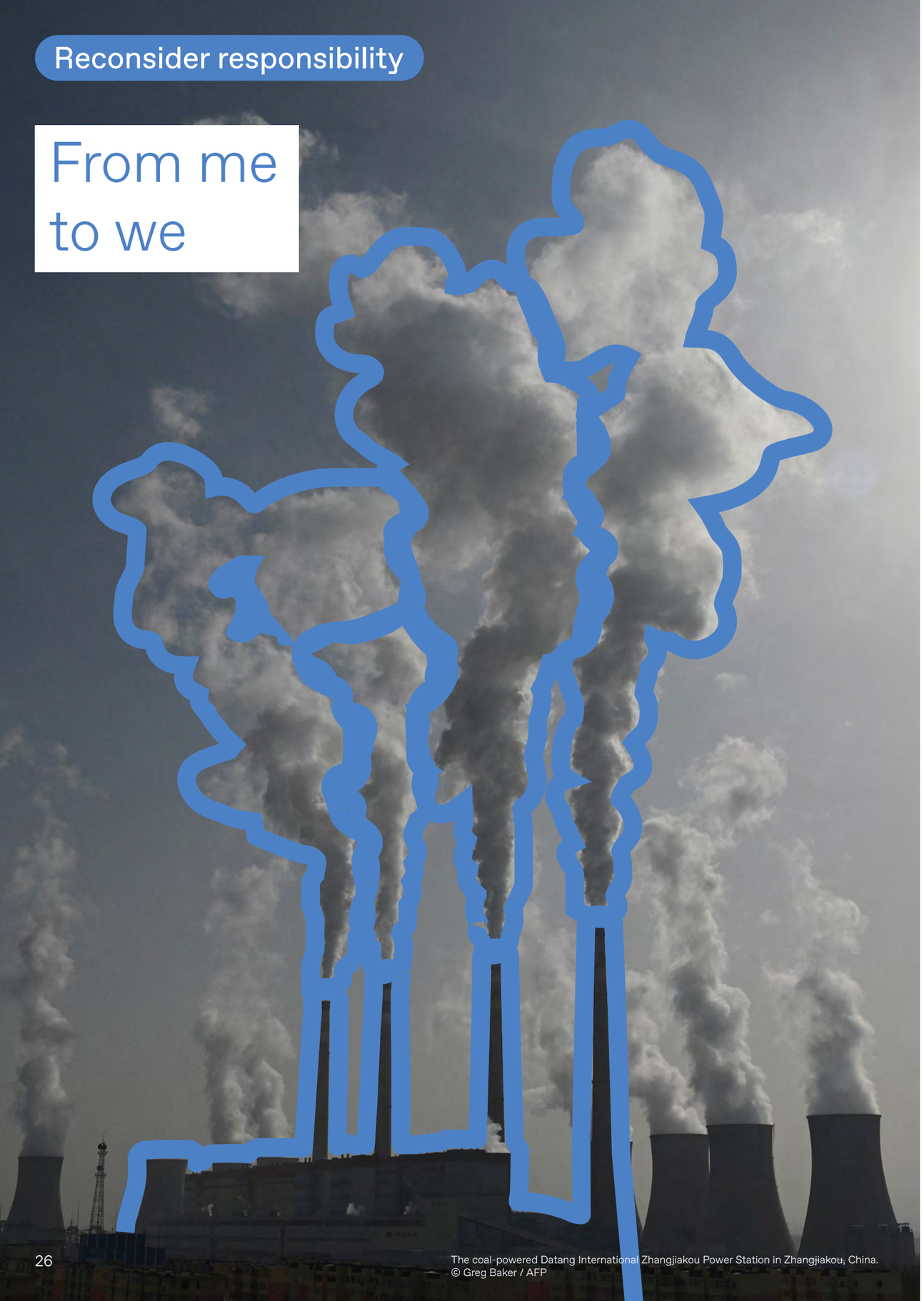
Humility

The belief that we are all part of the same kinship with other species and processes, and we depend on these relationships for survival.

Shared with:

- Reconsider responsibility
- Reimagine the future

From me to we



The coal-powered Datang International Zhangjiakou Power Station in Zhangjiakou, China.
© Greg Baker / AFP

The world is a shared home to more than 8 billion people, but resources and opportunities are unevenly distributed. Deep inequalities cut across areas such as wealth, education or access to medicine. This disparity also extends to greenhouse gas emissions and how the impacts of climate change are felt, with the hardest burdens often falling on those least responsible for them. The poorest half of the world population emits only 12 per cent of global carbon emissions but will suffer 75 per cent of expected income losses due to climate change.[1] Wealthy countries have historically been and still are the predominant emitters of greenhouse gases, and they have more means and capacity to address climate change than their poorer counterparts[2] – so why aren't they assuming responsibility?

Humans tend to think of their own community first. As a consequence, we have built many of our systems and structures on the underlying assumption that our own needs are more important than those of others. This mindset often leads us to prioritize our own benefits, while being willing to accept negative impacts elsewhere. One example is the export of plastic waste with the aim to manage plastic emissions cheaply. About 74 per cent of this exported plastic waste is sent to Asia, often to places unequipped to adequately deal with it.[3]

Carbon offsetting is another example of how negative impacts are shifted to other regions. Through offsets, countries, businesses or individuals invest in carbon-reduction projects, like forest preservation or tree planting, to balance out their own emissions. Around 93 per cent of offsets used by the top 50 companies with net-zero targets are implemented in lower-income countries, such as Indonesia, Colombia and Peru.[4] However, offsetting also often shifts the negative effects to these other countries – a practice called "carbon colonialism". In Uganda, for instance, forest offsetting projects have displaced people from their homes or traditional lands, leading to increased conflicts and violence.[5]

Solar geoengineering – an approach to cool the Earth by reflecting sunlight back to space, for example by spraying aerosols into the stratosphere – follows a similar pattern. If governments or companies unilaterally decide to pursue this approach on their own, they risk unpredictable impacts that could alter regional weather and affect food and water supply, leading to significant consequences for others.

These examples show how those responsible for the negative outcomes often shift burdens elsewhere and fail to address the underlying problems. Is there a better way for us to interact with each other across the globe?

If we see ourselves as part of a global community, we recognize that global problems require global solutions, and that pushing negative impacts to another part of the world is not a responsible solution. Relying on carbon offsetting and solar geoengineering is not only externalizing the negative impact, but it is at best a superficial fix for climate change because it avoids committing to the real solution: cutting out greenhouse gas emissions directly by phasing out fossil fuels.

For unavoidable emissions, offsetting is still a helpful approach, but it should avoid shifting harm to communities and ecosystems elsewhere, and promote collaborative, inclusive strategies – establishing stricter regulation and adequate prices for carbon credits. A promising example for local ecosystem conservation to increase carbon storage is known as the Peatland Code in the United Kingdom. Healthy peatlands are great natural carbon stores, with the UK alone storing an estimated 3.2 billion tonnes of carbon.[6] The Peatland Code encourages the restoration and management of peatlands within the UK, ensuring that carbon sequestration benefits are retained locally and equitably. By promoting projects that directly benefit local communities and ecosystems, it provides a model for avoiding the negative impacts of carbon colonialism and fosters more responsible environmental stewardship.

Key numbers:

$250 billion
per year potentially raised from a 2% wealth tax on billionaires globally[7]

98%
reduction in ozone-depleting substances since 1990, due to the Montreal Protocol, one of the most successful global agreements of all time[8]

500+
senior scientists support an International Non-Use Agreement on Solar Geoengineering globally [9]

[1] Chancel and others, 2023
[2] Hickel, 2020
[3] Liang and others, 2021
[4] Josh Gabbatiss, 2023
[5] Schmid, 2023
[6] UKCEH, 2024
[7] Hughes, 2024
[8] UNEP, 2024a
[9] Solar Geoengineering, 2024

Theory of Deep Change

Reconsider responsibility

Current reality

Outcomes

- Solar geoengineering
- Carbon colonialism
- Health inequities
- Securing access to resources
- Restrictive migration policies

Structures

- Unilateral decisions
- Externalities
- Secrecy and withheld knowledge
- Extractive industries
- Xenophobia

Goals

- Prioritize self-interest
- Protect ourselves
- Exclude others

Assumptions

- We are responsible for “our” people
- People “like us” are more important
- We cannot trust others
- We may not have enough for all

Desired future

Outcomes

- Trust among and between communities
- A safe, peaceful, just, inclusive, sustainable world
- Human rights are protected

Structures

- Non-use agreement for solar geoengineering
- Improved standards for carbon offsetting
- Standard tax for the super-rich
- Global citizenship education

Goals

- Build relations and trust
- Make inclusive decisions
- Enact solidarity
- Share benefits and burdens

Assumptions

- Earth is a shared home
- We are all equal
- We depend on each other

Indigenous children from the Terena ethnic group planting a seedling native to the Pantanal in a restoration area within their territory. © Gustavo Figueiroa / TUC / UNU-EHS

Reconsider responsibility

Levers

Outer levers

Global governance

Rules and agreements that facilitate cooperation and collective action to solve global challenges.

Education for global interconnectedness

Education enabling a better understanding of interconnectedness across the globe, nurturing respect for all, building a sense of belonging to a common humanity.

Goals

- Build relations and trust
- Make inclusive decisions
- Enact solidarity
- Share benefits and burdens

Inner levers

Care ethics

Attentiveness, regard and consideration for fellow human beings across the world.

Shared with:

- Rethink waste
- Realign with nature
- Reimagine the future
- Redefine value

Humility

Interactions across the globe are approached from an interdependent and relational perspective to rebalance power inequities and develop collaboration on equal footing.

Shared with:

- Realign with nature
- Reimagine the future

From seconds to centuries

Old and rusty barrels containing radioactive waste. © Creativemarc / Adobe Stock

Future generations living on this planet are at the mercy of the choices we make today. The people alive today determine the conditions for the trillions of people yet to be born.[1] By the time today's children reach old age, they are projected to experience four times as many extreme weather events – assuming that the world manages to keep global warming to 1.5°C.[2] Similarly, human-made chemicals and radioactive materials we have been introducing to the environment are threatening Earth's natural systems beyond safe limits.[3] Our actions are not setting future generations up for success, so why aren't we changing course?

Our societies tend to focus on the here and now when it comes to decision-making. This shortsightedness is called *presentism*. The future, on the other hand, is a more distant concept to us, which frequently leads us to disregard the potential impacts on those who come after us. When we prioritize immediate desires over the needs of the future, we frequently create problems and destroy opportunities for the next generations. Many of the decisions taken today, such as the destruction of nature and the erosion of traditional knowledge, endanger both biological and cultural diversity, creating a world with fewer resources and decreased resilience.

One example of the way presentism is creating long-term consequences is through nuclear energy, which some view as a clean and sustainable alternative to fossil fuels. Though nuclear power does indeed come with low-carbon emissions, it also produces radioactive waste that harms human health and the environment. Furthermore, nuclear waste has a lifespan of over 100,000 years, making it extremely difficult to dispose of.[4] Currently, storage is the only option: either in temporary storage sites, which pose containment risks, or long-term deep geological disposal, with only one such facility under construction globally. As a result, we continue to produce large amounts of toxic materials in the hopes that future generations will solve the problem.

Actions such as these are crippling the ability of future generations to thrive on this planet. So, how can we be better stewards for future generations?

This begins with a transition from short-term to long-term thinking, considering the lasting effects of our current actions on both the nearer and more distant future. By recognizing our place within the broader narrative of humanity, we can better understand our duty to safeguard the future and our responsibility towards next generations. This mindset is not new and is in fact deeply rooted in various Indigenous traditions. For example, the Haudenosaunee Confederacy in the north-eastern region of North America lives by the Seventh-Generation principle, which urges individuals to consider how their decisions will affect the next seven generations. Embracing this thinking could change how we view the world and the decisions we make today.

Investing in renewable energy sources like wind and solar is the clearest and most sustainable path forward. These energy sources can minimize long-term environmental damage and reduce dependence on harmful technologies. Wind power alone has helped avoid 830 million tonnes of carbon emissions per year since 2019, which amounts to roughly 2.2 per cent of the world's current annual emissions.[5,6] Future planning must not only prioritize these sustainable energy transitions but also include the interests of the future generations in decision-making, as they will face the consequences of today's choices. One approach to this is seen in Finland, where the Committee for the Future has been established to discuss future problems and opportunities. This committee ensures that today's choices are made with long-term impacts in mind. Similarly, future-oriented committees are taking hold globally in places such as Chile, Iceland and the Philippines to safeguard the well-being of those who will inherit the world we shape.[7]

The risks we face today, such as climate change and ecosystem loss, demand immediate, future-sighted responses. The time to act is now – by embracing long-term thinking, we can care for our descendants and set them up for success for generations yet to come.

Key numbers:

6.75 trillion
people will likely be born from today to 50,000 years into the future[1]

50,000+
species are preserved in seed banks worldwide to conserve plant diversity[8]

$659 billion
invested globally in renewable energy sources in 2023, reaching a record high[9]

[1] Krznaric, 2020
[2] IPCC, 2023b
[3] Richardson and others, 2023
[4] Foley, 2021
[5] Tiseo, 2024
[6] Statista, 2024
[7] Committee of the Future, 2022
[8] Walters and Pence, 2021
[9] IEA, 2023b

Theory of Deep Change

Reimagine the future

Current reality

Outcomes

- Nuclear waste
- Greenhouse gas emissions
- Knowledge and language loss
- Dark extinctions

Structures

- Path dependency
- Destroyed opportunities

Goals

- Prioritize current needs
- Prioritize convenience

Assumptions

- Future will handle it
- Our actions are insignificant

Desired future

Outcomes

- Clean energy and environment
- Sustainable and fair future
- Resilience for future risks

Structures

- Intergenerational justice
- Diverse knowledge base
- Lasting systems

Goals

- Build for the future
- Save the future
- Ensure future opportunities

Assumptions

- We have a responsibility for future generations
- We belong to a chain of generations
- Resources are finite

Reimagine the future

Levers

Outer levers

Discount rate

How we assign a present value to the costs and benefits that will happen in the future.

Youth and future representation

Considering the rights and needs of the youth and future generations in all decision-making processes.

Imaginaries

Using tools, technologies and visions of potential futures to prepare for challenges and build more resilient systems.

Stewardship

The responsibility to manage resources and make decisions that protect the interests and well-being of both current and future generations.

Shared with:

- Rethink waste
- Realign with nature

Education

To create formal and informal learnings to imagine and build for potential futures.

Goals

- Build for the future
- Save the future
- Ensure future opportunities

Inner levers

Humility

Recognition of the position of current generations in time, relation and connection to past and future others in the chain of humanity.

Shared with:

- Reconsider responsibility
- Realign with nature

Sufficiency

Ensuring that future generations have enough resources to thrive while considering what we need today.

Shared with:

- Reconsider responsibility
- Rethink waste
- Redefine value

Care ethics

The belief that life exists in relation to other life, to nurture relationships and responsibilities across generations to secure the well-being of both present and future people.

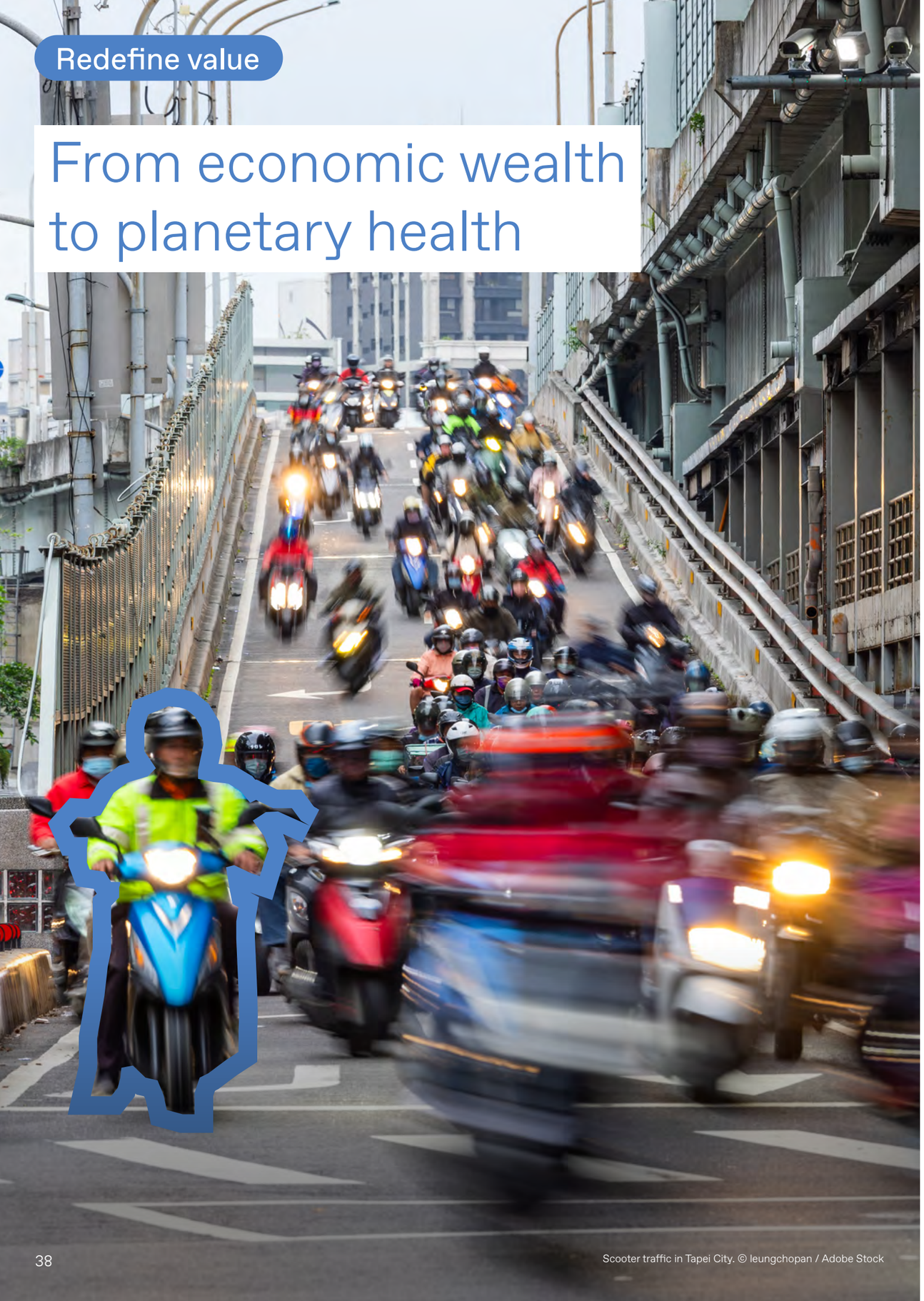
Shared with:

- Rethink waste
- Reconsider responsibility
- Realign with nature
- Redefine value

A young child sits between her mother and grandmother in a village in Thailand.

Redefine value

From economic wealth to planetary health



Scooter traffic in Tapei City. © leungchopan / Adobe Stock

Global wealth has surged, with world GDP growing from $4.5 trillion to over $100 trillion in 50 years, boosting life expectancy and comfort worldwide.[1] However, these benefits are not shared equally. The richest 10 per cent of the world population owns 76 per cent of global wealth, while the poorest half of the population holds just 2 per cent.[2] Additionally, increasing wealth above needs for a decent life does not always increase happiness. Loneliness, for instance, is a growing epidemic, affecting about 20 per cent of older adults in places like China, Europe, Latin America and the US.[3] Meanwhile, we are pushing our planet to its limits. For instance, global land degradation is increasing, impacting not just livelihoods but the ability of people to put food on the table. If more wealth does not guarantee more well-being, why prioritize economic growth?

Forests are one example of how we put economic value before other values. Forests support biodiversity, as well as human health and well-being. However, in some places, deforested land is valued up to 7.5 times more than forested land,[4] leading to strong economic pressure on forests and to deforestation. This can only happen because we tend to value our forests for their productivity while overlooking their value for providing space for biodiversity to thrive and people to enjoy.

Similarly, our own value is often tied to our productivity, too. Income is an indicator of social status, creating differences in how a person is treated by others. Work that does not create immediate financial benefits but has a high social value, such as nursing or social work, is often underpaid. The undervaluing of care work is especially pronounced when it is domestic work, such as laundry, cooking and caring for children or the elderly. This labour disproportionately falls on women and girls, who perform about 12.5 billion hours of unpaid care work daily, which would be worth over $10 trillion per year if paid at minimum wage.[5]

Is economic value really what is most important to us and to our planet? What would a more balanced approach look like?

We need to find ways to consider and balance many different values, looking beyond economic indicators. For instance, instead of measuring progress predominantly by economic output and consumption, we could assess trends in happiness or resilience to guide our decision-making. One example of this is the use of the Gross National Happiness (GNH) index in Bhutan. It tracks factors like health, psychological well-being and ecological diversity and resilience, among others, and uses those to shape policies and decision-making.[6] For instance, Bhutan was quite successful in responding to the COVID-19 pandemic with a focus on public health and social support over economic indicators in its response[7] – a strategy guided by the GNH approach.

We can also create systems that recognize non-economic values. Forests, for example, offer far more than just timber and land – they are vital to sustaining biodiversity and well-being. They absorb an estimated net 7.6 billion tonnes of CO2 annually, 1.5 times the annual emissions of the US.[8] Additionally, spending time in forests or other green spaces is associated with lower blood pressure and reduced anxiety and depression.[9] In countries like Canada, New Zealand and Japan, doctors even give out “green prescriptions” to promote health by spending time in nature.[10]

Instead of a world driven by attempts to continuously grow the economy, we can create one that prioritizes a diverse set of values such as people’s happiness and environmental health where we focus more on compassion and care, aiming for equal opportunities for all, so everyone has the chance to lead a life of dignity and fulfillment, in harmony with a healthy planet. To do this, we will need to use resources sustainably and live within our environmental and planetary means. As such, we can redefine what “value” means for us, so in the end, we can better prioritize those things that truly secure the well-being of the planet as a whole.

Key numbers:

8%
increase in average self-reported happiness across 30 countries from 2020 to 2024[11]

20+
countries with “right to disconnect” rules, preventing work from overlapping with personal time[12]

50+
methods and approaches exist to make the diverse values of nature visible[13]

[1] OECD, 2024b
[2] Chancel and others, 2022
[3] WHO, 2021
[4] Runyan and D’Odorico, 2016
[5] Oxfam International, 2022
[6] OECD, 2024a
[7] Dorji, 2020
[8] Harris and Gibbs, 2021
[9] Bauer and White, 2023
[10] Broom, 2022
[11] Ipsos, 2024
[12] Da Silva, 2024
[13] IPBES, 2022

Theory of Deep Change

Redefine value

Current reality

Outcomes

- Overextraction
- Time poverty
- Inequality
- Exceeding planetary boundaries
- Poor health

Structures

- Economic distribution system
- Market-based decision-making
- Gross Domestic Product
- Shareholder primacy

Goals

- Reward productivity
- Maximize economic growth

Assumptions

- Productivity brings success
- Economic growth brings prosperity

Desired future

Outcomes

- No hunger
- No poverty
- Equity and equality
- Happy, healthy people
- Happy, healthy planet

Structures

- Well-being valuation
- Public service
- Universal Basic Income
- Sharing cooperative
- Income/wealth tax
- Wealth line

Goals

- Recognize non-economic values
- Meet the needs of all
- Live within limits
- Increase well-being

Assumptions

- We depend on each other
- Everyone deserves happiness
- Resources are finite
- The most valuable things in life are priceless

Community members plant a vibrant vegetable garden in the heart of Avenida Paulista in São Paulo, Brazil. © Paula Rainho Lopes / TUC / UNU-EHS

Redefine value

Levers

Outer levers

Measure what we value

Indicators to measure intrinsic values, such as happiness and resilience.

Shared with:

Realign with nature

Service to the community

Engagement and contribution to the local, national or world community, recognized and valued by society.

Equitable resource distribution

Methods to ensure everyone has access to the resources they need, such as income tax.

Social safety nets

Methods to ensure everyone meets a minimum acceptable level of well-being, such as social security or unemployment benefits.

Sharing economy

Methods to organize resources and assets to share them among a pool of users, intended to reduce private consumption, energy use, resource demand.

Shared with:

Rethink waste

Define a good life

Determining what is needed for humans to be happy, healthy and comfortable within what is possible for the planet to provide.

Goals

Recognize non-economic values

Meet the needs of all

Live within limits

Grow well-being

Inner levers

Sense of belonging

A feeling of deep connection to others, and of being a part of the wider society.

Life purpose

A guiding motivation that gives your life a sense of direction.

Care ethics

The belief that life exists in relation to other life, and other beings deserve consideration.

Shared with:

Rethink waste

Reconsider responsibility

Reimagine the future

Realign with nature

Sufficiency

The belief in satisfying essential needs, prioritizing quality of life, but not needlessly striving to satisfy infinite human material wants.

Shared with:

Reconsider responsibility

Reimagine the future

Rethink waste

Chapter 3

Research design

"The difficulty lies not so much in developing new ideas as in escaping from old ones."

— John Maynard Keynes

Section 3.1 Background

The previous chapter introduces some of the necessary changes we can make as a global community to ensure a more just and sustainable future, and highlights the negative outcomes and risks we face if these changes are not made. The question posed in the introduction stands: if we recognize that these outcomes are undesirable, why don't we change course?

To answer this, we must first understand that the challenges and adverse impacts that we regularly observe or experience, like losses during floods or wealth inequality, occur in the context of deeper-seated structures, processes, behaviours and values embedded in our societies. These structures and processes are socially constructed, meaning that our understanding of the world and what we know to be true or false, right or wrong, is shaped by the beliefs and values of the society we live in, built over time and continuously renegotiated through social interactions and agreements among individuals in a society (Berger and Luckmann, 1966).

For instance, the concept of a plant being a "weed" is socially constructed, as certain plants can be considered bothersome or beneficial by different groups at different times (Argüelles and March, 2022). Stinging nettle *(Urtica dioica L.)*, for example, known for its spiny leaves that cause irritation, is capable of outcompeting smaller or less vigorous plants due to their fast growth and high densities (Di Virgilio and others, 2015). It is considered a weed in intensive agriculture and many gardens, but in other places it is cultivated as a crop, prized for its nutritional values and medicinal capabilities (Bhusal and others, 2022). The concept of "weeds" is built on an assumption of human exceptionalism, that humans are superior to the rest of nature and can pick and choose which species can live or die based on their utility or hinderance to human needs (Holland, 2023). This assumption has often led to the goal to produce as much as possible of a single species that is seen as useful, and remove all others seen as "weeds". In this way, the landscape's biodiversity decreases and nature's contributions become unidimensional towards human needs. Occasionally, pursuing the socially-constructed concept also creates cascading unintended, unwanted outcomes. To get rid of perceived weeds, herbicides are often sprayed, which cause damage to the environment: decreasing pollinator numbers and polluting soils; and impact human health, through endocrine disruption or increasing cancer risk (Gasnier and others, 2009; Mohd Ghazi and others, 2023; Ward and others, 2023).

If we frequently notice that certain actions or behaviours lead to undesirable outcomes, why isn't more change made? For instance, as we may become aware of the harmful health and environmental impacts of weed killers, some people may choose to use them less frequently or switch to more "eco-friendly" alternatives. However, we rarely question the deeper, socially-constructed ideas that drive the behaviours and outcomes in the first place – in this case, the idea that humans are superior to nature and the very concept of "weeds". To create true systemic change and avoid unwanted outcomes, we must challenge and rethink the underlying assumptions and beliefs that created them.

Nochtem opencast mine with the cooling towers of the Boxberg lignite coal-fire power station in the background in eastern Germany. © Barbara Laborde / AFP

Section 3.2 Building the theory

In order to change future undesirable outcomes, our socially-constructed systems need to change. In this report, we developed a framework to guide the thought process of transformative change by combining several existing concepts into a new, more comprehensive model.

At the core of the argument is the iceberg model of systems thinking (Kim, 1999). This model, as shown in ***Figure 1***, suggests that the events and outcomes observed in the world are just the "tip of the iceberg", while the deeper causes lie beneath, influencing worldly outcomes. Below the surface, one can see that events are part of larger patterns and trends, which are shaped by underlying social structures, such as institutions, laws and behaviours, all of which are influenced by societal beliefs, assumptions and values. Together, these layers characterize a "system". In other words, they are a set of interconnected influences that produce their own patterns of behaviour as a result of their connections. If the current events observed in the world are undesirable, such as devastation after a wildfire or a desert locust outbreak, they can often be tied back to global climate change, and solutions can target the root causes of the problem. The root causes are found at the bottom of the iceberg in the assumptions, values and beliefs of the system. An example of this in our current system is the tendency to prioritize profits or global demand pressures on resources (UNU-EHS, 2021; UNU-EHS, 2022).

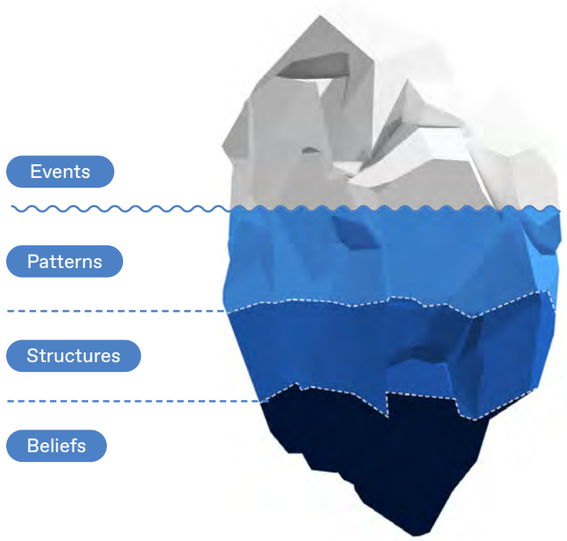


Figure 1: Iceberg model of systems thinking, adapted from Kim, 1999 and UNU-EHS, 2021

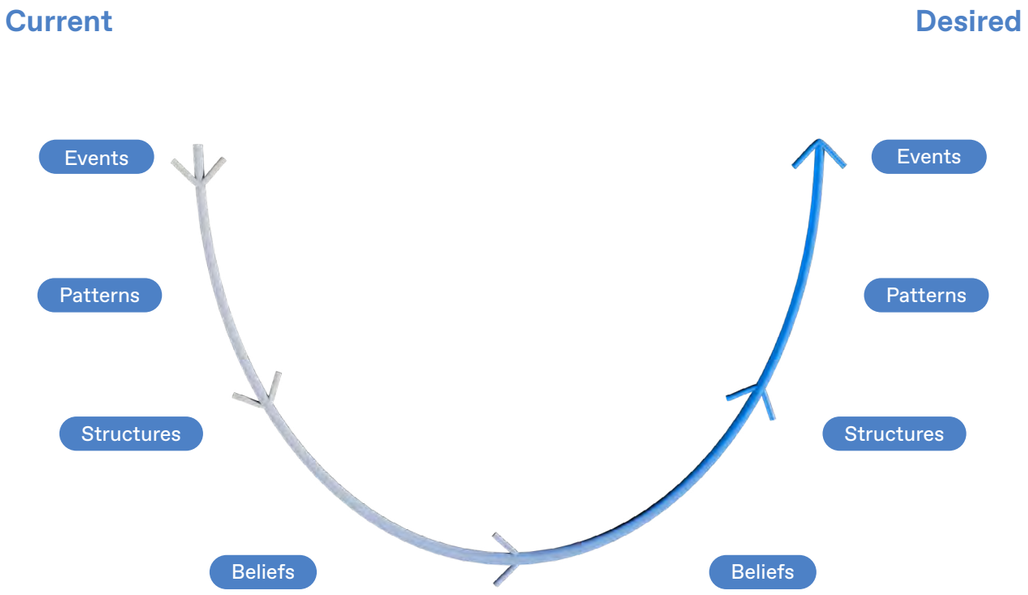


Figure 2: Combining the iceberg model with Theory U, adapted from Scharmer, 2016

We combined the ideas from the iceberg model with inspiration from Theory U, a framework designed to help individuals, organizations and communities break free from established behaviour patterns to foster collective mindset shifts (Scharmer, 2016). This framework facilitates a reflective process, guiding individuals and groups to develop an awareness of the "inner place" – our internal beliefs, assumptions and thoughts – from which their actions are sourced. This encourages a more thoughtful analysis of the outcomes produced by the current system, and examination of how the system operates and the underlying rules, values and assumptions shaping it. The theory also provides a model for envisioning a possible, brighter future and supports people in identifying different means of change by altering that inner place (Robele, 2024). People undertaking the reflection process are encouraged to imagine the futures they would rather have and to discuss how a new system could function, what new structures and rules would be necessary and what outcomes it could possibly generate. Ultimately, it guides the process of letting go of harmful thought patterns while encouraging a forward-looking vision for more desirable outcomes (Glasl, 1997; Scharmer, 2016). Combining the iceberg model with Theory U, shown in ***Figure 2***, allows us to look at the systems currently in place and the root causes of some of the systemic issues they allow while reflecting on what a future system could look like instead.

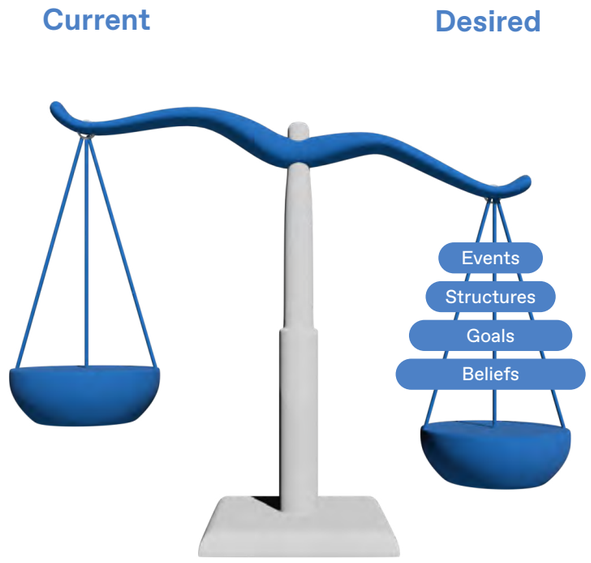


Figure 3: Action Scales Model, adapted from Nobles and others, 2022

We also took inspiration from the concept of leverage points and levers as a means to facilitate change at different points of any system. Leverage points are described as places to intervene and change how a system functions (Meadows, 2008). Among the multitude of theories and categorizations of leverage points, Meadows' 12 leverage points are most widely used. The leverage points are listed in order of how meaningfully they are able to change a system, ranging from relatively light change in system parameters to deep system paradigm shifts (Meadows, 2008; Abson and others, 2017; Birney, 2021). However, we found that the Action Scales Model (ASM), which builds on Meadows' work, was the most intuitive and meaningful to integrate with the iceberg model and Theory U. The ASM, shown in ***Figure 3***, was created to help practitioners and policymakers understand systems thinking and identify opportunities for change (Nobles and others, 2022). This model combines Meadows' 12 leverage points with the iceberg model and splits the system into four levels where leverage points are found: *events, structures, goals* and *beliefs*. The four levels are depicted as weights on a scale, from lightest (events) to heaviest (beliefs); the heavier the weight, the greater the change to the system (Nobles and others, 2022). Applying the model to risks and risk reduction, for instance, could mean that fighting forest fires with water carried by aircrafts may act at the event level, where it can help to put out the fire and may prevent the worst outcomes. However, activity at the event level does not carry as much weight as shifting the goals of the system. Changing the goals of the system, such as prioritizing sustainable and renewable energy to limit climate change, has much more potential to prevent a hotter and dryer planet where wildfires are spiralling out of control (UNU-EHS, 2022). The model also emphasizes the interconnectivity between levels. The events, structures, goals and beliefs reinforce each other, so interventions should occur across multiple levels to maximize the likelihood of systems change (Nobles and others, 2022).

Section 3.3 Theory of Deep Change

We created the Theory of Deep Change (ToDC) by combining these concepts into a more comprehensive framework for making deep, systemic changes. One of the advantages of the ToDC is that it allows for two different entry points for the analysis. It can either start by understanding how the current negative outcomes are produced and how a deep change can lead to more positive outcomes, or start with positive visions of the futures and exploring the deeper changes needed to be able to arrive there.

Starting with the negative outcomes, the ToDC starts with the iceberg model with understanding our current reality by analysing existing outcomes and their underlying structures. Then, following Theory U, the ToDC guides a reflection of the assumptions that support the current system, while envisioning a more desirable future and how these assumptions can be altered to achieve it. Finally, based on the ASM, the theory encourages determining changes at multiple levels that can be made to fundamentally transform the current system into the desired one, recognizing that the deeper change is often more effective. Similar to the ASM, we also separated the systems into four levels: ***outcomes***, ***structures***, ***goals*** and ***assumptions.***

The ToDC depicts the systems of study as a tree, shown in ***Figure 4***. The **outcomes** are the fruit of the tree, borne by the trunk as the **structure** of the system that provides all the physical support necessary to maintain the tree. The **goals** are the roots of the tree, which feed the structural trunk and give the system life. The **assumptions** are like the nutrients in the soil that are taken up by the roots and ultimately determine how healthy the tree, in this case, the system, can be. In keeping with our metaphor, rotten roots will produce rotten fruits. The tree metaphor gives more agency to our ability to change the system than is represented in the other frameworks, as cultivating the soil and tending to the roots is essential to grow a new and different system. It also provides meaningful entry points for change, which we have named **inner** and **outer levers**, as a more simplified way of understanding leverage points.

Figure 4: Theory of Deep Change

As shown in the previous section, our socially constructed reality is based on the core **assumptions** and philosophies that guide our behaviour. These are shared, collective ideas from everyone in a society and the deepest beliefs about how the world works (Meadows, 2008). One assumption, for instance, is that humans are superior to other species on the planet. In this case, this assumption has been transmitted through different societies by academic and religious teachings, but they can also be conveyed in many different ways; for instance, through laws and regulations, institutions, language or books and movies. Throughout our lives, we absorb these beliefs, values, thoughts and emotions, and unconsciously perpetuate this constructed reality for others. It is important to recognize that these assumptions are not necessarily universal. For instance, not all cultures and societies assume that humans are superior to other beings on the planet. These foundational assumptions shape the **goals** of any given system and those who participate in it (Riddell, 2013). For example, with an assumption that humans are superior to other species, a likely goal of the system would be to design nature to be convenient for humans. We are often not consciously aware of these goals, but they are incredibly important. They form the *purpose* of our everyday actions, opinions, needs, desires, innovations and behaviours and determine what actions and behaviours will be rewarded or approved by society.

The assumptions and goals form the **structures** that help realize those goals. These structures can be physical things, such as infrastructure; organizations, such as governments or companies; or written and unwritten rules, such as laws or cultural norms. These are the mechanisms that make our societies work, informed by the goals of the system. In our example goal of designing nature to be more convenient for humans, these structures could be things like fences, monocultures, river channelization, domestication of animals and plants, pesticides and herbicides, land tenure, motorways and many, many more.

These structures produce the **outcomes** that we regularly observe and experience in our daily lives. These outcomes are the visible events, behaviours and actions that we exhibit outwardly, but are symptoms of the way the system functions; produced and expressed within the boundaries that the system allows. As mentioned in **Chapter 3.1**, occasionally, the system (built from assumptions, goals and structures) produces outcomes that are somehow undesirable. In the case of human superiority over nature, this system can be linked to several negative consequences. For instance, monoculture plantations designed to maximize food production for humans results in nutrient-deficient habitats for pollinators (Vu and others, 2024) and increases plants' susceptibility to diseases (Balogh, 2021). River channelization to ease navigation for ships and increase available arable land can destroy wetland habitats (Main, 2023) and worsen the impacts of flooding downstream (Hohensinner and others, 2018).

Sometimes, we are unconscious of the assumptions that underpin the **outcomes** we observe, so we can start with the outcomes and use the ToDC to trace them back to their roots. For instance, we can recognize an outcome of increasing waste in the world and find that it is enabled by certain **structures**, such as *planned obsolescence*, or deliberately limiting the usable life of a product. We can then explore the underlying **goals** and assumptions of the system that created those structures, such as the goal to produce and consume as much as we can, based on the **assumption** that consumerism and endless economic growth creates prosperity.

Often, our understanding of risks and risk reduction focuses at the outcome level. For instance, you may see on the news that your city experienced intense flooding, and you may read in the paper that your local river is polluted with plastic. These stories may try to explain why they occur, mentioning climate change, single-use plastics or littering laws. Yet, we very rarely engage with the roots of the tree, not often challenging or questioning the beliefs, values and assumptions that produced those outcomes in the first place.

Recognizing this, we can critically reflect on the present state of environmental change: our current paradigm creates outcomes that hardly anyone desires, but by imagining a future with better outcomes, we can create radical change. For instance, if the increase of waste in the world is recognized as undesirable, then we could rather **rethink waste** and imagine a world without it: a world where things are designed to last, to be repaired and to be put back in the system and used again. As depicted in the ToDC framework, if we see that our current underlying goals and assumptions are producing negative outcomes that increase risk, to create fundamentally different outcomes and achieve a future vision, we need to start change at the roots. If the outcome of increasing waste in the world is undesirable, and we find that the assumption of consumerism is supporting it, then we can change the system at the roots to bear the fruits of reduced waste. In other words, we can abandon the old goals in favour of new ones, adopt new assumptions on which to base them and build new structures to support them. For instance, to create a world without waste, instead of an assumption that increasing consumption is necessary for prosperity, we can cultivate an **assumption** that resources are finite, with a goal to make items useful for as long as possible, and create a **structure** that encourages items to be mended and repaired. This will help us produce the **outcomes** for a more desirable future – in this case, a world without waste.

The good news is that since the rules and functioning of our communities are socially constructed, they are entirely changeable – nothing is set in stone. Truly lasting, transformative change, comes from changing the underlying goals of the system (Goldberg and others, 2020; Bristow and others, 2024) by adopting new assumptions – better roots – and building new structures to produce more desirable outcomes – better fruits. Though leverage points, or places to intervene in the system, can be found at any level, the **levers**, or ways to act on these leverage points, are most relevant when they interact directly with the goals of the system, which happens at the **assumption** and the structure level. In order to bring about the new assumptions and **structures** necessary to create a future vision, we conceptualized two entry points for change: **inner** and **outer levers**. The ways to change the current assumptions are defined as **inner levers**, which are paradigm or mindset shifts that allow people to redefine the boundaries of what is possible. For instance, if one of the goals of **rethinking waste** is to make items useful for as long as possible, then one of the inner levers could be to adopt a sufficiency mindset, to help cultivate an assumption that resources are finite and we can rather use what we have for as long as we can (Bocken and others, 2022). Adopting new assumptions is one of the deepest places we can leverage change (Meadows, 2008). Additionally, since the structures of the system are formed by these goals and assumptions and provide the foundation for resulting outcomes, another powerful area of change is to build structures informed by these new goals. We define these shifts in structures as outer levers of change, reflecting the goals of the system in the tangible world. For the goal of extending the usable life of materials, one of the outer levers could be a circular design process, where products are designed with the explicit intent to be repaired or reused. This could enable structures such as modular design, where products are made of various independent pieces that can be interchanged and replaced without disrupting the overall function.

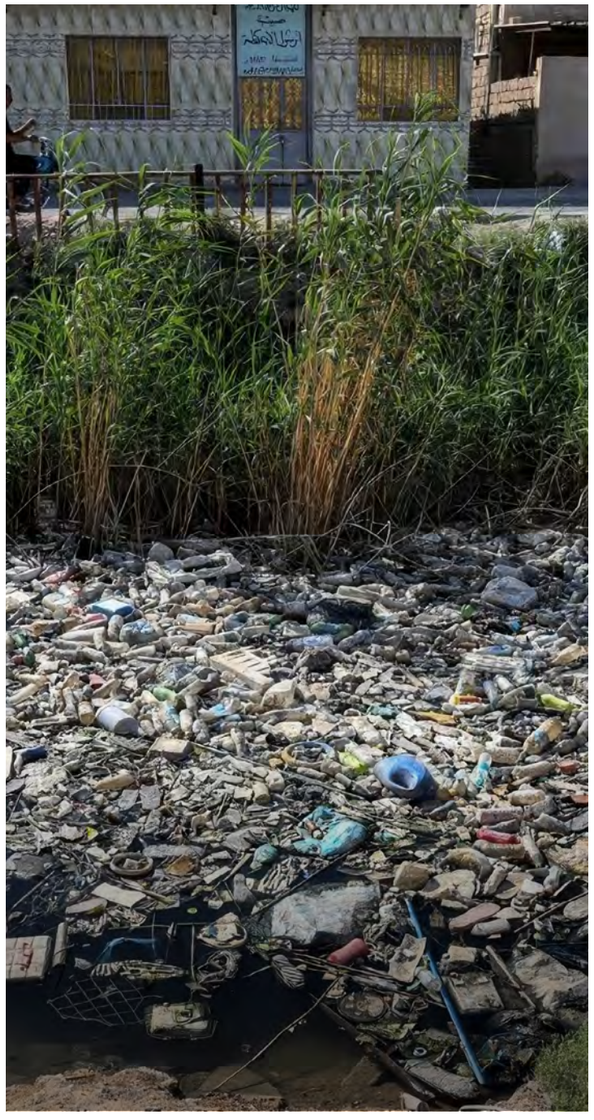
The **inner levers** represent mindset shifts that must be taken up on an individual level, requiring that we recognize our own risk-producing assumptions and biases, and model new assumptions and goals where we can. We acknowledge that whole system change is too big for one individual to accomplish, but our systems are made up of many individuals – and they are socially constructed and maintained by our collective values and behaviours. The **outer levers** involve structural, policy and institutional reforms that enable the collective shift from individual change to a broader, societal transformation. They focus on tangible actions that align with the new mindsets cultivated by the inner levers, requiring collective action to accomplish them effectively. Ultimately, sustainable change emerges from the interplay between these levels, reinforcing the idea that both individual transformation and systemic reform are inseparable components for lasting progress.

Limitations

The ToDC, just like any model, does have its limitations. To start, it is a simplified view of how outcomes are created. In reality, there is never a handful of clear-cut reasons that can be neatly organized into categories. The theory is intentionally simplified to provide a framework of thought to explain the complexity of our world, where assumptions, actions and outcomes are highly varied and interconnected. It helps to guide us beyond just systems thinking into envisioning what a desired system could look like, and to identify what is working against us in the effort to create it. The framework also does not provide explicit guidance on how these changes can be enacted; instead, it provides the levels at which it is advantageous to do so. This is a limitation, but it is also purposeful. In reality, change is very context specific, and it will look very different for different people. Strategies that work in some cases may have the opposite effect in others, so collaboration and dialogue among changemakers is vital.

Additionally, the framework provides limited guidance on how to approach changes at multiple levels from individual to system level. Of course, change should extend beyond the individual level as the pressure points for deep change can be found in multiple places, and should involve also groups, organizations and eventually, whole systems. The ToDC provides different entry points for change in the **inner** and **outer levers**, as **inner levers** are meant for mindset and value shifts, while the **outer levers** are for collective structural change. The inner changes provide only an opportunity for individuals to be part of systemic change rather than a responsibility to do so – as system change is larger than one individual can accomplish.

Additionally, the framework does not provide guidance for the consideration of interactions across levers at different levels and their influence on each other (Abson and others, 2017) or the integration of negative side effects that may occur as a result of the levers we pull to create our desired future. For example, restoring wetlands can create habitat for mosquitoes, which could increase the incidence of malaria or yellow fever (Dale and Knight, 2008). Therefore, though these levers contribute to more desirable outcomes, they are by no means only positive, and trade-offs need to be acknowledged.



Plastic waste fills a tributary irrigation canal off the Shatt al-Arab River in Basra, Iraq. © Hussein Faleh / AFP

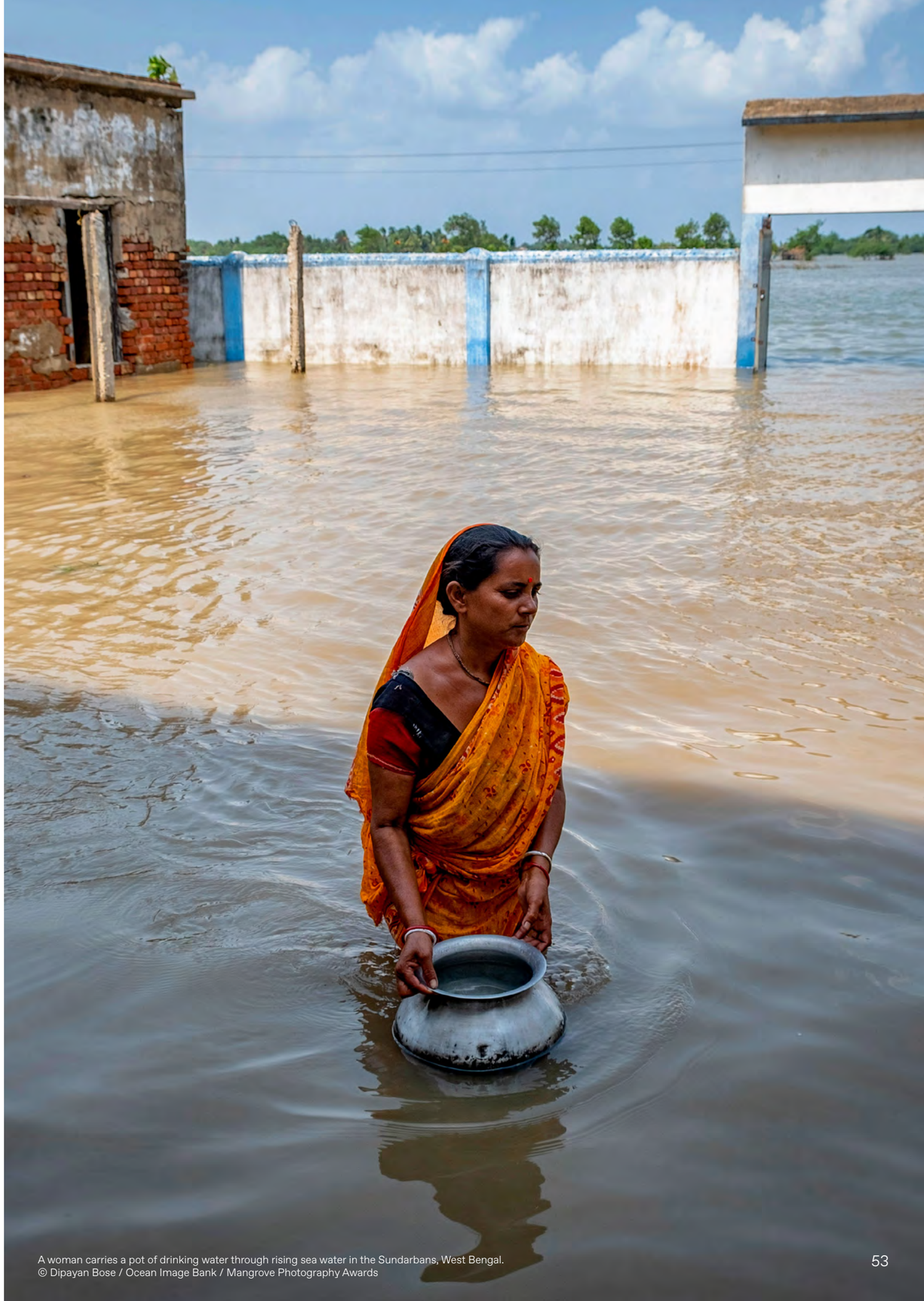
Section 3.4 Applying the theory

Many analyses, including past *Interconnected Disaster Risks* reports, have focused on the current-reality side of the model, explaining how the negative outcomes of past disasters, such as the impacts of the Haiti earthquake (Eberle, 2022), and existing patterns like groundwater depletion (Mena Benavides and others, 2023), are perpetuated by the underlying structures, goals and assumptions of the system. In past editions we have analysed the root causes and underlying assumptions for many different global problems. Building on this knowledge, this year's *Interconnected Disaster Risks* report brings attention to the desired future outcomes and the related new assumptions, goals and structures. Therefore, we started our analysis on the future visions side of the ToDC with desired outcomes we would like to experience in the world: *creating a world without waste, being one with nature, cultivating a global neighbourhood, being a good ancestor and designing an economy of well-being*. These were identified in the previous report edition as ways to help reduce disaster risk and to prevent reaching catastrophic risk tipping points (UNU-EHS, 2023). The first part of our analysis was determining specific desired outcomes within these topics and then analysing structures, goals and assumptions that could help produce these outcomes for this future vision. For instance, if we want the **outcome** of having an economy of well-being and having happy, healthy people, this could involve a **structure** of having universal basic income, based on a **goal** to meet the needs of all, within the boundaries of what the planet can provide, built on an **assumption** that everyone deserves to be happy and healthy.

We then worked our way from the desired assumptions to the other side of the ToDC. We analysed the current underlying assumptions, goals and structures that prevent us from meeting those desirable outcomes. We also highlighted a few examples of the negative outcomes that result from the current assumptions and goals that produce or multiply risk. For example, the belief that economic growth is necessary for progress is an **assumption** that often prevents us from having an economy of well-being because it can result in the **goal** to maximize economic growth and **structures** that measure solely economic value. This often leads to an **outcome** of overextraction of resources for purely economic gain.

Each of the five topics were translated into changes we can make to move from the current system to the desired one, categorized as the need to **rethink waste, realign with nature, reconsider responsibility, reimagine the future** and **redefine value.** We then researched potential levers to enact these changes at different levels. As mentioned in the previous section, these are classified as **inner levers**, which have the power to change the underlying assumptions, and **outer levers**, which can change the structures. Each of the five topics has a combination of inner and outer levers that individuals and collectives can pull that would help to move the system in the direction of the desired reality. For instance, for the goal of meeting the needs of all, we could pull the **inner lever** to adopt an ethic of care to cultivate the assumption that everyone on the planet deserves to be happy and healthy. An **outer lever** could be to implement social safety nets, such as a universal basic income, that would ensure that everyone's fundamental needs are met *(See* **Chapter 6** *for more details)*.

Importantly, the application of the ToDC in this report is informed by our understandings of certain issues as authors of this report. They are thus influenced by our scientific background and positionality related to our own cultural, social and political context and worldviews. There are many other themes within the five changes we suggest that we were unable to include due to the scope of the report. We chose the examples based on our research and understanding to exemplify how the ToDC can work, although a different group of people applying the ToDC may come to different conclusions.



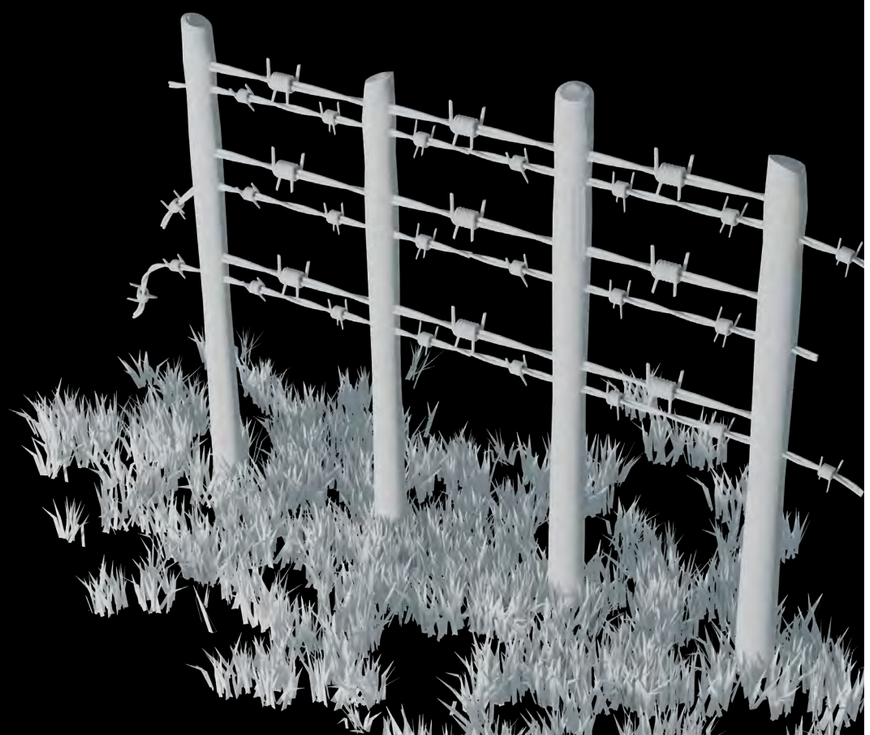
A woman carries a pot of drinking water through rising sea water in the Sundarbans, West Bengal.
© Dipayan Bose / Ocean Image Bank / Mangrove Photography Awards

Chapter 4

Current realities

"We do not like to hear that we are vulnerable, that we are the dinosaurs and the meteorite at the same time."

— Eckart von Hirschhausen,
translated from German



The ToDC helps to understand that many of the undesirable outcomes we frequently observe are rooted in the deeper structures, goals and **assumptions** embedded within our societies. When applying the theory to our cases, we identified several common themes in the assumptions that are currently driving risks and undesirable outcomes: exceptionalism and consumerism. The assumptions described below are by no means comprehensive, but were the most common themes among our five topics. The current reality includes assumptions such as the belief that "new" is better, which limits efforts to **rethink waste**, or the idea that constant economic growth is needed for progress, which can keep us from **redefining value**. These themes highlight the need for a fundamental shift in these underlying goals and assumptions in order to bring about lasting change towards a more desirable system.

Section 4.1 Exceptionalism

One of the recurring themes for several of the studied topics is the idea of exceptionalism, or the belief that a particular entity, such as a species, nation, individual or time period, is distinct from and more important than others. Human exceptionalism is holding us back in our efforts to **realign with nature**. Human exceptionalism is the belief that humans are unique compared to other species on Earth, often justified by the idea that only humans possess certain traits, like culture or abstract reasoning, allowing us to transcend ecological or biological limits (Catton and Dunlap, 1978). This belief fosters the notion that humans and societies are independent of the ecosystems we live in and what happens to nature has little impact on us (Kim and others, 2023). As a result, it drives us to justify exploiting nature or confining it to distant spaces. Views of human exceptionalism have been shown to impact decision-making. For instance, one study showed that exceptionalist beliefs were negatively associated with the willingness to invest time or money in environmental restoration (Coley and others, 2021). Human goals rooted in exceptionalism have driven river channelization over centuries, with detrimental outcomes for nature. For example, in the 1960s, the Kissimmee River in Florida, United States, was channelized to reduce flooding to human settlements. However, it also dried out around 160 square kilometres of wetlands, leading to a 90 per cent decline in water bird populations and a 70 per cent drop in bald eagle numbers. Many other fish, bird and mammal species vanished entirely (Main, 2023).

A similar mindset prevents us from **reconsidering our responsibilities** towards other people and societies around the world. This belief in national or cultural exceptionalism suggests that some people or societies are inherently different from and better than others, fostering a sense of moral, cultural or evolutionary superiority (Nymalm and Plagemann, 2019). This notion has historically been used to justify racism and colonization, viewing other societies as inferior and imposing control under the pretext of "civilizing the uncivilized" (Kämmerer, 2018). This logic is also used to take control of land for the "common good", based on the idea that local populations are incapable of using the land or conserving resources "effectively" without interventions from outside (Domínguez and Luoma, 2020). The protection and preservation of the environment in some countries is often done for the benefit of other countries; such as for tourism, game hunting or carbon offsetting credits (Domínguez and Luoma, 2020).

This theme of exceptionalism also holds back attempts to **reimagine the future**, where present-day issues are consistently prioritized over those affecting future generations. The reasoning stems from the belief that only the present exists currently, and because future generations do not exist yet, there is little responsibility owed towards them (Earl, 2011). This temporal exceptionalism positions the current living population as unique or superior to any future population, making our present needs more urgent than the future's well-being. A clear example is the endorsement of nuclear energy to meet our present-day need for low-carbon energy generation (IAEA, 2021). However, we currently do not have safe and long-term radioactive waste sites, which will need to maintain nuclear waste that can last for thousands or millions of years (Besnard and others, 2019) – far beyond the planning horizon of anyone living today. Although we know it could have disastrous consequences for future generations, avoiding those impacts would likely require us to significantly alter our lifestyles, such as using less energy overall, and to sacrifice many conveniences that we currently enjoy.

Section 4.2 Consumerism

Another recurring theme in our analysis was *consumerism* – the belief that acquiring and consuming more material goods is essential for happiness and well-being (Hayes, 2024). This idea directly undermines attempts to **redefine value**, as it is closely tied to the philosophy of neoliberalism, which holds that human well-being is best achieved through the market (Becker and others, 2021), allowing it to determine what is valuable for society. Neoliberalism reduces individuals to consumers, suggesting that the main way people can express their choices, opinions or values is through buying, selling and consuming goods and services (Monbiot, 2016). This mindset reduces human activity to economic calculations (Metcalf, 2017) and since the market determines what is valuable, anything that does not generate financial profit is seen as unimportant. Additionally, neoliberalism depends on continuous growth, which in turn drives the need for constant consumption. This, combined with the commodification of nature, sets the stage for overextraction and depletion of natural resources to the detriment of the overall ecosystem (Chichilnisky, 1996).

Consumerism also similarly keeps us away from **rethinking waste**, as it promotes a culture of constant consumption and subsequent need for disposal. On the production side, meeting consumer demands requires large inputs of energy and materials and therefore generates significant volumes of waste products (Orecchia and Zoppoli, 2007). This process not only increases the extraction of natural resources, but it also accelerates the disposal of existing products, which are quickly deemed outdated or undesirable. The producer-consumer system must continually create new wants, desires and reasons why our happiness and well-being depend on purchasing something new. As consumers seek the latest versions of goods, older products frequently end up as waste. This is what drives the linear "take-make-waste" production model, where resources are continuously extracted, used briefly and then discarded, worsening the global waste crisis.

A man watches on a smartphone as he pauses to repair tools in Jakarta.
© Yasuyoshi Chiba / AFP

These are just a few examples of the assumptions that produce risks and negative outcomes for our current reality. However, as discussed in **Chapter 3.1**, these assumptions are entirely socially constructed – so this reality is created and reinforced by the structures and boundaries we create. But it does not have to be this way.

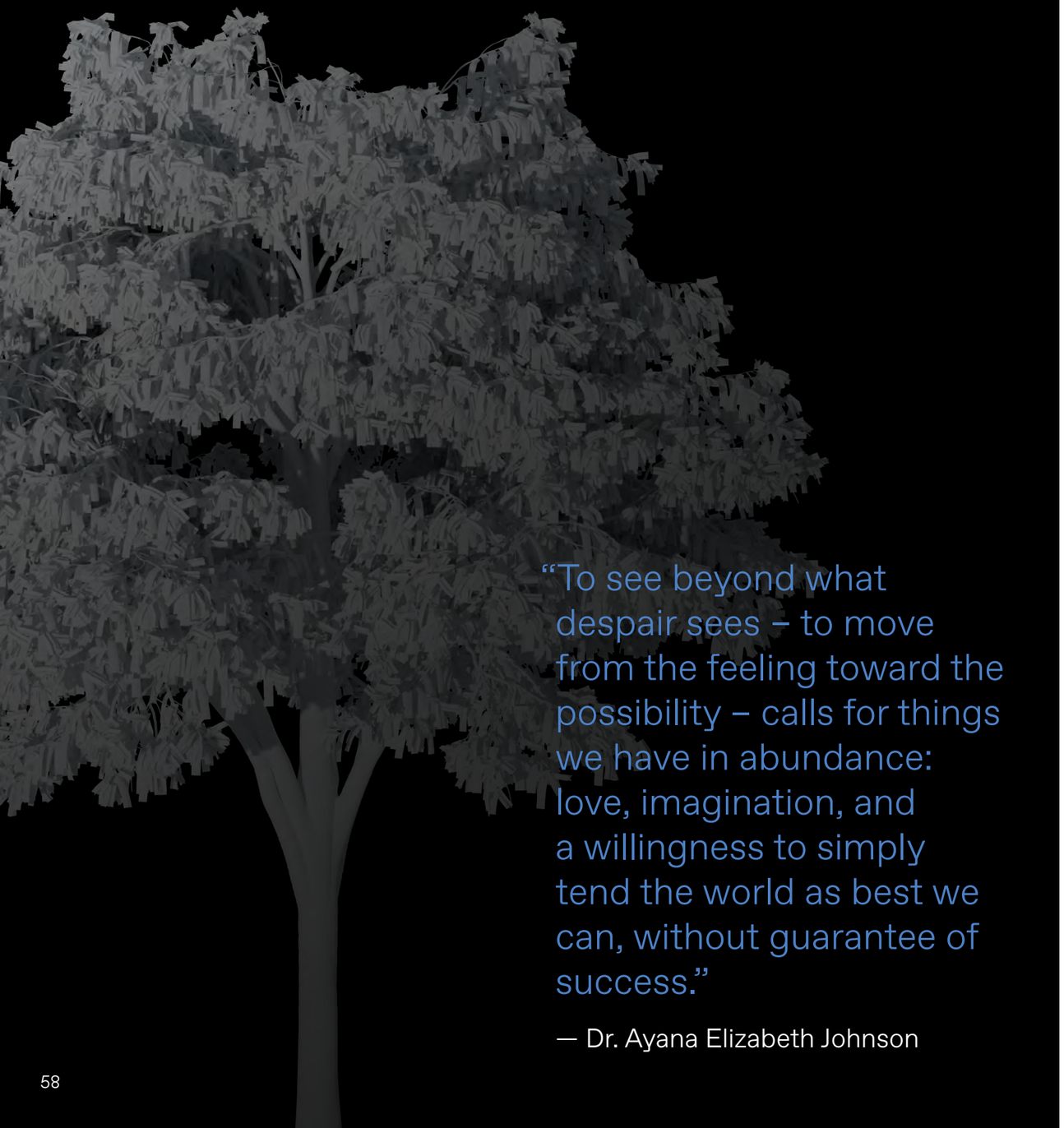
For instance, humans have the capacity to be both incredibly individualistic and remarkably cooperative. Individuals exist in a selfish-selfless spectrum and more often exhibit the traits we are rewarded for (Sonne and Gash, 2018). Thus, if humans are individualistic, it is likely because our society accommodates and rewards individualistic, selfish and competitive behaviour. For instance, in school, students are often tested on their own individual knowledge (Henricks, 2021), and in that context, collaborating with classmates is considered cheating and is often punished. If students were instead graded on how well they work together, perhaps this would shape our society differently.

One of the biggest barriers to change is the belief that nothing can change, that the "way it is now" is inevitable and fixed. Importantly, changing these assumptions would likely be met with resistance from those who may wish to keep the current system as it is for very real near-term economic or political gains and power relations (Babic and Sharma, 2023). To create lasting change, we must understand that our assumptions, beliefs and values are not set in stone and analyse the existing structures to determine who they really benefit. By reaching the bottom of the ToDC, we can step back from our current assumptions and see the risks they create for our world. We have the ability to move beyond the limits of these paradigms and embrace new ways of thinking, choosing paradigms that align with our desire for better futures (Meadows, 2008).

A crowd of people in an underground market in Istanbul, Türkiye. © visualstory / Adobe Stock

Chapter 5

Future visions



"To see beyond what despair sees – to move from the feeling toward the possibility – calls for things we have in abundance: love, imagination, and a willingness to simply tend the world as best we can, without guarantee of success."

— Dr. Ayana Elizabeth Johnson

If we recognize that our current assumptions create risks and understand our power to change them, the next step is to think of more desirable outcomes and radically imagine what a better world could look like. Having a shared vision of the future is crucial for organizing society, as it defines the boundaries of what we believe is possible (Harari, 2016). To create more hopeful futures, we need optimistic narratives that inspire belief in our ability to achieve it. For instance, science fiction, such as *Star Trek*, has portrayed hopeful futures with new technologies, which inspired real-life inventions like the mobile phone, portable music player and touch screen (Venables, 2013).

Today, we have many cultural imaginations of the future, not all of them hopeful. Facing the threats of increasing climate change, more conflicts, new pandemics and more, it is common to see stories about apocalyptic futures where human society and the natural world have collapsed, and people learn how to survive in the wreckage. This, in turn, creates the social structures and governance that centres around preventing those apocalyptic futures from becoming a reality (Gillam, 2023). For instance, the Paris Agreement represents an incredible achievement that sets collective, long-term goals to hold "the increase in the global average temperature to well below 2°C above pre-industrial levels" and pursue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels" (UN, 2015). However, one of the criticisms of these goals is that the agreement does not provide positive goals to achieve but instead sets limits to prevent the worst outcomes. Our ambitions for actions limiting climate change are also often incremental and insufficient to meet these limits (Geiges and others, 2020). This highlights the importance of setting goals that are inspired by visions of a positive future, combined with binding agreements to eliminate the root causes of the problem, for instance, by demanding a binding phase-out of fossil fuels.

We are culturally conditioned to limit the scope of possibility for potential futures, believing that radical change is "utopian" and ultimately unachievable (Finn and Wylie, 2021). To change this, we need to enhance our collective capacity for imagination to redefine what is possible for us to achieve. We do not have to settle for only *stopping* an apocalypse, *limiting* global warming, *reducing* inequality, *preventing* biodiversity loss and *avoiding* waste. We can instead radically imagine our world as a place we would enjoy living in, to redefine it as a possible and necessary goal to achieve. The solarpunk movement, for instance, is based on visions of a world that interconnects nature, art and technology. It imagines a world powered by renewable energy, such as solar and wind, with garden cities that promote biodiversity and provide food. Governance focuses on ensuring rights and justice for all people, future generations and even non-human life. Technology, such as automation and artificial intelligence, is used to free people from labour, allowing them to focus on creativity, self-expression and leisure (Gillam, 2023). Imagining a more desirable future has the power to shape our present decisions and actions, which plant the seed for those visions to become reality. What once may have seemed like an unattainable utopian dream can transform into a realistic expectation for the future (Cantó-Milà and Seebach, 2024).

We must acknowledge that there is not only one vision of the future, as every individual and group can imagine what they would like their future to be within planetary boundaries. The sections below outline our visions of the future based on how we interpreted the changes of **realigning with nature, rethinking waste, reconsidering responsibility, reimagining the future** and **redefining value.** These are not intended to be prescriptive, and indeed within these general topics, there is space for differing opinions and alternatives. The differences between visions can be points of contention but can also make them stronger, as humanity collectively decides what our ideal societies look like. We have proven it is possible to do so, evidenced by the adoption of Our Common Agenda and the SDGs in 2015, when we collectively embraced a global plan for action to shape a joint vision of the future.

The start of the research process, as outlined in the application of the ToDC, was deciding what kind of alternative outcomes would be desirable. Then, to achieve any imagined outcomes, it is necessary to go back to the roots of our systems to outline new goals and determine what new assumptions must be cultivated to accomplish them. The following chapter describes a desired reality based on our analysis of the five changes, and some examples of what it could look like in practice.

An elderly woman sewing with her granddaughter. © Quang Nguyen Vinh / Pexels

Section 5.1 One with nature

Imagine a world that has **realigned with nature**, where all life is valued and cared for. Humans live alongside the species and processes that we all depend on, and their lives are better for it. This world is full of life, where rivers and all kind of creatures can wander freely about the diverse and healthy landscapes. Resources and space are shared by all species, and ecosystems are resilient to shocks.

We can take inspiration from places where people live in harmony with nature. Karen Indigenous communities live next to the Ngao River in Thailand. For centuries, they have formed a unique relationship with the river and surrounding forest. Residents describe the river as the "heart" of the community (Duker and others, 2023) and feeling nourished by the sound of the water as though it were a lullaby (Ruenhom, 2024). Some people weave and dye clothes from natural materials such as roots and leaves and express pride in wearing nature's colours (Moepoy, 2024). Many of the Karen people feel as though they are guardians of their ecosystem, and have implemented various river conservation practices that have spread to over 50 communities in the Ngao River basin (Duker and Klanarongchao, 2022). Community protected areas in the Ngao River Valley were found to be effective in protecting fish. Surveys of 23 small reserves contained an average of 27 per cent more fish species and more than twice the density of fish than unprotected areas (Edmondstone, 2021). Karen community members advocate for the rights of the river to remain free from interventions that may harm the ecosystem and displace the communities, such as hydroelectric dams. They believe no one has a right to control the river and want to keep living in harmony with the gifts they have been entrusted to keep (Moepoy, 2024). While in many places the strong bond between people and nature has been lost, it is possible to **realign with nature** for the mutual benefit of people and nature. Examples of this exist all around the world, such as in Bali (Suartika and Saputra, 2019; Kubontubuh, 2023), in Colombia (MMADS, 2016; Sainsbury, 2024), in Kenya (Njagi, 2023; Tyrrell and others, 2024) and in the border area of Germany and Poland (Santos, 2021; Dunn-Capper and others, 2024).

Section 5.2 A world without waste

Imagine a world that has **rethought waste**, where the planet's resources are used mindfully. Humans only take what is needed, ensuring there is enough for everyone to use. All materials are kept in circulation or are regenerated, so that the overextraction of resources is halted and scarcity does not need to exist. Service objects are made from non-toxic materials, are designed to last, be mended and repaired and eventually disassembled and recycled for use once again. Biological products are made with respect to the ecosystem's needs, made to be used and consumed, only then to become nutrients for new products.

Pieces of this world are already in place at different scales. There are specific products, such as modular smartphones designed to be repaired, and business models, like zero-waste stores that have phased out unnecessary packaging. Whole communities are even moving towards a zero-waste lifestyle, producing as little waste as possible through practices such as composting, avoiding single-use items and mindful consumption (Zaman, 2023). Since 2003, the town of Kamikatsu in Japan has been working to eliminate their waste incineration and landfill use. They have achieved recycling rates of around 80 per cent, far higher than the national average in Japan of 20 per cent (Tomoyuki, 2023). Some of the strategies they employ for zero-waste living include composting and separating waste into 45 categories, as some materials are reused, repurposed or recycled. The town also has an upcycled clothing store, a free thrift system for residents to exchange clothes and a brewery that makes craft beer from otherwise-disposed crops (Ye Hee Lee, 2022).

Two people snorkel near mangrove trees on Orpheus Island, Australia.
© Matt Curnock / Ocean Image Bank

Two girls sitting on a bench near a body of water in the mountains.
© Susanne Jutzeler / Pexels

Section 5.3 Good ancestors

Picture a world that has **reimagined the future**, where our choices today ensure quality of life and opportunities for the generations of tomorrow. This world is designed to endure, powered by renewable energy sources, eliminating concerns about scarcity or waste. Future generations inherit a wealth of diverse knowledge, equipping them to face the challenges ahead. Similarly, the planet is resilient, with rich genetic diversity that helps it adapt to unforeseeable future challenges.

Similar to libraries or archives which collect, store and preserve our wealth of knowledge for the future, seed banks contain records of plant genetic diversity to preserve and treasure for future generations. Over 7 million genetic samples belonging to 50,000 plant species are stored in more than 1,700 locations worldwide (D'Angelo and others, 2024). The Svalbard Global Seed Vault on the Norwegian island Spitsbergen is the largest with the greatest capability to resist disasters, like floods or earthquakes, securing a portion of Earth's biodiversity for future generations. Many seedbanks have a high importance for the conservation of regional diversity and cultural heritage, such as The International Potato Center in Peru with more than 4000 edible varieties of potato, most of them originating from the South American Andes (Oakes, 2023; CIP, 2024). Seed banks also provide an open source of genetic information on a wide variety of crops. This information is not only useful for researchers of plant genomics, but can also help current and future communities identify which species and strains are best adapted to their climatic conditions. Many seed banks have curated collections around themes, such as those that can handle drought or those that thrive in an aquaponic environment (Greenwood, 2022). In this sense, they are intended to not only preserve diversity for the future, but also to set the future up for success in the face of climate uncertainty. Seedbanks are backup facilities established today with responsibility for the future in mind.

Section 5.4 Global neighbourhood

Imagine an interconnected world that has **reconsidered responsibility**, where national borders are no longer barriers to kindness and support. People and nations help each other, sharing resources and knowledge. The spirit of cooperation allows people to work together to tackle global challenges effectively and equitably. Both prosperity and hardships are shared, as humanity thrives together. This world is peaceful and safe for all who inhabit it.

We can see this spirit in the adoption and implementation of the Montreal Protocol (UN, 1987). Adopted in 1987, the Protocol regulates the production and consumption of nearly 100 ozone depleting substances. When released into the atmosphere, those human-made chemicals damage the ozone layer, Earth's protective shield from harmful levels of ultraviolet radiation from the sun. The Montreal Protocol is often considered the most successful international environmental treaty in history, and a model of international cooperation to jointly address a global challenge. One of the elements of its success is its global reach, as it has been ratified by 197 countries. It is also legally binding with respective penalties, and comes with financial commitment via the Multilateral Fund to support implementation of the Montreal Protocol by developing countries (Multilateral Fund, 2024). As such, the Montreal Protocol shows both successful global cooperation and global solidarity for a common goal and has led to steady improvements, with the ozone layer on track to make a full recovery by 2066 (WMO, 2022).

Section 5.5 Economy of well-being

Imagine a world that has **redefined values**, where society is based on compassion and care; where every person is valued, regardless of their background or circumstances. In this world, services like healthcare, education and social protection are freely available to all. Empathy guides policies, with the aim that every person has the opportunity to lead a life of dignity and fulfillment. Everyone has their basic needs fulfilled, while supporting the planet and opportunities for the future.

One example of this can be seen in the Compassionate Communities project in Frome, England. The Frome Medical Practice adopted a person-centred care plan, identifying people who were at-risk for unplanned admissions to the hospital; for instance, people over age 95 or those with chronic kidney disease (Abel and others, 2018). They additionally mapped over 400 services and activities in the local community, such as organizations to help manage debt or housing problems, choirs or exercise groups (Monbiot, 2018). Patients were then often prescribed participation in these groups so they could receive social support alongside their regular medical treatment (Relationships Project, 2020). From April 2013 to December 2017, emergency admissions to the hospital decreased by 14 per cent in Frome, even while, in the wider district of Somerset, there was an increase of 28 per cent (Abel and others, 2018). This also represented a 21 per cent decrease in healthcare costs in Frome, as well as over 80 per cent of patients reporting increased well-being and feeling more in control of their health.

Two men in a room filled with plants. © Huy Nguyen / Pexels

We have the opportunity to establish fresh assumptions that will allow our systems to evolve, define new goals that inspire us and create structures capable of producing better outcomes. To embark on this journey, we can allow ourselves to believe in the possibility of brighter futures without the fear of being seen as a “dreamer” or “too utopian”. The ToDC offers us a chance to step back from the constraints of our current reality, and envision the future we truly desire. It requires us to push the limits of our imaginations, stretch the boundaries of what is possible and radically believe that we can create the future we want.

An elderly woman is provided support by a caregiver at a retirement home.
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Chapter 6

Deep Change

"We live in capitalism, its power seems inescapable – but then, so did the divine right of kings. Any human power can be resisted and changed by human beings."

— Ursula K. Le Guin

As we have seen in the previous chapters, the world we currently live in is based on assumptions that produce disastrous outcomes. It is obvious that we need a new system, based on new assumptions, to transform our current world into something better, to achieve our desired outcomes and live happy, healthy and sustainable lives. We can see the better world ahead of us, but how do we get there?

As depicted in the ToDC, there are different ways to make these changes towards a desirable future, which we refer to as **levers**. As mentioned previously, though they can be found at any level, we found that the **levers** were most relevant at the **assumption** and **structure** levels. These are shown in ***Figure 5*** as **inner levers** which change the goals of the system and **outer levers** which bring them into practice. These inner and outer levers represent what we call **deep change**, in that they shift and enact the new goals of the system to aim for the desired outcomes.

This is in contrast to many current efforts which operate on the surface, centred on altering only the outcomes of the system, with interventions that attempt to make the world a better place without shifting the underlying goals of the system (Abson and others, 2017). As such, these changes rarely translate into whole system transformation (Göpel, 2016). At best, these interventions are fighting an uphill battle as the system works against them; at worst, they perpetuate the system. For example, recycling materials such as plastic or aluminium is often touted as a major solution to **rethink waste**. While recycling is an important strategy to reclaim materials, currently it is only altering the outcome of accumulating waste, reducing only the amount of waste. In fact, some studies show that having the option to recycle can even increase the *amount* of waste people produce (Ma and others, 2019; Maier and others, 2023). In this way, recycling is a ***surface change***, which works within the existing system without modifying or addressing the goals of the system; in this case, the need to produce and consume more. The surface changes are only transformative if they align with deeper changes to try to shift the goals of the system; for instance, from the goal of increasing consumption to one of believing resources are finite and using only what we need. In this case, deep change could be achieved if recycling aligns with a radical decrease of materials produced by industry and households. This may include urban mining to extract and reuse construction materials in cities or buying a reusable tote bag and keeping it, mending it and repurposing it. Therefore, ***deep change*** is needed instead, with actions that target shifts in the assumptions and goals of the system (Bristow and others, 2024), and structures that are able to reinforce and implement them. These actions would work to transform the existing system into something new, to completely change what is possible to achieve.

The restoration of the Melaka riverfront transformed a polluted river into a vibrant tourist attraction in Malaysia. © Mohd Nazri Sulaiman / TUC / UNU-EHS

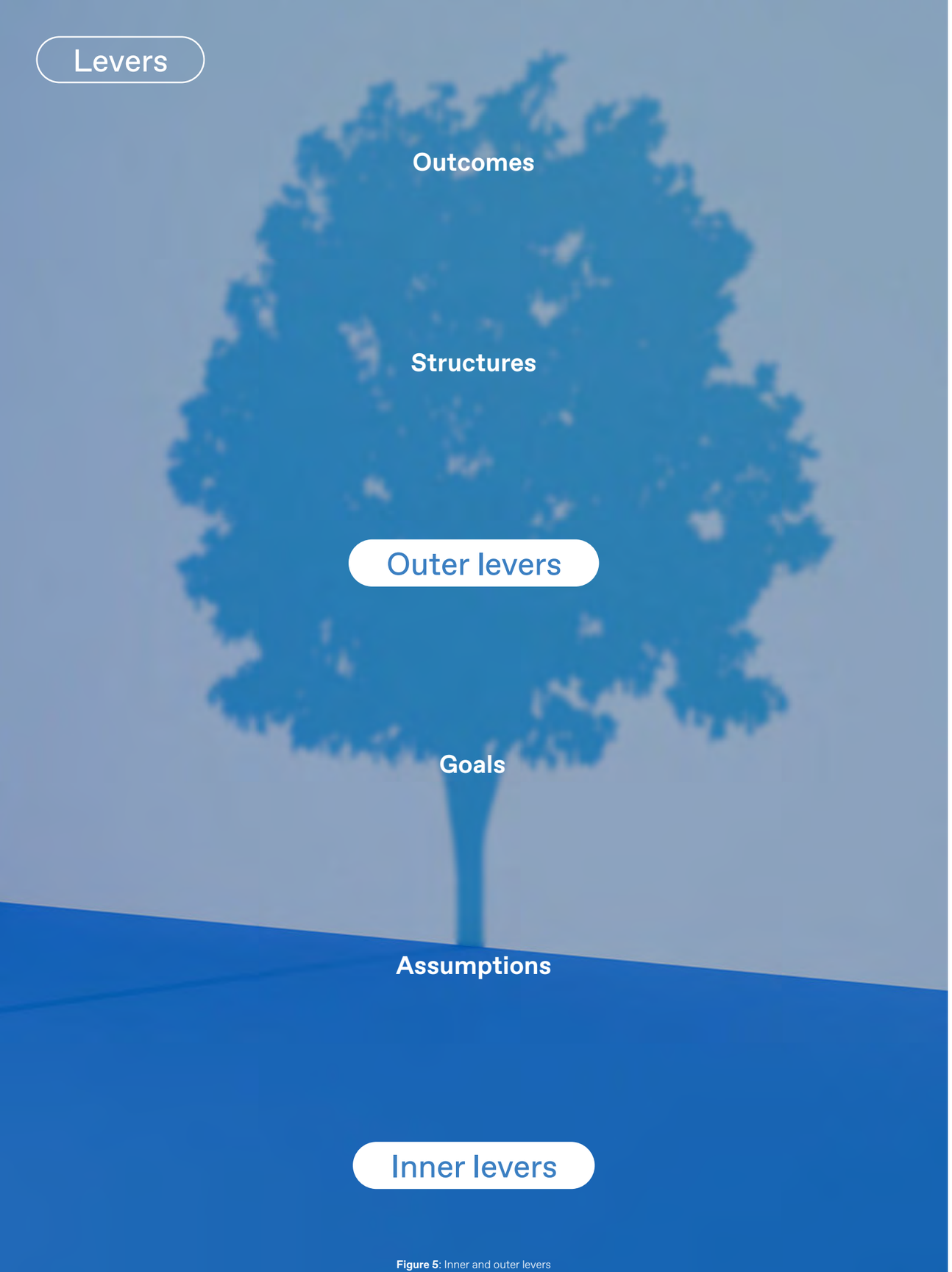


Figure 5: Inner and outer levers

Section 6.1 Inner levers

The most powerful levers act at the **assumption** level, to change our underlying beliefs and values that inform the goals of the system (Wright, 2010); cultivating the soil from which to grow a new tree. We call the interventions to shift these assumptions **inner levers**, and they represent the inner, individual change of beliefs and values. While assumptions are a powerful leverage point, on a societal level they are very difficult to change as it requires collective shifts in assumptions from many individuals (Leventon and others, 2021). Since the assumptions often represent the deepest held beliefs, values and understanding of the world around us, shifting these for large groups of people and whole systems takes a long time, requiring sustained effort and patience. Still, systems are made up of individuals, and changing our minds can happen in an instant. It only takes a shift in perspective, a new way of seeing, and the transformation has already happened (Meadows, 2008).

The perception of smoking cigarettes, for instance, has changed dramatically over time. In the past, it was widely accepted and often glamorized, associated with higher social status in many cultures. However, as scientific studies in the middle of the 20th century began to expose serious health risks like lung cancer and heart disease, attitudes shifted (Burns, 2014). This change occurred both individually and collectively, owing to public health campaigns. Today, smoking is largely seen as a harmful habit, and the number of smokers is declining almost everywhere (Ritchie and Roser, 2023).

Section 6.1.1 Care

The most commonly shared inner lever is the expansion of our boundaries of care. Here, “care” refers to attentiveness, regard and consideration for beings beyond ourselves (Moriggi and others, 2020). Care ethics acknowledge that everything exists in relation to each other and all things are interdependent (Tronto, 2017). While the dominant worldview often sees humans as isolated, competitive individuals (Horcea-Milcu, 2022), the shift could allow us to recognize our place within a network of relationships that sustain our lives and well-being.

This lever of care ethics is relevant for the changes to **reconsider responsibility** and **redefine value**, facilitating an assumption that we share the Earth with others and they deserve to be happy and healthy. The current dominant paradigm of neoliberalism centres upon individualism, so that individuals are responsible to care for themselves, or those immediately related to them (Tronto, 2017). However, we are all a part of a web of relationships to others, and we depend on the care of others to survive (Randall, 2019). To create a more equitable society where everyone’s needs are met, we can care about the needs and happiness of our fellow humans. The Universal Declaration of Human Rights was created with the understanding that everyone deserves a certain level of care (Hofstede and others, 2010); for instance, in terms of the right to social security (Article 22) (UN, 1948). While the rights-based approach provides an important baseline, empathy – understanding someone else’s situation from their perspective – is key to forming caring relationships. Humans have a natural propensity for empathy; we instinctively feel for those who are sick or injured, for people who are hungry or sad (Spikins, 2017). However, this does not mean that each individual must personally care *for* everyone; rather care *about* others’ needs and happiness (Noddings, 2010).

Recognizing that it is impossible for any one person to care for everyone and that it is easy to feel overwhelmed by such expectations, a systems-level approach presents itself as more powerful. Our societal systems, such as governments, can take on the collective responsibility of ensuring care for all. Governments, being more resilient and capable of balancing resources, are better equipped to create and maintain systems that distribute care efficiently (Noddings, 2010). This includes a rethinking of the care economy by valuing unpaid care work and investing in quality care as part of public services and social protection (UN, 2021). In that sense care can be seen as something precious, which is highly valued work in society with plenty of resources allocated to it. Adopting an ethic of care is essential to grow a new system in recognition that everyone in the world deserves to be cared for, and we can set up the goals and structures accordingly.

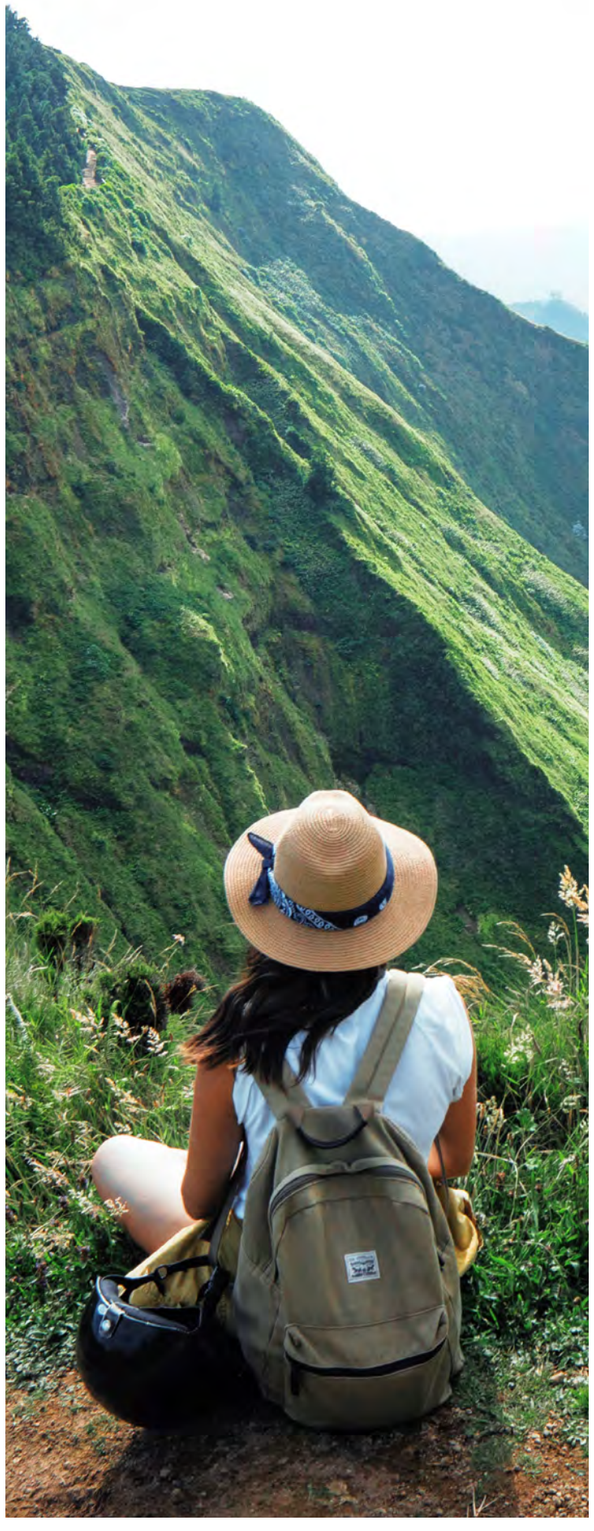
Our actions affect not only those we share the planet with today but also the billions or trillions of future humans yet to be born (Krznaric, 2020). Developing an ethic of care for future generations is essential for **reimagining the future**. While we cannot predict their exact needs, we know that some current actions harm the environment and negatively impact people today, making it likely that continuing these behaviours will also harm future generations (Bell, 1993). Like us, they will need basic necessities such as food, shelter, clean water, a healthy environment and healthcare. Therefore, we can extend care beyond the present to include future generations, taking responsibility for decisions that increase the likelihood of meeting their needs (Randall, 2019). Individuals can make decisions that benefit the future, such as planting trees that they themselves might not see mature or through farming practices that encourage the regeneration of the soil. However, while an individual person

is limited by their lifespan or level of agency, institutions, such as organizations or governments, have much more capacity to make long-term decisions that care for future generations that they may still be around to see (USEPA, 2010). Our new system can cultivate a baseline assumption that we care for future generations, and the goals and structures can follow suit.

We can extend our ethics of care by including non-human beings as part of an effort to **realign with nature**. We already demonstrate this to some degree when we care for pets or express outrage at animal abuse (Hofstede and others, 2010), which reflects an understanding that these beings deserve care and protection. Even this consideration, though, often relies on ascribing the other being with human-like traits (Blink, 2023) such that we care more for animals that follow our human definition of "intelligence" (Hoffmann, 2022). This does not mean that we must prioritize caring for other species' needs above our own needs – but rather that we must strike a balance. After all, humans still need to fulfill basic needs such as food, warmth and safety, which often necessitate placing our needs above those of certain other organisms. However, by adopting a care ethic towards non-human beings, we acknowledge their inherent worth. This means we should not view them merely as resources for human use but as fellow members of our planetary community, deserving of consideration and the opportunity to maintain a healthy existence within the ecosystem (Taylor, 1981).

Traditional ethics of care often extend only to *beings*, or things that are defined as "alive" and can pursue their own goals. However, we can also extend our boundary of care to include inanimate objects to achieve the goals of both **realigning with nature** and **rethinking waste**. These parts of the planet, such as mountains, rivers, stones or wind, play an integral role in ecosystem functioning (Smith and Gough, 2015). Therefore, we can care about a river or a mountain and ensure they are able to support the health of the ecosystem. This is already occasionally represented by granting them legal rights, creating a recognition of them as a being and therefore the responsibility of caring for them (Benöhr and Lynch, 2018; Roy, 2017b).

We also often care for human-made objects when we keep and care for sentimental items such as our grandparents' tea kettle or our childhood toys. We often form attachments with certain objects, even giving them names (Hymes, 2022) and assigning them personalities (Sepahpour and others, 2021). These objects mean something to us, so we treat them with respect. Care in this regard often manifests as maintenance, in giving attention to an object's healthy normality and attempting to maintain it with actions to mend, repair or refurbish them (Callén and Criado, 2015). Importantly, caring for the maintenance of an object also requires that we design it with the capacity to be maintained (Denis and others, 2015).



A hiker takes in a view on São Miguel, Azores, Portugal. © sztnknmi / AdobeStock

Section 6.1.2 Sufficiency

Another common inner lever is the adoption of a sufficiency mindset (Tröger and Reese, 2021), defined as having the drive to satisfy the essential needs to live comfortably and prioritizing quality of life, rather than striving to meet infinite material wants (Bocken and others, 2022). While we designate this as an inner lever that individuals can adopt to shift their priorities and be mindful in their actions and behaviours, it also requires a societal-level consensus to determine what is an "essential" need (Hayden, 2019).

This inner lever can help in the shift to **redefine value**, as we are more readily able to question what we really need to be healthy and happy. A certain level of economic growth has increased the standard of living for many, corresponding to better health, education and social support (Hall, 2015). However, it has been shown that increasing gross domestic product (GDP) or national income per capita does not infinitely increase national happiness or well-being (Layard and De Neve, 2023). Adopting a sufficiency mindset can therefore help to shift our priorities from endlessly striving to increase GDP to focus on methods to actually increase people's happiness directly. Indeed, instead of focusing on increasing material production, countries and communities could focus on improving the distribution of these materials (Casal, 2024).

The sufficiency mindset also matters in the effort to **reconsider responsibility**, as the wealthier parts of the world will need to make space for the poorer parts to catch up to an acceptable standard of living (Marchese, 2022). There is not enough space or enough resources in the world for everyone to adopt the lifestyle of the average person in the United States or Germany (Earth Overshoot Day, 2023), so making this inner change towards sufficiency will require that some of us give up certain luxuries and habits so others are able to enjoy basic necessities (Monbiot, 2021). For instance, higher incomes are associated with higher meat consumption, and the livestock industry is a major contributor to global greenhouse gas emissions (Holland, 2022). To mitigate the effects of climate change, many wealthier individuals will likely need to significantly cut back on the amount of meat they eat. In the current system, this may impact well-being and happiness for some, so instead of pursuing the "green growth" myth of increasing economic growth while avoiding environmental impacts (Parrique and others, 2019), we can find ways to decouple consumption levels from happiness and well-being through a mindset of sufficiency (Fanning and O'Neill, 2019). This is what is meant by the "doughnut economics" model: there is an inner boundary representing the foundations of human and social needs, below which would deprive people of fundamental needs, and an outer boundary representing the environmental ceiling, beyond which environmental degradation would occur (Raworth, 2012). A safe and just space for humanity lies between these two boundaries, in the "doughnut" of inclusive and sustainable development of societies.

A shift to sufficiency is also necessary to **rethink waste**, since reassessing our needs is ultimately done with the intention to reduce our consumption of raw materials and energy (Gorge and others, 2015). Sufficiency is a core principle of the zero-waste movement (Tat, 2023), encompassing strategies to avoid demand for critical resources (IPCC, 2022). This naturally also helps us to **reimagine the future**, by preserving and restoring resources and opportunities for future generations. The very definition of sustainability for the UN is "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (UN, 2024b). Adopting this sufficiency mindset helps us determine what we truly need today so we can manage the resources sustainably into the future.

Section 6.1.3 Humility

Humility is another inner lever that was shared between several of our cases. In this sense, humility means a belief that something greater than the self exists and life is approached from an interdependent and relational perspective (Nielsen and Marrone, 2018). This is in direct contrast to the current dominant exceptionalist paradigm (discussed in **Chapter 4.1**), emphasizing the need to de-centre ourselves from our view of the world.

This is most obvious in the case for **realigning with nature**, as human supremacy and human exceptionalism are central to the damaging assumptions of the current reality. A humility-based approach would instead foster an appreciation of humans as a single animal among many in the ecosystem, occupying a particular niche yet connected to the other species and processes in which we live (Nielsen and Marrone, 2018). Recognizing that humans are not inherently superior to the rest of the natural world allows us to acknowledge that other species and ecological processes have interests that deserve consideration (Martin and others, 2016). Similar to care ethics, this perspective, known as "eco-centred" ethics, emphasizes our moral obligation to care for and respect non-human beings as individual parts of a larger whole (Taylor, 1981), and is essential for sustainability (Washington and others, 2017). One example of this lever can be seen in the way many Aboriginal Australian peoples believe that the natural world around them, the air, trees, rocks, animals, water and landforms, are an extension of themselves (Asher, 2023). As such, when they look at the landscape, they feel part of it, and often describe a sense of

kinship or relatedness beyond biological links, in such a way that a person could consider a kangaroo as a "brother" or a "sister" (Kohen, 2003).

A similar logic can also be applied when we **reconsider responsibility**. Just as with nature, all of us humans inhabit the same planet and ultimately share the same fate. No human is inherently superior to another - race, gender, nationality and class distinctions are social constructs invented and supported by our current systems (Pearce, 2022). A sense of humility has been found to increase cooperative behaviours, fairness and forgiveness (Wright and others, 2017). Cultural humility, for instance, is an ongoing commitment to rebalance power inequities and relinquish "expert" or authoritative positioning and develop collaboration on equal footing (Tervalon and Murray-García, 1998). This would help make tackling global issues, such as climate change, more inclusive and more respectful of local needs.

This inner lever is similarly needed to **reimagine the future**, as we must be able to place ourselves in the context of the chain of generations. Our lives are shaped by those who came before us, and we lay the groundwork for those who will follow (Slaughter, 1994). The nearly 8 billion people alive today are dwarfed in comparison to the trillions of potential humans who are likely to exist in the coming centuries (Roser, 2022). Intergenerational justice requires the balance between the concerns of the present with the potential interests of the future, and intergenerational humility allows us to more accurately assess our value in relation to both past and future others (MacKenzie, 2017).

Section 6.2 Outer levers

While the most powerful leverage points are at the assumption level, changes are also needed at the structural level to bring the new goals of the system into practice. These **outer levers** represent how to translate the new goals into practical structures to produce more desirable outcomes.

Change can also start at the structure level, as seemingly small changes in the structure may spark the imagination of what is possible and gradually change our reality. A famous example is Gandhi's salt march to Dandi for which he was able to mobilize people of diverse backgrounds around the idea of removing tax and British monopoly on salt. While the question of tax on salt seemed small against the overall issue of colonial power in India, the idea was able to unite many, which ignited a wider change towards self-governance (Rather, 2022). It also showed that the monopoly of salt and the salt tax existed only because of the consent of the Indian people (Watkins, 2005). Once the consent on tax was broken, other changes in governance appeared possible.

These outer levers can take many forms, as diverse as the imaginations of the people that enact them. The below sections provide a brief glimpse into a few themes we recognized in our research of outer levers. These are some of the ways we could create new structures based on the goals of the envisioned system to produce more positive outcomes in the world.

Section 6.2.1 Governance

One of the main places outer levers can be pulled for structural change is in our governance systems, such as laws, tax systems or subsidies. For instance, one of the outer levers relevant for **realigning with nature** is to consider the rights of non-human beings within our government systems, which can be used to create respective laws. In 2017, the Ganges and Yamuna Rivers in India and the Whanganui River in New Zealand were granted legal personhood, allowing them to be considered rights-holding, living entities (Roy, 2017a; Safi, 2017). This means that activities that harm the rivers, such as pollution, can be considered as serious as harming a person (Sen, 2019; Bajpai, 2020).

Governance on a global scale may also be needed as an outer lever in some cases; for instance, to regulate the impacts of solar geoengineering in attempts to **reconsider responsibility**. There is growing interest from scientists, governments and businesses in the research and deployment of solar geoengineering technologies, such as spraying sunlight-reflecting aerosols in the Earth's stratosphere to lower average global temperatures (UNEP, 2023). A large-scale deployment of such interventions is full of scientific uncertainties and ethical concerns. Potential impacts will likely vary across the world, as the artificial cooling will affect some regions more than others and there are uncertainties about the effects on regional weather patterns, and the provision of food and water (Biermann and others, 2022). Their use would also likely concentrate power in the hands of a few major players capable of using the respective technologies. There is a need for an anticipatory governance of solar geoengineering; however, there are conflicting rationales on whether to enable or restrict its use (Gupta and others, 2020). Recently, there has been a growing commitment to establish a global agreement on the non-use of solar geoengineering. Establishing this global agreement could prevent planetary-scale risks by instead focusing on the root causes of climate change, **reconsidering responsibility** and thus preventing planetary-scale interventions being carried out unilaterally by a single nation or enterprise.

Subsidies can similarly influence structural change, for better or worse. For example, in 2022, global subsidies of over $1 trillion have flowed to fossil fuel industries, keeping the system running and climate change further unfolding (IEA, 2023a). One outer lever for **reimagining the future** could be the removal of these harmful subsidies, and redistributing the economic interventions to create structures of cleaner, low-carbon and renewable energy sources, reducing global greenhouse gas emissions. Denmark, for example, has made ambitious commitments to phase out oil and gas exploration completely, shifting their fossil fuel subsidies to investing in renewable energy technologies, predominantly to wind energy. Denmark is also the founding member of the "Friends of Fossil Fuel Subsidy Reform", an international advocacy group to phase out fossil fuel subsidies altogether (FFFSR, 2024). Between 2015 and 2022, Denmark has reduced fossil fuel subsidies by around 23 per cent, equivalent to roughly 150 million euros, bringing them closer to their goals of generating 100 per cent of their electricity from renewable sources (EEA, 2025).

Similarly, taxes can also work as an outer lever for more structural change. In efforts to **redefine value**, some taxes work to implement sufficiency in practice and create a structure of more equitable wealth distribution. In Wales, United Kingdom, for instance, owning a second home is discouraged through the implementation of high council and land transaction taxes (Hayden, 2024). Portland, Oregon in the United States has implemented a surtax to business license taxes when a CEO's compensation is equal to or greater than 100 times their median worker's compensation. The additional tax ranges from 10 per cent for a pay ratio from 100 to 1, and increases to 25 per cent if the pay ratio is above 250 to 1. The proceeds of this tax are used to support the Joint Office of Homeless Services in Portland (Kall, 2016).

Additionally, today's tax systems fail to tax super-rich individuals effectively, for example, partly due to the lack of international coordination to address this issue. A recent study proposes an internationally coordinated standard tax for the super-rich. Around 3,000 individuals with more than $1 billion in wealth would need to pay tax equal to 2 per cent of their wealth, which would raise $200-250 billion per year globally (Zucman, 2024). International cooperation on taxation helps to prevent global tax competition, which is particularly helpful for relatively small and lower-income countries with limited possibilities to enforce taxes on non-residents. Thus, the implementation of a global tax standard for super-rich individuals is an outer lever that could help to **reconsider responsibility**.

Decisions related to climate change mitigation and adaptation or nature conservation involve trade-offs between current costs and benefits and potential future benefits. The balance of these trade-offs is reflected in the debates around "social discount rates" applied to long-term investments and decision-making. Changing the discount rate is a powerful outer lever, particularly essential for **reimagining the future**. Discounting essentially reflects the opportunity cost of waiting to receive financial benefits sometime in the future. Depending on the discount rate selected, investing for the future can seem more or less attractive. For example, at a 5 per cent discount rate, economically, it is not worth making an investment of $10,000 today to ensure benefits of $1 million in 100 years (Polasky and Dampha, 2021). On the contrary, calculation motivated by arguments related to intergenerational equity often use low discount rates. A lower discount rate favours spending for immediate actions that have long term benefits, such as rapidly reducing greenhouse gas emissions (Stern, 2007).

An apple picker proudly shows off some of his harvest. © Nishant Aneja / Pexels

Section 6.2.2 What we measure

Other types of outer levers help change the focus of our attention and efforts. For instance, changing what we measure and what indicators we use can create and destroy structures. While they are often represented as "objective" and "neutral", choosing what and how we measure represents a choice that this *thing* is worth measuring (Davies, 2015). Simply the act of measuring something, like height and weight, population growth or number of sales, means that we approach it as something valuable (Brighenti, 2018).

For example, measuring a country's progress using gross domestic product (GDP) rewards efforts that increase economic output and consumption, whereas measuring progress using indicators for happiness or resilience would mean investing and rewarding efforts that improve those traits (Brighenti, 2018). The Gross National Happiness (GNH) index, for instance, was launched in Bhutan in the 1970s. The GNH measures 33 indicators on topics such as psychological well-being, health, education, time use, cultural diversity, ecological diversity and living standards (OPHI, 2024). The government in Bhutan aligns its policies and resource allocation according to the results of the calculation. For instance, if the index shows a low level of psychological well-being, then policymakers prioritize initiatives to address this issue (OPHI, 2024). In this way, changing indicators of progress could be a relevant outer lever to create structures that increase well-being, helping in the change to **redefine value**.

Similarly, measuring the value of a forest in economic terms means that we prioritize optimizing the economic value and overlook the other contributions a forest provides to other organisms on the planet, humans included. Valuing and measuring the forest beyond its economic value brings us closer to the real contribution of a forest to the web of life. In 2015, experts in IPBES presented the concept of Nature's Contributions to People (NCP) to do just this. The NCPs encompass all the benefits and detriments that people receive from nature (Díaz and others, 2018). The list of 18 NCPs include categories of material and non-material contributions as well as instrumental and relational values, ranging from food provisioning to spiritual inspiration (Díaz and others, 2018).

Women dressed in traditional clothing gather for the celebration of Irreecha, the Orom people's thanksgiving holiday in Bishoftu, Ethiopia. © Amanuel Sileshi / AFP

Section 6.2.3 Education

Education is another powerful lever which helps people develop the core competencies that allow them to actively engage with the world and foster deeper understandings of each other and the interconnectedness of our world. Individual learning is needed for the inner levers discussed in **Chapter 6.1**, but the way we learn and how education is structured can equally influence change. We can foster a new type of literacy helping to undertake the five changes discussed in this report. This may involve education of a different kind that looks to reflect on current behaviours and assumptions that are deeply embedded in the prevailing systems.

For instance, **reconsidering responsibility** can be supported by an outer lever of a new type of education, enabling a better understanding of interconnectedness across the globe. Global citizenship education is a concept and method to nurture respect for all, build a sense of belonging to a common humanity and help learners become responsible and active global citizens. It furthers the understanding, skills and values citizens need to be able to cooperate in resolving global challenges such as climate change, conflicts, hunger or issues of equity and sustainability (UNESCO, 2015). Global citizenship education is also understood as an educational theory of a common good. The respective value-based curriculum design should be based on mutuality and reciprocity. Doing so, it could relate to the concept of "el buen vivir" – focusing on behaviour that is community-centric, ecologically balanced and culturally sensitive (Bosio and Torres, 2019).

Importantly, education does not always happen within a classroom or through textbooks. In fact, some of the most valuable learning comes from the world around us, from our families and communities or the collective knowledge passed down from previous generations (Bosio and Torres, 2019). Preserving as much of our current knowledge and learning for future generations to build upon is one way of **reimagining the future.** Much of the world's local knowledge and learning activities are passed down in daily living or through cultural heritage – stories from elders or songs from the past. Storytelling and oral history are powerful tools of non-traditional learning that keep cultural traditions and knowledge alive (Osei-Tutu, 2023). Engaging in storytelling and non-traditional education can also help children better understand the world, values, empathy and a sense of belonging (Jirata, 2013). For example, the Sámi people in northern Sweden have a long tradition of passing down knowledge about how to live sustainably through storytelling (Hofman-Bergholm, 2022). Long before sustainability became a globally recognized term and a goal, they used the term "árbediehtu" to describe the rich knowledge of nature, culture and everyday life. This Sámi belief of preserving biodiversity and ecosystems is necessary for human existence, health and well-being, and has been passed down through generations.

Nature education is a strategic outer lever for **realigning with nature**, providing knowledge and opportunities for learning. Forest schools are outdoor education models in which students visit natural spaces for experiential play and place-based learning (MacEachren, 2013). Models for the school vary widely, but generally include formal lessons combined with free play where students can explore the forest, climb trees and observe different creatures (Benke, 2023). It has been proven that spending time in nature fosters pro-environmental behaviours and a sense of respect and responsibility towards the natural world (DeVille and others, 2021). It can also improve children's self-esteem and confidence (Dabaja, 2021), reduce obesity (McCurdy and others, 2010), improve cognitive development (McCormick, 2017) and enhance immune system regulation (Roslund and others, 2020).

Section 6.3 Interconnectivity

Viewing the world as interconnected and interdependent is an important foundation for both the inner and the outer levers discussed in the previous sections. Highlighting five distinct desired outcomes, such as a world without waste or a global neighbourhood, does not mean pursuing these changes in isolation nor having five separate sets of levers. Adopting the inner lever of a care ethic could be useful for all five of our cases, and an outer lever of stewardship is relevant for at least three cases (see Technical reports for details). Rather than viewing individuals as separate from each other and their surroundings, our reality can be based on principles of interconnectedness and entanglement (O'Brien and others, 2023). Instead of treating problems as separate, isolated events, we can take interconnectivity as the starting point and build our systems from there (O'Brien, 2020). For instance, recognizing the relationality and interdependence on nature can help establish a care ethic between humans and their environment. Nature is made up of entanglements, from food webs to nutrient cycles and pollination to migration. Humanity is reliant on nature to survive, as it provides us with clean air and water, a stable climate and food, to name a few (Fauna & Flora, 2024). Individuals that notice their interdependence on the environment are more likely to engage in behaviours that support environmental well-being (Davis and others, 2009), which is necessary in the effort to **realign with nature**. Additionally, since the world is vastly interconnected, interventions in one area can have knock-on effects through whole ecosystems and landscapes and sometimes even further. River channelization, for instance, often alleviates

flooding in one section of a river at the expense of flooding downstream (Mosley, 1998). Acknowledging and working with these interdependencies can help reduce unexpected outcomes and increase resilience in the system.

This interconnectivity is also evident between nations and distant communities in our globalized world. While in the past humanity was fragmented and largely lacked the power to influence each other's lives, our recent advancements in technology and trade mean that actions taken in one part of the world can affect places far away. For instance, land-use decisions in tropical forests like the Amazon not only influence the regional environment, but also affect the global climate by increasing greenhouse gas emissions and changing precipitation patterns (UNDP, 2024). Even the land-use decisions themselves are not just local, but influenced by global demand pressures (Schuetze and Walz, 2021). Global challenges, such as climate change and biodiversity loss, do not discriminate their impacts on humanity and we all share a similar fate (Haydon, 2006). Recognizing the interdependence of our actions is necessary to **reconsider responsibility**, as cooperation on the global stage is necessary to tackle global problems to manage our shared fate.

Recognizing and supporting interconnectivity is also similarly relevant for **redefining value**, as our connections to other people are essential for our well-being. Human beings are neurologically hardwired to form close relationships with other beings (Jordan, 2023). Loneliness and social isolation have been shown to have negative health effects, impacting mental health by increasing rates of depression and anxiety. There are also ramifications on physical health, with increased cognitive impairment, poorer sleep quality and higher rates of mortality associated with social isolation (Park and others, 2020). Social connectedness is, therefore, a key determinant of well-being, and encompasses regularly interacting with others, being supported by others and feeling a sense of belonging (Frieling and others, 2018).

Recognizing this interconnectivity also means that our tendency to design systems with only a single objective is destined to fail. For instance, we often designate land for a single purpose, such as food production, biodiversity protection or carbon capture (WBGU, 2021). Monoculture plantations are often used as a simple way to boost food production, but they degrade the soil, reduce biodiversity and increase the risk of disease and pest outbreaks (Balogh, 2021). Similarly, planting or conserving forests for the sole purpose of carbon offsetting can not only undermine local ecosystems but also violate Indigenous land-use rights, disrupting livelihoods and traditional practices – such as farming, foraging and cultural rituals – that are deeply tied to the land (Dunne and Quiroz, 2023; Kleinschmit and others, 2024). In an effort to **realign with nature** and **reconsider responsibility**, we could instead redesign our systems to benefit from the interdependencies of life and meet multiple needs at once. For example, polycultures – agricultural practices where multiple crops are grown together – are not only able to produce food but also support ecosystem needs, such as providing habitats, increasing soil fertility and controlling disease (Iverson and others, 2014). Mixed forest systems have also been shown to sequester more carbon than monocultures (Warner and others, 2023), and multi-use forest management is a key strategy to offset carbon and increase biodiversity while supporting local livelihood needs (Fischer and others, 2023; Sabogal and others, 2013).

Some of our actions can use the interconnected nature of our systems to our advantage, allowing us to work towards multiple objectives at once. For instance, opting for larger household sizes can have many positive outcomes. Combining elder care and child care, for example, can achieve multiple benefits in the shift to **redefine value**. Research has shown that intergenerational programmes decrease social isolation in older adults and improve children's well-being. For older adults, it can increase one's sense of belonging, self-esteem and overall well-being. Children in such programmes are shown to have improved social and emotional skills (Jayson, 2018) and better reading scores (Steinig, 2006). Not only would such an intervention increase people's well-being, but it can also work to **rethink waste** and reduce the amount of resources we use. As food and kitchen space are shared, this reduces food waste and energy consumption (Norouzi and Angel, 2023). Sharing the same building, rather than two separate ones, also saves resources for electricity and heating (Johar and Stancic, 2024). Household sizes vary widely, ranging from 1.8 individuals per household in Denmark to 8.4 in Senegal, but are declining globally (Esteve and others, 2024). Households with more individuals usually have lower per capita carbon emissions due to the sharing of living space and resources (Ivanova and Büchs, 2022). Therefore, increasing the number of shared households in places with the highest rates of single households, such as in Europe and the United States (Cohen, 2021), could make a significant contribution to reducing emissions (Ivanova and Büchs, 2022) and to **reconsidering responsibility**.

A woman smiles in front of her market stand. © Ali Alcántara / Pexels

Chapter 7

Conclusion

"Don't panic!"

— Douglas Adams

This report has analysed some of the current assumptions that characterize our societies and the negative outcomes that they can produce. It also explored visions of a sustainable and just future with more desirable outcomes. We have shown a few examples of the changes that can be made to transform the current realities into those future visions. These changes are presented at face value, as though they are easily done, but of course this is far from the truth. To make any desired future possible, we need to work for it. We need to radically imagine a better world and try, in every way possible, to take action towards realizing it.

The inner levers discussed in **Chapter 6.1** represent an opportunity for everyone to feel empowered and contribute to systemic change, but the responsibility of this change cannot be placed on single individuals. Change is needed on the system level, and individuals attempting to enact a new system will always meet resistance from the existing system, limiting how much we are actually able to achieve (Boda and others, 2022). While some individuals in positions of power may be able to pull certain outer levers on their own, most are not in the position to make sweeping societal changes. In fact, the people most vulnerable to social and ecological risks often lack the resources and empowerment to be able to address them (Strazzante and others, 2022). When those in power do make changes, it can often be ineffective or contentious as imposing change tends to be met with resistance. Yet, changes that individual people or groups choose and deeply care about are more likely to be embraced and endure (O'Brien and others, 2023). The success of reaching the desired future largely depends on who is shaping it.

Therefore, the shift to a desired future can start with changing the hearts and minds of individuals, as one person can adopt and model a behaviour which makes it easier for others to follow. Full systems change often requires a critical mass of people, after which the behaviour becomes default and normal for the community (Lenton and others, 2022). This type of shift can be cultivated through grassroots movements, social influence and education. The ToDC is meant to start within individuals to motivate us to engage in collective action and to find or create communities with others who also want to adopt new assumptions, goals and structures. This way, transformation can come from the bottom-up, from many individuals coming together around a shared vision (El Khoury, 2015), creating a movement with collective social power that alters the structures of a system (Boda and others, 2022). Additionally, the inner and outer levers can influence each other in the interplay between mindset shifts and structural change (Klitkou and others, 2022). Changing underlying mindsets, such as respecting nature, is imperative to the success of the structural changes. In turn, these structural changes, such as payments to farmers for environmental protection, can challenge or influence established mindsets (Abson and others, 2017).

The inner levers can be "pulled" on an individual level by approaching the world with an open mind and genuine curiosity. Stepping back from learned biases opens us up to the possibility of learning something new, and luckily there are plenty of communities and concepts already established that we can learn from. For instance, for **reimagining the future**, many societies already adopt an ethic of care for future generations. For instance, the Haudenosaunee Confederacy, a league of Native Americans and First Nations peoples in the north-eastern region of North America, have a core value known as the Seventh Generation. This principle says that "each generation is responsible to ensure the survival for the seventh generation" (Clarkson and others, 2001). Chiefs of the various nations consider how decisions

A group of smiling senior people dancing while enjoying activities in a retirement home.
© Seventyfour/ Adobe Stock

made today will impact their descendants, and people are taught that the world is borrowed from future generations, so it must be treated with respect (Haudenosaunee Confederacy, 2021). Similarly, we can pull this inner lever within ourselves, and change our mindset to ensure that our actions today safeguard the lives of those within the seventh generation ahead of us and beyond.

As individuals, we can shift our own assumptions and values, but it also must be acknowledged that, as discussed in **Chapter 3.1**, these assumptions are socially constructed so the knowledge, assumptions and beliefs of the current system have already been established in our minds. For instance, if you live in a home with a lawn or a sidewalk in front, you may consider some of the plants that grow there to be "weeds" and may actively buy products to get rid of them. Social pressure could come from advertisements for herbicides and neighbours that praise a pristine and well-manicured space (Burr and others, 2018). These interactions solidify the idea that certain plants are bad and do not belong in a space, despite the fact that many individuals follow this idea, spending time, effort and money to uphold an assumption they may have never noticed they held. As the assumptions and goals of the current system are likely subconsciously ingrained, they are hard for individuals to overcome. Therefore, we must often undergo the much more difficult process of *unlearning* the old assumptions before we are able to learn something new (Hofstede and others, 2010). While it is not possible to "unlearn" something in the literal sense, we can recognize that our behaviour and values are driven by past experiences and knowledge gained through life, and reduce the influence that the old knowledge has on our decision-making (Grisold and Kaiser, 2017). Even recognizing the bias that our current assumptions bring is a great start.

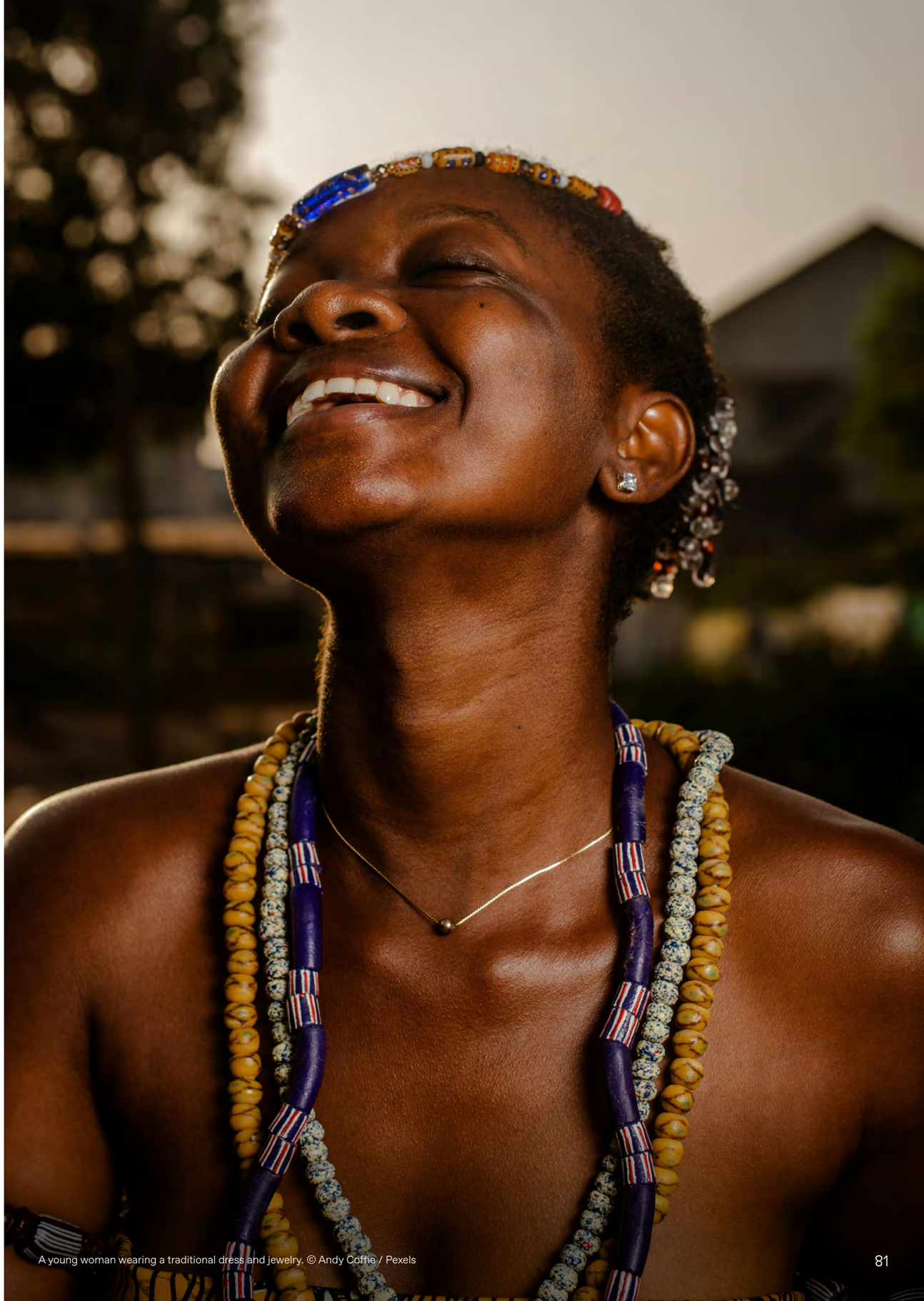
Once we have achieved this, we may find ourselves between a rock and a hard place where we have learned enough to know how bad the situation is, making it feel hopeless (Dunning, 2011). Research has shown that the public currently disproportionally hears about a narrow slice of science: mostly from the natural sciences, and mostly negative projections on climate change or biodiversity loss (DeWeerdt, 2023). It is easy to feel this way in the face of so many interconnected risks. The challenges our world faces today – from climate change, to pollution, to inequality – are so deeply rooted in our societies that they can seem impossible to overcome and it is difficult to imagine how we can change the outcome. Today's solutions and actions can feel like pruning a dead tree.

One step further would be that we already know what could be done to make the situation better, but the implementation is full of conflicts of interest, anxiety and grievance. This place is sometimes called the Delta of Doom (Göpel, 2024), where we know there could be a path out of the current reality, but struggle to actually find and follow it. The Delta of Doom thus bears a great risk of stopping the change process due to all the hurdles and conflicts, and needs strong governance to support change towards better outcomes. However, as this report has discussed, many of these risks are socially constructed, which means they can be reshaped from the roots to the fruits. Change comes from realizing that it is possible, and being determined to take the necessary action to see it through. Of course, it is not up to us individually to change the system, but neither can we ignore our role in that change.

Applying the Theory of Deep Change provides an opportunity to understand and address the roots of these risks. The framework allows the current reality to be seen for what it is, that the dominant paradigms, including exceptionalism and consumerism, perpetuate risks that undermine our ability to create a sustainable and equitable future. By calling out these paradigms as the socially-constructed causes of risk, and by shifting these mindsets through inner levers – by valuing care, sufficiency, humility – and recognizing the interconnectivity of everything around us, we can create a new system that aligns with a desirable future. The outer levers of change, such as policy reforms and education, can reinforce these internal shifts.

However, the journey to a better future requires a willingness to imagine and work towards new possibilities based on collective action and innovation. Our current systems may resist transformation, but history has shown that even the most deep-rooted structures can be dismantled and rebuilt. We need more dreamers to create positive stories to better enable shared visions and expectations of a brighter future.

Ultimately, this report urges us to move beyond incremental changes and envision a world that is not just free from risks but also thriving. By redefining our beliefs and assumptions about the world, we can transform today's interconnected risks into opportunities for collective well-being and resilience.



A young woman wearing a traditional dress and jewelry. © Andy Coffie / Pexels

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