

From drifting to action

Key takeaways from the IPCC report on Impacts, adaptation and vulnerability

28 February 2022

“The cumulative scientific evidence is unequivocal: Climate change is a threat to human well-being and planetary health. Any further delay in concerted anticipatory global action on adaptation and mitigation will miss a brief and rapidly closing window of opportunity to secure a liveable and sustainable future for all. (very high confidence)” (IPCC SPM.D.5.3)

On 28 February a group of world’s leading climate scientists, convened by Intergovernmental Panel on Climate Change (IPCC), delivered their latest scientific assessment on climate change **impacts, adaptation and vulnerability** to governments. The Working Group II report paints a sobering picture of just how far into the climate crisis we have already plunged, and how much worse it could get, as warming interacts with many other global threats such as biodiversity loss, unsustainable consumption and social inequalities. Importantly, the report outlines the choices we have ahead in this critical decade. Below we summarise some of **our key takeaways** from the 3500 + page report, **with our own words**, followed by our conclusions for action. **In a nutshell:**

How’s it going?

- It’s bad. In fact, it wasn’t expected to be this bad yet, for ecosystems at least.
- Limits to cope are being crossed. Some irreversibly.
- We are not equally hit. But we are all hit.
- We’re still acting as if it’s not happening, which is making the situation worse.
- Adaptation to date is mostly too little too late. And even wrong.

What’s ahead?

- Risks are growing bigger faster than assessed before.
- Every bit of further warming is making the situation worse.
- If we cross 1.5°C, even temporarily, things will get much worse.

The change we need to achieve?

- Solutions exist for a safer future for all, but not without fast emission cuts.
- Techno-fixes alone won’t do the job. Need systems transformations, coupled with justice.
- Delivering on finance and equity will be key.
- Restoring and protecting our oceans, forests and species is needed to protect us.
- The window to act is rapidly closing. Defining years are at hand.

Greenpeace calls for action:

1. Exit fossil fuels, without any delay, and align climate targets with 1.5°C.
2. Protect at least 30 percent of the Earth by 2030.
3. Bridge the adaptation gap and address loss and damage.
4. Defend climate justice.
5. Fight for the future we deserve, meeting needs, not greeds.
6. Face the reality, with brutal honesty.

Below we elaborate more on these takeaways, drawing from the report’s Summary For Policymakers and the underlying chapters. **For the exact original IPCC wording and context, see the references in brackets.**¹

¹ SPM = Summary for Policymakers; TS = Technical Summary; Ch = Chapter

How's it going?

It's bad.

Human-induced climate change has caused widespread losses and damages to nature and people, despite adaptation efforts. Widespread, pervasive impacts to ecosystems, people, settlements, and infrastructure have resulted from observed increases in the frequency and intensity of climate and weather extremes, including hot extremes on land and in the ocean, heavy precipitation events, drought and fire weather. (SPM.B.1; SPM B.1.1)

The extent and magnitude of impacts to ecosystems are larger than estimated in previous assessments. Climate change has caused substantial damages, and increasingly irreversible losses, in terrestrial, freshwater and coastal and open ocean marine ecosystems. **About half of the species assessed globally are already on the move**, having shifted polewards or, on land, also to higher elevations. Hundreds of local losses of species have been driven by increases in the magnitude of heat extremes, and mass mortality events on land and in the ocean and loss of kelp forests.(SPM.B.1.2)

Roughly half of the world's population currently experience severe water scarcity for at least some part of the year due to climate change interacting with other drivers. **Increasing weather and climate extreme events have exposed millions of people into acute food insecurity and reduced water security**, particularly in Africa, Asia, Central and South America, and Small Islands and the Arctic. (SPM.B.1.3)

Climate and weather extremes are increasingly driving displacement in all regions, with small island states disproportionately affected. An average of over 20 million people have been internally displaced annually by weather-related extreme events since 2008, with storms and floods being the most common. (SPM.B.1.7; TS.B.6)

It wasn't expected to be this bad yet, for ecosystems at least.

Effects on ecosystems have been experienced earlier, are more widespread and with further-reaching consequences than anticipated. (TS.B.1)

Some extreme events have already emerged which exceeded projected global mean warming conditions for 2100, leading to abrupt changes in marine and terrestrial ecosystems. (TS.B.2.2)

Limits to cope are being crossed, some irreversibly.

Limits to adaptation are already being reached. The rise in weather and climate extremes has led to some irreversible impacts as natural and human systems are pushed beyond their ability to adapt. Ecosystems already reaching or surpassing hard adaptation limits - conditions that can't be adapted to - include some warm water coral reefs, some coastal wetlands, some rainforests, and some polar and mountain ecosystems. For human systems, conditions that can't be adapted to are reached primarily due to financial, governance, institutional and policy constraints. These are soft limits which can be overcome. (SPM.C.3.3; SPM.C.3)

Under all global warming levels, some regions that are presently densely populated will become unsafe or uninhabitable with movement from these regions occurring autonomously or through planned relocation. By 2100, compound and cascading risks will result in submergence of some low-lying islands states. (TS.C.7; TS.C.5.3)

We are not equally hit...

Mortality from floods, drought and storms was 15 times higher in highly vulnerable regions, compared to regions with very low vulnerability, in the past decade. (SPM.B.2.4)

Approximately 3.3 to 3.6 billion people live in contexts that are highly vulnerable to climate change. Global hotspots of high human vulnerability are found particularly in Central and South America, West-, Central- and East Africa, South Asia, Central and South America, Small Islands Developing States and the Arctic. (Section SPM.2)

Vulnerability of ecosystems and people to climate change differs substantially among and within regions, driven by patterns of intersecting socio-economic development, unsustainable ocean and land use, inequity, marginalization, historical and ongoing patterns of inequity such as colonialism, and governance. Societies with high levels of inequity are less resilient to climate change. (SPM.B.2.4; TS.B.7)

...but we are all hit.

Extreme climatic events have been observed in all inhabited regions, with many regions experiencing unprecedented consequences, particularly when multiple hazards occur in the same time or space. (TS.B.2.4)

Climate change has adversely affected physical and mental health of people in all assessed regions, and everywhere extreme heat events have resulted in human mortality and morbidity. The occurrence of climate-related diseases has increased, and animal and human diseases are emerging in new areas. Some mental health challenges are associated with warming temperatures, trauma from extreme weather and loss of livelihoods and culture. (SPM.B.1.4)

Biodiversity loss, and degradation, damages to and transformations of ecosystems are already key risks for every region and will continue to escalate with every increment of warming. (SPM.B.4.1)

Interconnectedness and globalization establish pathways for the transmission of climate-related risks across sectors and borders, through trade, finance, food, and ecosystems. (TS.C.11.6)

We're still acting as if it's not happening, which is making the situation worse.

Current planning and budgeting practices have given insufficient consideration to climate impacts and projected risks, placing more assets and people at risk. Since the previous assessment (AR5), the amount of people and key assets exposed to climate-induced impacts and loss and damages in cities, settlements and key infrastructure has increased. (TS.B.9.4; TS.B.8)

Sea-level rising at an accelerating rate will encroach on coastal settlements and infrastructure and commit low-lying coastal ecosystems to submergence and loss. If trends in urbanisation in exposed areas continue, this will exacerbate the impacts, with more challenges where energy, water and other services are constrained. The number of people at risk from climate change and biodiversity loss will increase. Globally, population change in low-lying cities and settlements will lead to approximately a billion people projected to be at risk from coastal-specific climate hazards in the mid-term under all scenarios. For some Small Islands and some low-lying coasts, sea-level rise poses an existential threat. (SPM.B.3.1; SPM.B.4.5)

Unsustainable agricultural expansion, driven in part by unbalanced, high-carbon diets, increases ecosystem and human vulnerability and leads to competition for land and/or water resources. (SPM.B.2.3)

Adaptation to date is mostly too little too late. And even wrong.

While adaptation actions have increased globally, generating multiple benefits, progress is unequally distributed, and the adaptation gap is set to grow. Most observed adaptation is fragmented, small in scale, incremental, sector-specific, designed to respond to current impacts and near-term risks, focused on planning rather than implementation. (Section SPM.C.1)

Evidence of maladaptation is increasing across many sectors and regions highlighting how inappropriate responses to climate change create long-term lock-in of vulnerability, exposure, and risks that are difficult and costly to change and exacerbate existing inequalities, impede

achievement of sustainable development goals and increase adaptation needs. For example, seawalls reduce impacts to people and assets in the short-term, but can result in lock-ins and increase exposure to climate risks in the long-term. Agricultural intensification addresses short-term food security and livelihood goals but has trade-offs in equity, biodiversity, and ecosystem services. (SPM.B.5; SPM.C.4.1; TS.D.5.5)

What's ahead?

Risks are growing bigger faster than previously assessed.

Since the previous IPCC assessment (AR5), climate risks are appearing faster and will get more severe sooner. Levels of risk for all Reasons for Concern (RFC)² are assessed to become high to very high at lower global warming levels than assessed before (in AR5). Two of these transitions to high to very high risk are associated with near-term warming: risks to unique and threatened systems at a median value of 1.5°C and risks associated with extreme weather events at median value of 2°C. Some key risks contributing to the RFCs are projected to lead to widespread, pervasive, and potentially irreversible impacts at warming of 1.5–2°C if exposure and vulnerability are high and adaptation is low. (TS-6; SPM.B.3.3)

Every bit of further warming is making the situation worse.

Climate change impacts and risks are becoming increasingly complex and more difficult to manage. Multiple climate hazards will occur simultaneously, and multiple climatic and non-climatic risks will interact, resulting in compounding overall risk and risks cascading across sectors and regions. (SPM.B.5)

Projected impacts, losses and damages escalate with every increment of warming, increasing adaptation limits in every region. Climate change and related extreme events will significantly increase ill health and premature deaths from the near- to long-term. Weather extremes, sea-level rise, adverse impacts on food security, water-related risks and related societal damages, and loss and damage to ecosystems are all projected to increase with every further fraction of a degree of warming. (Section B.4)

Unique and threatened ecosystems are expected to be at high risk already in the very near term at 1.2°C warming levels due to mass tree mortality, coral reef bleaching, large declines in sea-ice dependent species, and mass mortality events from heatwaves. **At 1.5°C warming, up to 14 % of species³ assessed in terrestrial ecosystems will likely face very high risk of extinction,** more than thousand times the natural background extinction rates, with risks increasing with higher warming. Very high extinction risk for endemic species in biodiversity hotspots is projected to increase at least tenfold if warming rises from 1.5°C to 3°C. **For the Amazon** the risk of a gradual transition from a tropical rainforest into savanna (savannization) starts turning high at a level between 1.5°C and 3°C with a median value at 2°C. At 2°C global warming with associated changes in precipitation are projected to increase global land **area burned by wildfire by 35%**. (TS.C.1.1; SPM.4.1; Ch16, 16.6.3.5; TS.C.1.1)

Above 1.5°C global warming, increasing concurrent climate extremes will increase risk of simultaneous crop losses of maize in major food-producing regions, with this risk increasing further with higher global warming levels. (SPM.B.5.1)

With about 1.8°C warming (RCP2.6 scenario) half of the human population could be exposed to periods of life-threatening climatic conditions arising from coupled impacts of extreme heat and humidity by 2100. A disproportionate level of exposure exists in subtropical cities subject to year-round warm temperatures and higher humidity, requiring less warming to exceed dangerous thresholds. (Ch6, Figure 6.3)

² The Reasons For Concern framework aggregates global risks to five categories as a function of global mean temperature change. Reasons For Concern are communicated with a “burning embers” graph, where colors in five pillars (RFCs) indicate the level of risk at a certain warming level, turning from white (undetectable) to yellow (moderate), to high (red), and to very high (purple).

³ Range 3-14 %.

If we cross 1.5°C, even temporarily, things will get much worse.

Near-term actions that limit global warming to close to 1.5°C would substantially reduce projected losses and damages in human systems and ecosystems, compared to higher warming levels, but cannot eliminate them all. (SPM.C.3)

Global warming, reaching 1.5°C warming in the near-term, would cause unavoidable increases in multiple climate hazards and will present multiple risks to ecosystems and humans. Climate resilient development prospects are increasingly limited if current emissions do not rapidly decline, especially if 1.5°C is exceeded in the near term. (SPM.B.3; SPM.D.5)

Exceeding 1.5°C temporarily, with the intention to return to below 1.5°C later in the century with large-scale carbon removal, would entail risks equivalent to the peak warming levels. Returning to 1.5°C would not undo the irreversible impacts triggered by then (such as species loss or ice sheet melt). (Section SPM.B.6)

The change we need to achieve

Solutions exist for a safer future for all, but not without fast emission cuts.

With proactive, timely, and effective adaptation, as part of climate resilient development, many risks for human health and wellbeing could be reduced and some potentially avoided. Reducing poverty, inequity, food and water insecurity, and strengthening institutions in particular reduces the risk of conflict and supports climate resilient peace. (TS.D.8)

Climate resilient development prospects are increasingly limited if current greenhouse gas emissions do not rapidly decline, especially if 1.5°C global warming is exceeded in the near term. (SPM.D.5)

Techno-fixes alone won't do the job. Need systemic changes, justice.

Adaptation strategies that treat climate, biodiversity and human society as parts of a system are the most effective. (Figure SPM.1)

Closing the adaptation gap requires moving beyond short-term planning. Inclusive governance that prioritises equity and justice in adaptation planning and implementation leads to more effective and sustainable adaptation outcomes. Vulnerabilities and climate risks are often reduced through carefully designed and implemented laws, policies, processes, and interventions that address context specific inequities such as based on gender, ethnicity, disability, age, location and income. (TS.D.1.7 SPM.C.5.6)

A deliberate shift from primarily technological adaptation strategies to those that additionally incorporate behavioral and institutional changes, adaptation finance, equity and environmental justice, and that align policy with global sustainability goals, will facilitate transformational adaptation. For a just, climate-resilient development, multiple systems transitions are needed (societal, energy, land and ocean ecosystem, urban and infrastructure, and industrial). Effective Ecosystem-based Adaptation, such as urban greening, and protection and restoration of natural river systems, wetlands and upstream forest ecosystems, or marine protected areas reduces a range of climate change risks to people, biodiversity and ecosystem services with multiple co-benefits. (TS.E.6.1; TS.D.11; SPM.D; SPM.C.2.5; FAQ 3.5)

Most innovation in adaptation in cities and settlements has occurred through advances in social and ecological infrastructures including disaster risk management, social safety nets and green/blue infrastructure. However, more financing is directed at physical infrastructure than natural and social infrastructure, and there is limited evidence of investment in the informal settlements hosting the most vulnerable urban residents.. (TS.D.1.4; SPM.C.2.7)

Some suggested responses generate new risks. For example, deployment of afforestation of naturally unforested land, or poorly implemented bioenergy, with or without carbon capture and

storage, can compound climate-related risks to biodiversity, water and food security, and livelihoods, especially if implemented at large scales, especially in regions with insecure land tenure. Solar radiation modification approaches, if they were to be implemented, introduce a widespread range of new risks to people and ecosystems, which are not well understood. (SPM.B.5.4; SPM.B.5.5)

To close the adaptation gap, political commitment, persistence and consistent action across scales of government, and upfront mobilisation of human and financial capital is key, even when the benefits are not immediately visible. Political commitment and follow-through across all levels of government accelerate the implementation of adaptation actions. This is promoted by rising public awareness, building business cases, accountability and transparency mechanisms, monitoring of adaptation progress, **social movements and climate-related litigation** in some regions. (SPM.C.5.1)

Local leadership especially amongst women and youth can advance equity within and between generations. Since AR5, social movements including movements led by youth, indigenous and ethnic communities have heightened public awareness about the need for urgent, inclusive action to achieve adaptation that can also enhance wellbeing and advance climate justice. (TS.D.9.7)

Delivering on finance and equity will be key.

Opportunities for climate resilient development are not equitably distributed around the world. Climate impacts and risks exacerbate vulnerability and social and economic inequities, which in turn undermines efforts to achieve sustainable development. Climate resilient development is facilitated by international cooperation and by governments at all levels working inclusively with all stakeholders. (SPM.D.1.2; SPM.D.2)

With adaptation finance needs estimated to be higher than those presented in the AR5, enhanced mobilisation and access to financial resources are essential for implementation of adaptation and to reduce adaptation gaps. (SPM.C.5.4)

Losses and damages are unequally distributed across systems, regions and sectors and are not comprehensively addressed by current financial, governance and institutional arrangements, particularly in vulnerable developing countries. With increasing global warming, losses and damages increase and become increasingly difficult to avoid, while strongly concentrated among the poorest vulnerable populations. (SPM.C.3.5)

Restoring and protecting oceans, forests and species will protect us

Safeguarding biodiversity and ecosystems is fundamental to climate resilient development. Diverse, self-sustaining ecosystems with healthy biodiversity provide multiple essential contributions for adaptation and mitigation, thereby reducing risk and increasing societal resilience to future climate change. (SPM.D; TS.D.4)

Projected climate change, combined with non-climatic drivers, will cause loss and degradation of much of the world's forests (high confidence), coral reefs and low-lying coastal wetlands. (SPM.B.2.3)

Unsustainable land-use and land cover change, unsustainable use of natural resources, deforestation, loss of biodiversity, pollution, and their interactions, adversely affect the capacities of ecosystems, societies, communities and individuals to adapt to climate change. Loss of ecosystems and their services has cascading and long-term impacts on people, including for Indigenous Peoples and local communities who are directly dependent on ecosystems to meet basic needs. Due to deforestation and forest degradation, primary tropical forests currently emit more carbon to the atmosphere than they remove. (SPM.B.2.1; Ch2, Table 2.5)

Space for nature is shrinking as large areas of forest are lost to deforestation, peat draining and agricultural expansion, land reclamation and protection structures in urban and coastal settlements. Globally, less than 15% of the land, 21% of the freshwater and 8% of the ocean are protected, mostly with insufficient stewardship to prevent damage or increase resilience against climate change. (SPM.B.2.2)

Maintaining the resilience of biodiversity and ecosystem services at a global scale depends on effective and equitable conservation of approximately 30 % to 50 % of Earth's land, freshwater and ocean areas, including currently near-natural ecosystems. Restoring natural forests and drained peatlands and improving sustainability of managed forests, generally enhances the resilience of carbon stocks and sinks.. Cooperation, and inclusive decision making, with Indigenous Peoples and local communities and recognition of their rights is integral to successful adaptation in many areas. (SPM.D.4; SPM.C.2.3)

Marine nature-based solutions like marine protected areas, habitat restoration and sustainable fisheries are cost-effective and provide myriad benefits to society. While marine protected areas do not prevent extreme events like marine heatwaves, they can provide marine plants and animals with a better chance to adapt to a changing climate. (Ch 3, FAQ3.5)

The window is rapidly closing. Defining years are at hand.

Beyond 2040 and depending on the degree of warming, climate change will lead to numerous risks to natural and human systems. For 127 identified key risks, assessed mid- and long-term impacts are up to multiple times higher than currently observed. The magnitude and rate of climate change and associated risks depend strongly on near-term mitigation and adaptation actions. (SPM.B.4)

There is a rapidly narrowing window of opportunity to enable climate resilient development, with pathways progressively constrained by every increment of warming, in particular beyond 1.5°C. Societal choices implemented in the next decade will be decisive. (SPM.D.1.1; SPM.D.5; Figure SPM.7)

Greenpeace conclusions for action

1. Exit fossil fuels. Without any delay. Align targets with 1.5°C.

To limit further impacts, hazards and irreversible losses, there can be no investment in new fossil fuel supply projects, and no further final investment decisions for new unabated coal plants. That is what even the International Energy Agency [finds](#) is needed to limit warming to 1.5°C. Coal - the most carbon-polluting fossil fuel - needs to go in rich countries by 2030 the latest, and globally by 2040.

Current policies and plans must be urgently revised, as governments still plan to produce more than double the amount of fossil fuels in 2030 than what would be consistent with limiting global warming to 1.5°C, according to the [UNEP et al Production Gap Report](#).

The massive subsidies to fossil fuels, amounting to \$ 5.9 trillion a year, or 6.8 percent of GDP, must be ceased. The fossil fuel phase out plans must include and support workers and affected communities and deliver a just transition to energy independence and a better economic future and jobs. It's time to invest in the future and stop bailing out a dying industry.

2. Protect at least 30 percent of Earth by 2030.

Governments must recognise the urgency of the interconnected biodiversity and climate crises and commit to protecting at least 30% of terrestrial and marine areas by 2030. They need to adopt global biodiversity targets, 30 % by 2030, at the [Biodiversity Summit \(CBD\)](#) COP15 later this year.

Millions of people globally want action to tackle the ocean crisis, and more than 100 governments have pledged support for ocean protection. **In March this year, governments must agree to a strong [Global Ocean Treaty](#)** at the United Nations that enables the creation of such protected areas in the global oceans, and fills the glaring governance gap of tackling climate emergency on the ocean.

Any discussions and actions regarding the 30x30 goals must recognise and strengthen the rights of Indigenous Peoples and local communities to their lands or waters, including their right to informed consent. Their identities, cultures, spirituality, and lifeways are inextricably linked to biodiversity, and expanding recognition of Indigenous and local land rights is essential to protecting our natural world.

3. Bridge the adaptation gap and address loss and damage

Governments must respond to the unequivocal evidence of growing climate injustice and inequality, and protect people in vulnerable conditions. The growing gap on adaptation and on losses and damages is inextricably linked with deep injustices, lack of finance and outdated development pathways. This is something governments will be inescapably confronted with at all levels. At the COP 27 in Egypt this year, governments must address this emergency with the seriousness it deserves.

4. Defend climate justice.

People have rights. Governments have obligations. Let's make them accountable.

The era where the fossil fuel industry and its backers can get away with and profit from their toxic practices is ending. People are holding polluting corporations and governments to account and forcing the change we need to prevent further harm. Governments and corporations have no choice but to act in line with science to meet their human rights obligations as communities made vulnerable by climate change will continue to vindicate their human rights and demand justice.

In the last year alone, an unprecedented number of key decisions with far-reaching impacts were issued. Just like the cascading impacts of climate, all of these climate cases are connected and reinforce a global standard that climate protection is a human right. Join the rapidly growing global movement and [raise your voice!](#)

5. Fight for the future we deserve, meeting needs, not greeds.

The development model based on infinite growth and extraction is unjust and obsolete. It needs to go. We deserve a future that respects people and the limits and cycles of the earth. We deserve a future where there is no power of economic gains over life; one connected with nature, rooted in a diversity of communities where decisions are made inclusively and equality is assured. A future based on solidarity and cooperation, where progress is measured in collective wellbeing from the local to the global level. Away from profit maximization in the short term and individual value claiming over the limits of nature and the rights of people. A fight against overconsumption and overexploitation that depletes the ability of the Earth to regenerate, freshen the air, filter rivers, pack glaciers, regreen forests and fields, fertilize oceans to create a bountiful and lush environment safe from extreme weather events where life can thrive.

6. Face the reality, with brutal honesty.

To fix a problem, we need to first face the full scale of it, with brutal honesty. Currently governments are neither preparing for the 1.5°C world we should be heading, nor for the 2.7°C world where we're sliding into. We are just drifting. Completely unprepared for the complex hazards ahead.

Let's take control of our future. Together. This is the moment to rise up, be bold and think big. And there's a role to play for everyone.

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