Key findings from the Sixth Assessment Report of the Intergovernmental Panel on Climate Change

Road to COP27

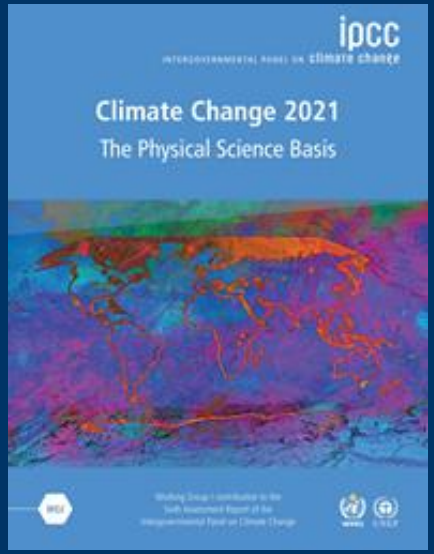
Abdallah Mokssit, Secretary of the IPCC

Cairo, Egypt
18 October 2022

UNFCCC & IPCC over the years

from Berlin (COP1) to Sharm El Sheikh (COP27) and beyond

Working Group I Report - August 2021



> Recent changes in the climate are widespread, rapid, and intensifying, and unprecedented in thousands of years.

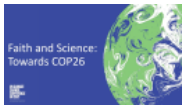
Climate change is already affecting every region on our planet.

WGI

2021

COP26 – Glasgow – November 2021

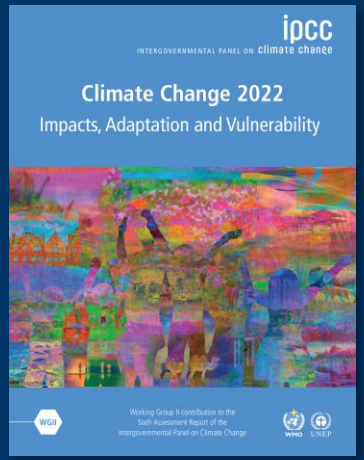
- IPCC presented the Working Group I report
- Glasgow Climate Pact
  - Welcomed the IPCC Working Group I report and
  - invited the IPCC to present its forthcoming reports to the SB meetings and COP in 2022



WGI COP26

2021 2022

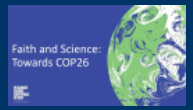
Working Group II Report - February 2022



“

The scientific evidence is unequivocal: climate change is a threat to human well-being and the health of the planet.

Any further delay in concerted global action will miss the brief, rapidly closing window to secure a liveable future.



WGI COP26 WGII

2021 2022

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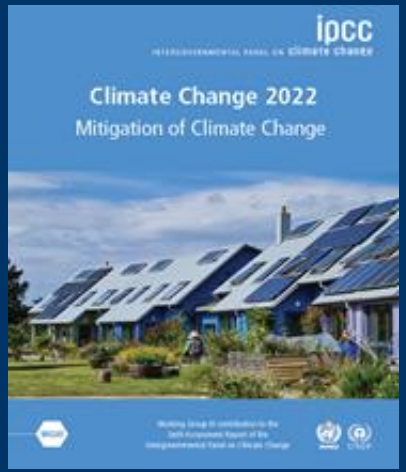
Working Group III Report - April 2022



WGI COP26 WGII WGIII

2021 2022

"The time for action is now.

Unless there are immediate and deep emissions reductions across all sectors, 1.5°C is beyond reach.

Climate action is being taken in many countries. There are policies, regulations and market instruments that are proving effective.

We have options in all sectors to at least halve emissions by 2030.

SB56 – Bonn - June 2022

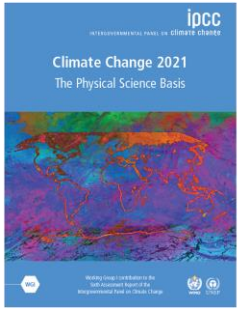
IPCC was invited to:

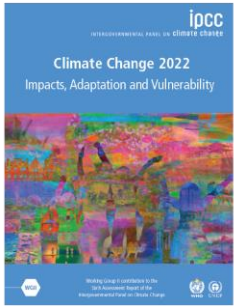
- Deliver statement at the opening of the joint SBSTA/SBI session
- Organize SBSTA-IPCC special event on Working Group II
- Organize SBSTA-IPCC special event on Working Group III
- Take part in the Global Goal on Adaptation event
- Participate in the Structured Expert Dialogue & the Research Dialogue
- Deliver statement of the opening of the first Technical Dialogue on the Global Stocktake and participate in subsequent meetings
- Hold a TFI/UNFCCC event on The Next Generation of the IPCC Inventory Software

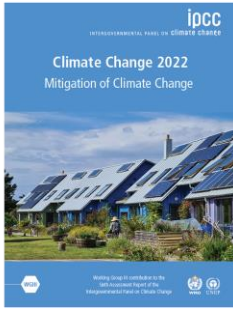
- IPCC is bringing **two new major** reports on Adaptation and Mitigation directly contributing to the **4 COP27 goals** including also information on Finance and Collaboration.
- IPCC is working closely with UNFCCC and the Egyptian Presidency on all relevant invitations and requests **for participation in COP27** relevant events.
- IPCC will run a joint **pavilion with WMO.** The rich programme of scientific events will reflect the priority COP27 topics, thus serving as a **toolbox for policymakers**.

From the Sixth Assessment cycle Reports

- Climate change is widespread, rapid, and intensifying. It is unprecedented in thousands of years
- Increase in extreme events – more frequent and intense extreme heat and heavy rainfall events; increased droughts in some regions.
- The scientific evidence is unequivocal: climate change is a threat to human well-being and the health of the planet.
- Any further delay in concerted global action will miss the brief, rapidly closing window to secure a livable future.
- The evidence is clear: the time for climate action is now.







THE SCIENCE IS CLEAR

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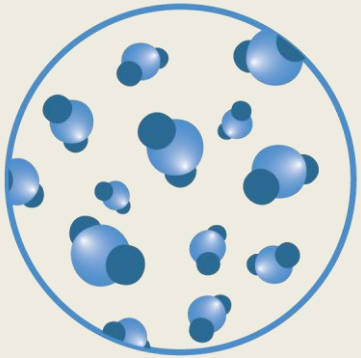
CO_2
concentration



Highest

in at least

2 million years

Sea level
rise

Fastest rates

in at least

3000 years

Arctic sea ice
area

Lowest level

in at least

1000 years

Glaciers
retreat

Unprecedented

in at least

2000 years

THE SCIENCE IS CLEAR

Extreme heat

More frequent

More intense

Heavy rainfall

More frequent

More intense

Drought

Increase in some regions

Fire weather

More frequent

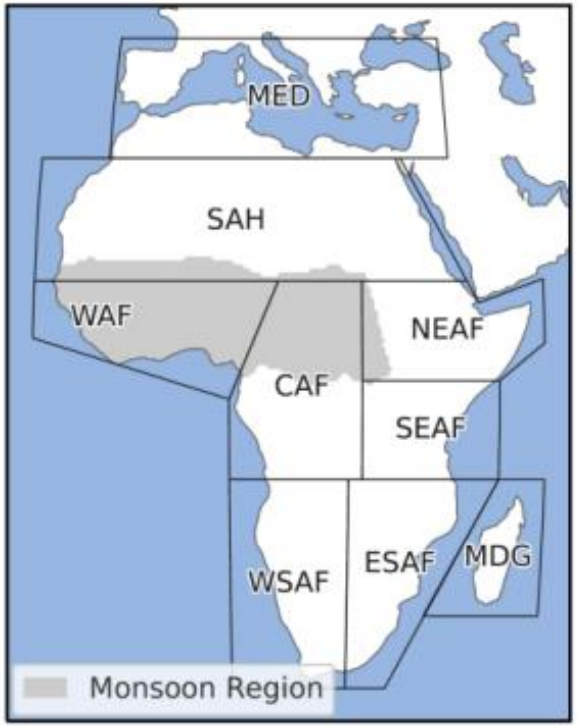
Ocean

Warming

Acidifying

Losing oxygen

Photo Credits from left: 1. Luiz Guimaraes 2. Jonathan Ford 3. Peter Burdon 4. Ben Kuo 5. NOAA



Sahara including parts of the Sahel (SAH)

- Projected increases in heavy precipitation and pluvial flooding.

West Africa (WAF)

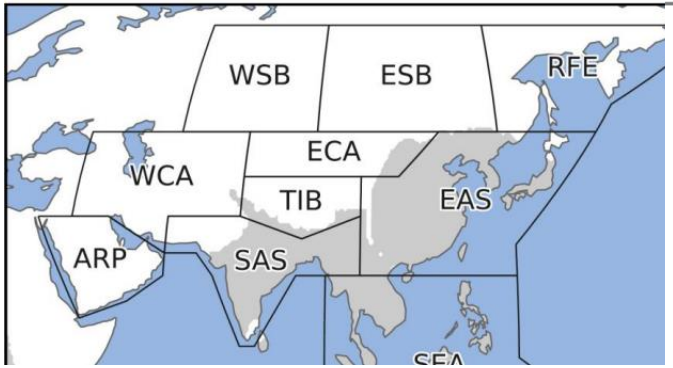
- Observed increase in river flooding;
- Observed increase in drying and agricultural and ecological droughts;
- Projected increase in meteorological droughts at GWL 4°, mostly in seasonal timescales;
- Projected increases in mean wind speed; increase in heavy precipitation and pluvial flooding.

North Eastern Africa (NEAF)

- Observed decreases in mean precipitation;
- Observed and projected decreases in snow and glaciers;
- Projected increases in heavy precipitation and pluvial flooding;
- Projected decrease in meteorological drought at 4°C global warming.

Mediterranean (North Africa)

- Projected decreases in mean precipitation, increases in fire weather conditions and decreases in mean wind speed;
- Observed and projected increases in aridity, meteorological, hydrological and agricultural and ecological droughts.



Southwest Asia (WCA, ARP)

- Anthropogenic warming has amplified droughts since the 1980s (*high confidence*). An increase in extreme precipitation has been observed, mostly in elevated areas.
- Mountain permafrost degradation at high altitudes has increased the instability of mountain slopes in the past decade (*medium confidence*). Reduction of the annual maximum amount of snow increases with elevation in mountain areas.
- Annual precipitation totals, intensity, and frequency of heavy precipitation are projected to increase with increasing warming levels. Strong spatiotemporal differences with overall decreasing precipitation are projected in summer with the opposite tendency in winter.

Future global climate risks

Heat stress

Exposure to heat waves will continue to increase with additional warming.

Water scarcity

At 2°C, regions relying on snowmelt could experience 20% decline in water availability for agriculture after 2050.

Food security

Climate change will increasingly undermine food security.

Flood risk

About a billion people in low-lying cities by the sea and on Small Islands at risk from sea level rise by mid-century.

SUDAN

DESERTIFICATION

- Drought (frequent, prolonged, intense)
  - Caused and/or exacerbated by climate change
  - Droughts are hotter and thus more severe
- Human activities (exacerbated by drought)
  - Wood harvesting
  - Overgrazing, trampling, soil compaction
- Erosion from wind and water
  - Loss of soil fertility, lower water retention

- Data gaps
  - Extent of degraded land, vegetation maps

THE HORN OF AFRICA IS GETTING EVEN DRIER

PROLONGED DROUGHT & OVERGRAZING

OASES

- Already
  - Water resources declining
  - Suitability for crops decreasing
  - Oases abandoned
- Future
  - Water demand exceeds supply
  - Too hot and dry for traditional crops

Water security impacts

More variable rainfall and river discharge

Negative and cascading impacts on multiple sectors, including hydropower generation.

Photos: 1. Jeff Ackley 2. Denis Onyodi

Water management

Options on farms:

- Irrigation
- Rainwater storage, water-saving tech
- Moisture conservation in soils

Economic and ecological benefits; reduced vulnerability

Wider options:

- Securing drinking water
- Flood and drought risk management
- Working with nature, land-use planning

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…Climate change is affecting the lives of billions of people, despite efforts to adapt.

Impacts are magnified in cities where more than half the world's population lives.

[Peter Nguyen / Unsplash]

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There are options we can take
to reduce the risks to people and nature.

[Il Vagabiondo / Unsplash]

Improving food security

Effective options:

- Cultivar improvements
- Agroforestry
- Farm and landscape diversification
- Community-based adaptation
- Strengthening biodiversity

Wider benefits:

- Food security and nutrition
- Health and well-being
- Livelihoods

[Jacquelyn Turner / CCAFS CC BY-NC-SA 2.0; FAO / Riccardo De Luca]

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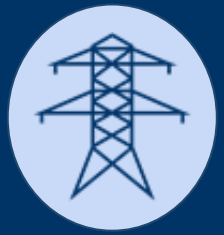
There are options available **now** in every sector that can at least **halve** emissions by 2030

Demand and services



Energy

Land use

Industry

Urban

Buildings

Transport

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Transforming cities

By 2050 urban areas could be home to two-thirds of the world's population.

Effective options

- Nature-based and engineering approaches together
- Establishing green and blue spaces
- Urban agriculture
- Social-safety nets for disaster management

Wider benefits

- Public health improvements
- Ecosystem conservation

There are limits to adaptation

- Even effective adaptation cannot prevent all losses and damages
- Above 1.5°C some natural solutions may no longer work.
- Above 1.5°C, lack of fresh water could mean that people living on small islands and those dependent on glaciers and snowmelt can no longer adapt.
- By 2°C it will be challenging to farm multiple staple crops in many current growing areas.

Energy

- **major transitions** are required to limit global warming
- reduction in fossil fuel use and use of carbon capture and storage
- low- or **no-carbon** energy systems
- widespread **electrification** and improved energy **efficiency**
- **alternative fuels**: e.g. hydrogen and sustainable biofuels

Industry

- using materials more **efficiently**, **reusing**, **recycling**, **minimising waste**; currently **under-used** in policies and practice
- **basic materials**: low- to zero-greenhouse gas production processes at **pilot** to **near-commercial** stage
- achieving **net zero** is challenging





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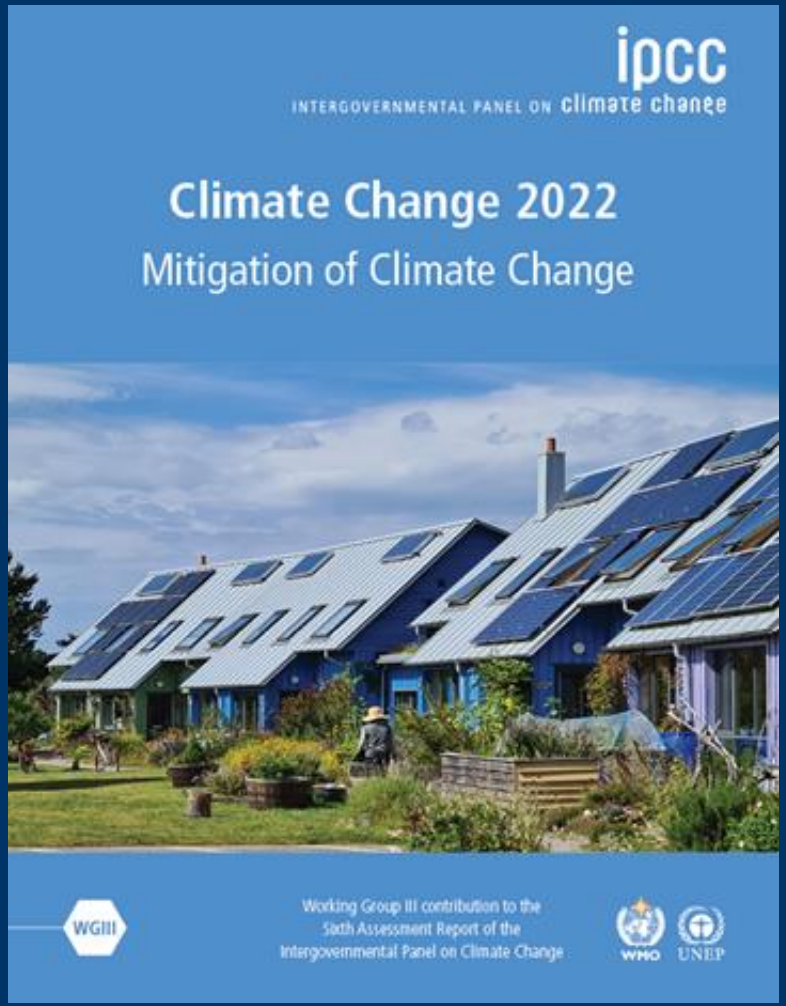
Land use

- can provide large-scale emissions reductions **and** remove and store CO_2 at scale
- protecting and restoring **natural ecosystems** to remove carbon: forests, peatlands, coastal wetlands, savannas and grasslands
- competing demands have to be **carefully managed**
- **cannot compensate** for **delayed** emission **reductions** in other sectors

Sixth Assessment Report
WORKING GROUP III – MITIGATION OF CLIMATE CHANGE

“The evidence is clear:
The time for action is now



[Matt Bridgestock, Director and Architect at John Gilbert Architects]

THANK YOU
FOR YOUR ATTENTION

Abdallah Mokssit
Secretary of the IPCC

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