

#### **2007 Nobel Peace Prize**

The Intergovernmental Panel on Climate Change and Albert Arnold (Al) Gore Jr. were awarded the Nobel Peace Prize

"...for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change."







https://www.ipcc.ch/

# Climate Change 2023: Synthesis Report of the IPCC AR6 Adaptation Challenges and Opportunities

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http://ancst.org

#### THE ROLE OF THE IPCC IS...

"... to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation."

"IPCC reports should be neutral with respect to policy, although they may need to deal objectively with scientific, technical and socio-economic factors relevant to the application of particular policies."



















#### Adverse impacts from human-caused climate change will continue to intensify

#### a) Observed widespread and substantial impacts and related losses and damages attributed to climate change

Water availability and food production



Physical

water

Agriculture/

availability production





productivity



production





diseases

Health and well-being





Animal and Fisheries livestock vields and health and

Heat, malnutrition and harm from wildfire

Mental health

Displacement

Cities, settlements and infrastructure



Inland flooding and associated damages coastal areas



induced damages in structure



**Damages** to key economic sectors



Terrestrial





ecosystems

Freshwater Ocean ecosystems ecosystems

Includes changes in ecosystem structure, species ranges and seasonal timing

#### Key

Observed increase in climate impacts to human systems and ecosystems assessed at global level



Adverse impacts



Adverse and positive impacts



Climate-driven changes observed, no global assessment of impact direction

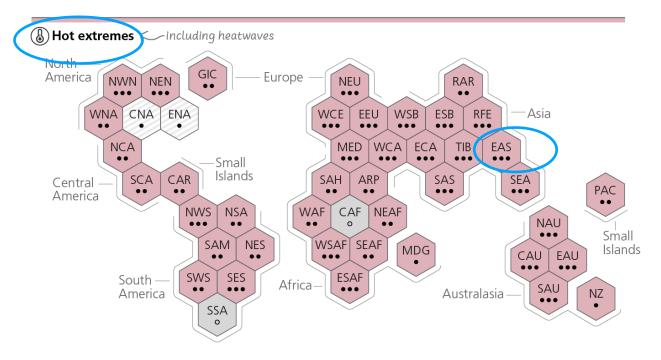
#### **Confidence** in attribution to climate change

- ••• High or very high confidence
- •• Medium confidence
- Low confidence

Source: IPCC AR6 Figure SPM.1 (a), 2023

## Climate change has impacted human and natural systems across the world with those who have generally least contributed to climate change being most vulnerable

a) Synthesis of assessment of observed change in hot extremes, heavy precipitation and drought, and confidence in human contribution to the observed changes in the world's regions



Type of observed change since the 1950s

Increase

Decrease

Limited data and/or literature

Low agreement in the type of change

Confidence in human contribution
to the observed change

••• High

•• Medium

• Low due to limited agreement

• Low due to limited evidence

Each hexagon corresponds
to a region

NWN

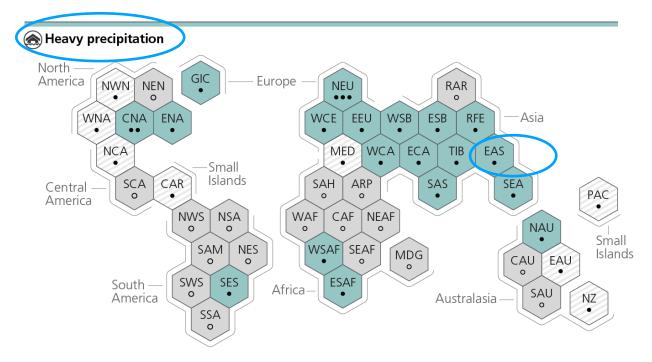
North-Western
North America

IPCC AR6 WGI reference regions: North America: NWN (North-Western North America, NEN (North-Eastern North America), WNA (Western North America), CNA (Central North America), ENA (Eastern North America), Central America: NCA (Northern Central America), SCA (Southern Central America), CAR (Caribbean), South America: NWS (North-Western South America), NSA (Northern South America), NES (North-Eastern South America), SAM (South American Monsoon), SWS (South-Western South America). SES (South-Eastern South America), SSA (Southern South America), Europe: GIC (Greenland/Iceland), NEU (Northern Europe) WCE (Western and Central Europe), EEU (Eastern Europe). MED (Mediterranean). Africa: MED (Mediterranean), SAH (Sahara), WAF (Western Africa), CAF (Central Africa), NEAF (North Eastern Africa), SEAF (South Eastern Africa). WSAF (West Southern Africa), ESAF (East Southern Africa), MDG (Madagascar), Asia: RAR (Russian Arctic), WSB (West Siberia), ESB (East Siberia), RFE (Russian Far East), WCA (West Central Asia). ECA (East Central Asia), TIB (Tibetan Plateau), EAS (East Asia), ARP (Arabian Peninsula), SAS (South Asia), SEA (South East Asia). Australasia: NAU (Northern Australia). CAU (Central Australia), EAU (Eastern Australia), SAU (Southern Australia), NZ (New Zealand). Small Islands: CAR (Caribbean), PAC (Pacific Small Islands)

Source: IPCC AR6 Figure 2.3 (a), 2023

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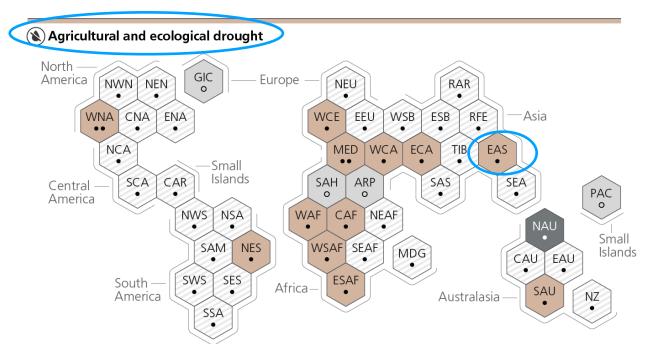
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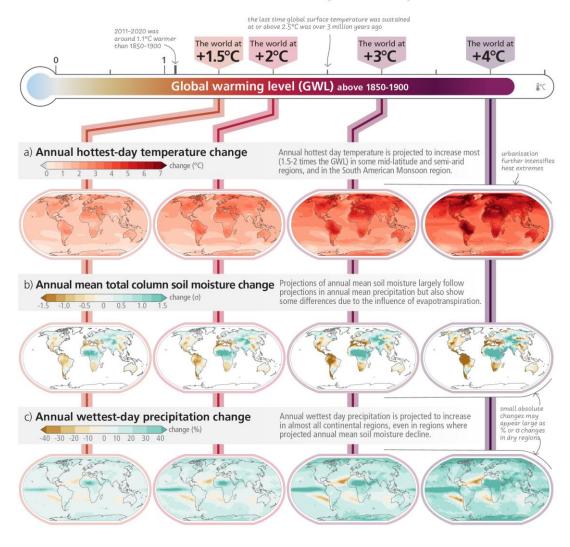
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Source: IPCC AR6 Figure 2.3 (a), 2023

## With every increment of global warming, regional changes in mean climate and extremes become more widespread and pronounced IPCC AR6 Figure SPM.2 Sixth Assessment Report | Synthesis Report

#### With every increment of global warming, regional changes in mean climate and extremes become more widespread and pronounced





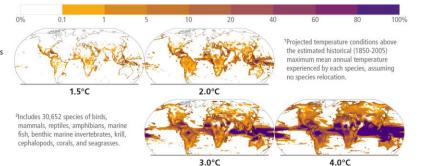
## Future climate change is projected to increase the severity of impacts across natural and human systems and will increase regional differences IPCC AR6 Figure SPM.3 Sixth Assessment Report | Synthesis Report

#### Future climate change is projected to increase the severity of impacts across natural and human systems and will increase regional differences

Examples of impacts without additional adaptation

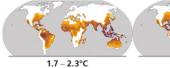


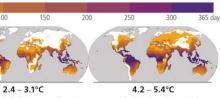
Percentage of animal species and seagrasses exposed to potentially dangerous temperature conditions1,2



#### b) **Heat-humidity** risks to human health





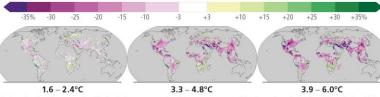


Days per year where combined temperature and of mortality to individuals3

<sup>3</sup>Projected regional impacts utilize a global threshold beyond which daily mean surface air temperature and relative humidity may induce hyperthermia that poses a risk of mortality. The duration and intensity of heatwaves are not presented here. Heat-related health outcomes humidity conditions pose a risk vary by location and are highly moderated by socio-economic, occupational and other non-climatic determinants of individual health and socio-economic vulnerability. The threshold used in these maps is based on a single study that synthesized data from 783 cases to determine the relationship between heat-humidity conditions and mortality drawn largely from observations in temperate climates.

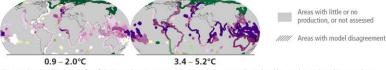
#### c) Food production impacts





4Projected regional impacts reflect biophysical responses to changing temperature, precipitation, solar radiation, humidity, wind, and CO2 enhancement of growth and water retention in currently cultivated areas. Models assume that irrigated areas are not water-limited. Models do not represent pests, diseases, future agro-technological changes and some extreme climate responses,

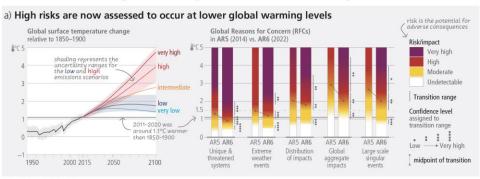


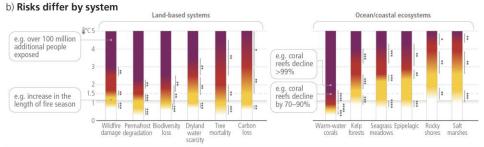


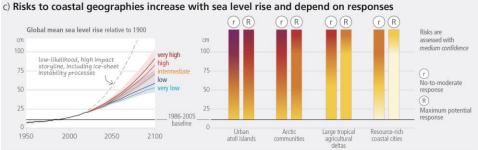
<sup>5</sup>Projected regional impacts reflect fisheries and marine ecosystem responses to ocean physical and biogeochemical conditions such as temperature, oxygen level and net primary production. Models do not represent changes in fishing activities and some extreme climatic conditions. Projected changes in thea Arctic regions have low confidence due to uncertainties associated with modelling multiple interacting drivers and ecosystem responses.

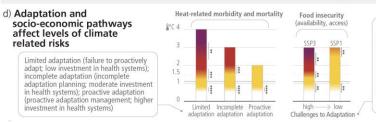
# Risks are increasing with every increment of warming IPCC AR6 Figure SPM.4 Sixth Assessment Report | Synthesis Report

#### Risks are increasing with every increment of warming







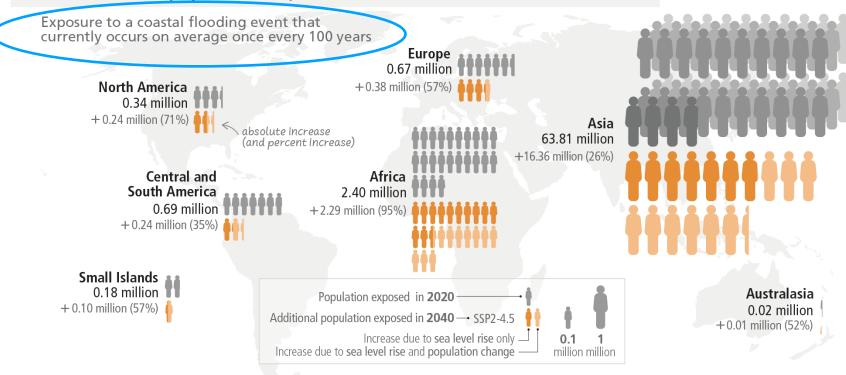


The SSP1 pathway illustrates a world with low population growth, high income, and reduced inequalities, food produced in low GHG emission systems, effective land use regulation and high adaptive capacity (i.e., low challenges to adaptation). The SSP3 pathway has the opposite trends.



## Every Region faces more severe and/or frequent compound and cascading climate risks

a) Increase in the population exposed to sea level rise from 2020 to 2040



Source: IPCC AR6 Figure 4.3 (a), 2023

## Every Region faces more severe and/or frequent compound and cascading climate risks

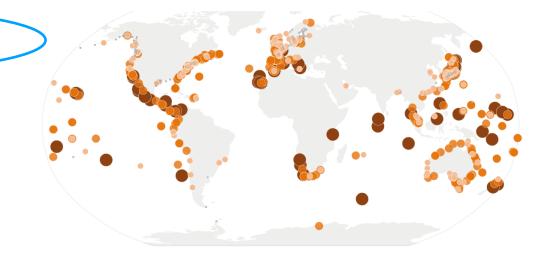
b) Increased frequency of extreme sea level events by 2040

Frequency of events that currently occur on average once every 100 years

The absence of a circle indicates an inability to perform an assessment due to a lack of data.

Projected change to 1-in-100 year events under the intermediate SSP2-4.5 scenario

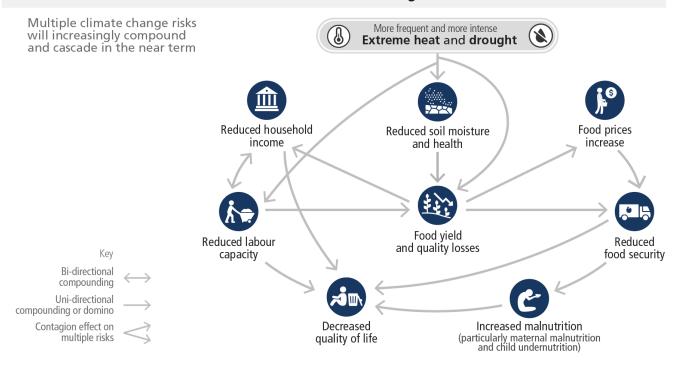




Source: IPCC AR6 Figure 4.3 (b), 2023

## Every Region faces more severe and/or frequent compound and cascading climate risks

c) Example of complex risk, where impacts from climate extreme events have cascading effects on food, nutrition, livelihoods and well-being of smallholder farmers



Source: IPCC AR6 Figure 4.3 (c), 2023

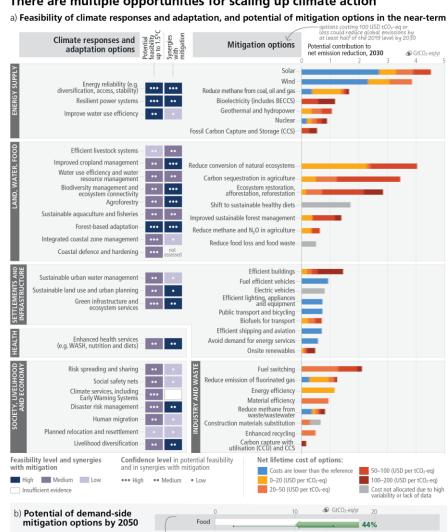
Limiting warming to 1.5°C and 2°C involves rapid, deep, and in most cases immediate greenhouse gas emission reductions

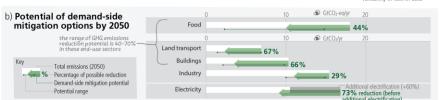
IPCC AR6 Figure SPM.5

There are multiple opportunities for scaling up climate action

IPCC AR6 Figure SPM.7

#### There are multiple opportunities for scaling up climate action

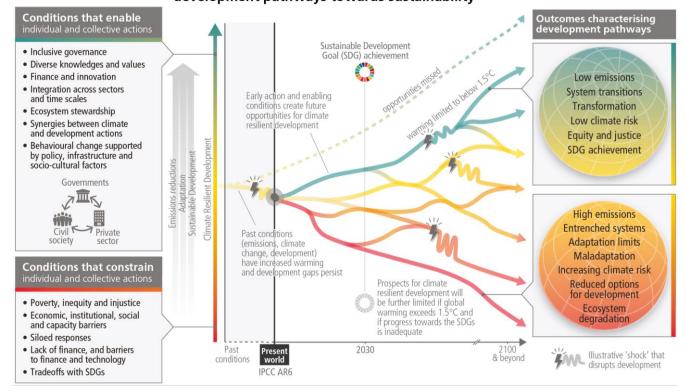






## There is a rapidly narrowing window of opportunity to enable climate resilient development

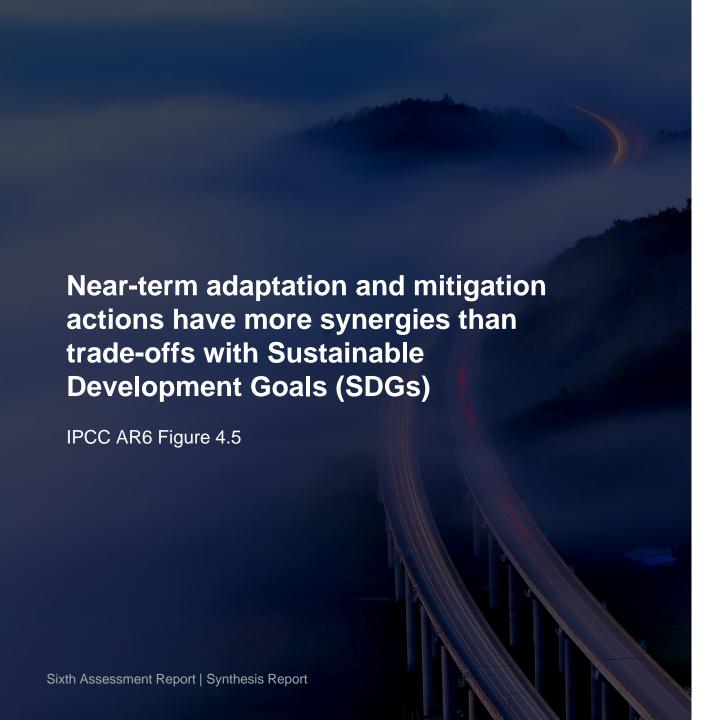
Multiple interacting choices and actions can shift development pathways towards sustainability



#### **Climate Resilient Development:**

The process of <u>implementing</u> <u>mitigation and adaptation</u> together in support of sustainable development for all (AR6 WG II)

Source: IPCC AR6 Figure SPM. 6, 2023



#### Near-term adaptation and mitigation actions have more synergies than trade-offs with Sustainable Development Goals (SDGs)

Synergies and trade-offs depend on context and scale

SDGs	Energy systems		Urban and infrastructure		Land system		Ocean ecosystems	Society, livelihoods, and economies	Industry
	Mitigation	Adaptation	Mitigation	Adaptation	Mitigation	Adaptation	Adaptation	Adaptation	Mitigation
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2 7000 1136237								8	
3 COORDINATE STREET								8	N N
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12 RESPONSELL CONSUMPTION AND PROCESCES					3				
14 and water					8				
15 on the contract of the cont			N		8				
16 PENCE, RESTER AND STREETINGS INSTITUTIONS									
17 Participant									
			Key Synergi	es Trade-of	fs Both syn	ergies and trade-offs/	mixed Lim	ited evidence/no evide	nce/no assessment



### **Concluding Remarks**

- ☐ IPCC advocates science and does not participate in political negotiations.
- □ Climate change is a threat to human well-being and planetary health. Transformative actions at an unprecedented scale is required to <u>limit global warming to 1.5°C</u>.
- These include <u>deep emissions cuts for GHG emissions to peak by 2025 and reduced by 43% by 2030</u> in all sectors, deployment of a range of technologies, behavioral changes as well as increased investment in low carbon options.
- ☐ There is a rapidly narrowing window of opportunity to enable <u>climate resilient</u> <u>development</u>.
- ☐ There are multiple opportunities for scaling up climate action, with higher mitigation investment flows required for all sectors and regions to limit global warming.

The science is clear

The time for action is now

Our world needs climate action on all fronts – everything, everywhere, all at once,"

**UN Secretary-General António Guterres** 

Thank you very much!