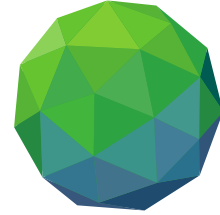


GCF Climate Information and Early Warning Systems Sector Guide



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Why invest in CIEWS? (I)



- Disasters worldwide 1970–2019:
 - 79% hydromet hazards
 - 56% of deaths and 75% of economic losses (>\$2.4 trillion annually or 0.2% of world GDP)
 - 1.4 million deaths in LDCs
- Disasters increasing as climate change gathers pace
- Significant risk to the Paris Agreement and SDGs
- Desired transformation:
 - investments for both adaptation and mitigation
 - reliable Climate Information Services and Impact-Based Multi Hazard Early Warning Systems to support well-informed, science-based decision-making



Why invest in CIEWS? (II)



- 2019 NDCs show a significant demand for CIEWS: Request for hydromet modernisation from
 - 96% of countries in Africa
 - 83% in Asia
 - 82% in South America
 - 79% hydromet hazards
- WMO CIEWS assessments:
 - 49% of countries have fully established CIS user interfaces
 - 52% of countries in Africa, 21% in Asia, 42% in South America, 14% of South West Pacific, 16% of SIDS and 49% of LDCs have no fit-for-purpose MHEWS

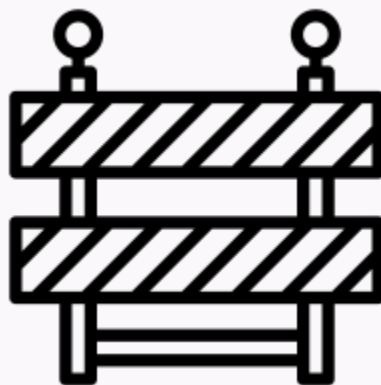
BARRIERS AND OPPORTUNITY FOR GCF'S IMPACT



Lack of enabling environment for **institutional effectiveness**



Lack of coverage and scale for effective service delivery in terms of quantity and quality of **hard infrastructure** and inadequate **soft infrastructure** for ensuring delivery and uptake of information.



Uncoordinated interventions limit the effectiveness of existing support to developing countries.

Limited governmental finances and **budgets** allocated to NMHS & NDMA.



The **complexities of forecasting**



Market barriers to creating enabling conditions

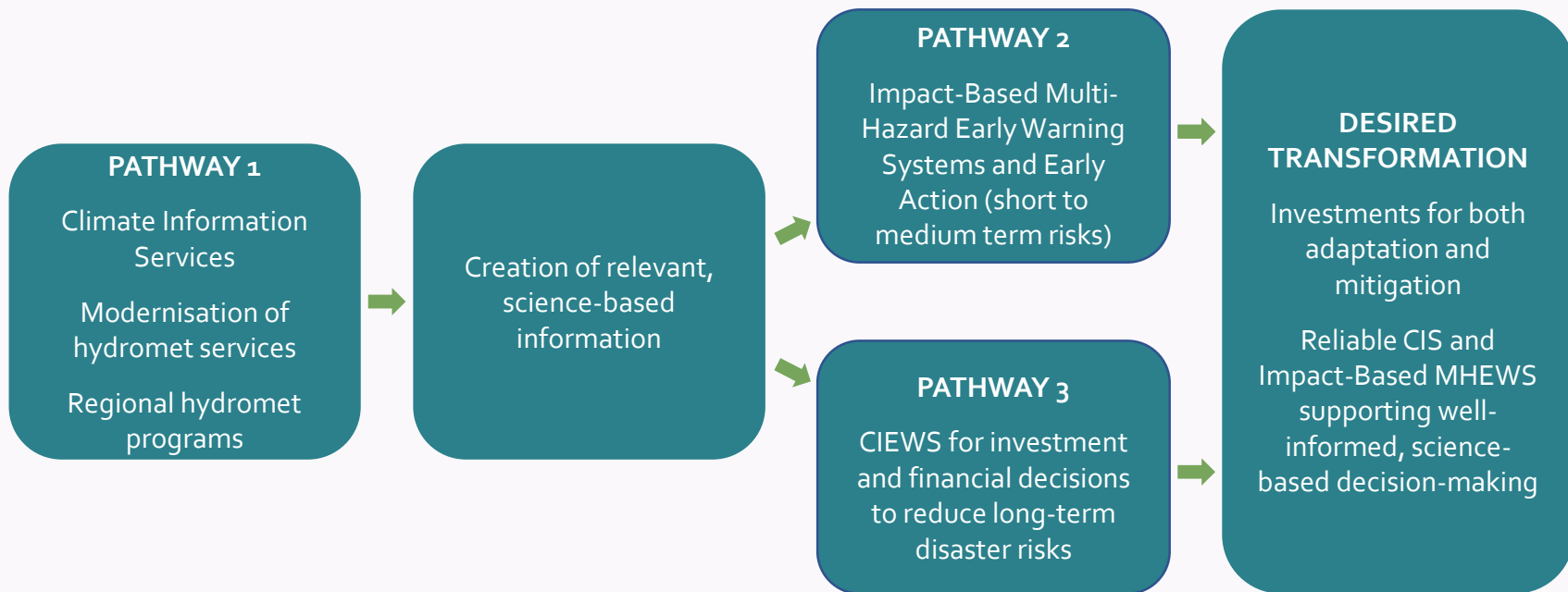


Growing Demand for GCF CIEWS Support



- Growing demand for GCF to support CIEWS
 - 21 % for modernising hydromet (generation of CIEWS)
 - 79% for sector applications (use of CIEWS)
- Paradigm shift achieved through:
 - systematic investment in CIEWS value chain
 - incentivising use of CIEWS for investments and analytics
 - supporting long term planning and preparedness
 - promoting low emission and climate resilient development
- Without GCF support, the majority of developing countries will not be able to establish and operate the fit-for-purpose CIEWS required to achieve this paradigm shift

CONCEPTUAL FRAMEWORK OF THE PARADIGM-SHIFTING PATHWAYS



21% of portfolio

79% of portfolio

PATHWAY 1: CLIMATE INFORMATION SERVICES



Making robust climate services widely available

- Supporting development of CIS through modernisation of hydromet services:
 - technical capacity development (optimization, gap-filling and upscaling)
 - digital technologies/e-infrastructure to transform the generation, management and delivery of climate services
 - Operationalization of the GFCS
 - business delivery models (PPP, GBON/SOFF, blended finance)
 - drive uptake and investments (policy, governance and political)
 - institutional effectiveness
- Enabling creation of relevant, science-based information for pathways 2 and 3
- Two subcomponents:
 - modernisation of hydromet services
 - regional hydromet programmes (economy of scale)

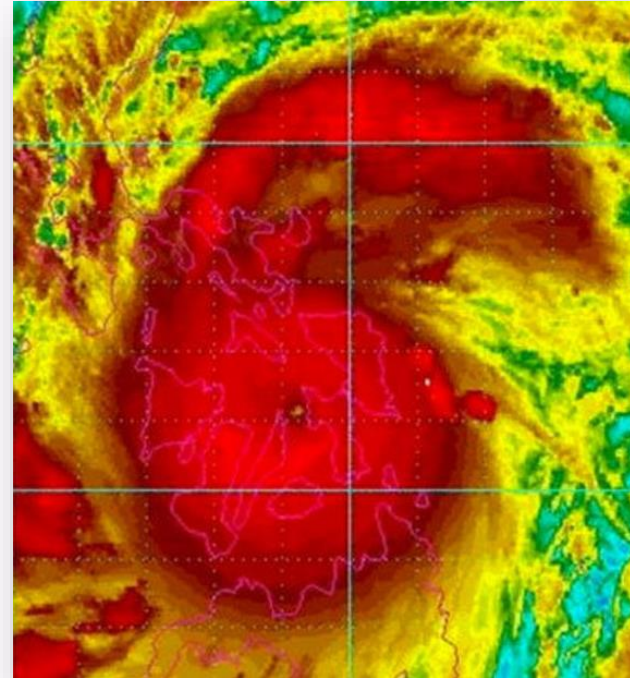


PATHWAY 2: IMPACT-BASED MHEWS AND EARLY ACTION



Making robust early warning and early action services widely available

- Modernize disaster management and related agencies, CBO and partners to ensure that investments in CIEWS result in:
 - lives saved
 - livelihoods and development gains protected
 - climate-related risks managed more effectively
- Focus on short- to medium-term risks by optimising, establishing and scaling up mechanisms for delivering IB-MHEWS, linked to:
 - community development programmes
 - governments and shock-responsive social protection mechanisms
 - International preparedness and response
 - private sector business continuity programmes
 - Forecast-based financing/action, insurance
- Two subcomponents:
 - impact-based MHEWS
 - anticipatory action (forecast-based action)



PATHWAY 3: CIEWS FOR INVESTMENT AND FINANCIAL DECISIONS TO REDUCE LONG-TERM DISASTER RISKS CIEWS



- Application of CIEWS analytics to deliver a paradigm shift for asset owners across all GCF result areas, the digital economy, weather derivatives and commodities markets, and insurance companies that seek to protect their investments against medium- to long-term risks.
- Strengthening approaches for assessing, avoiding, reducing, and transferring the risks and adverse impacts of climate disasters, and so increasing the resilience of assets and vulnerable populations
- Five private sector areas to maximize mobilization and impact: climate funds, financial institutions, project finance, climate markets, climate technology and Innovation
- Specific GCF investments would include:
 - digital financial technologies (e.g. Fintech, AI, Big data, blockchain, cloud)
 - climate analytics for managing financial risks in private sector markets
 - climate analytics for managing risks in public sector markets



CIEWS Sectoral Guide

Transformational planning & programming

Catalyzing climate Innovation

Mobilization of finance at scale

Coalitions and knowledge to scale up success

Climate Information Services

- Support establishment of National Framework for Climate Services to strengthen generation and uptake of climate services
- Mainstream CIS in policies and plans across all priority sectors
- Enhance CIS for projects across the 8 result areas, NAPs, NDCs and national development plans
- National and regional optimisation of investments in hydromet

- Operationalise GFCS at scale
- Enhance hydromet service provision from basic to full, optimising infrastructure through regionalisation and gap-filling.
- New public-private partnership business delivery models
- E-infrastructure to reduce cost and enhance efficiency
- Create enabling environment for growth in hydromet services

- Optimise GCF financial instruments to match needs of beneficiaries
- Innovative financing solutions (including blended finance)
- Enhance resource mobilise from SOFF, GEF, AF
- Ring-fence national climate funds and other funding sources for hydromet services
- Scale up government budgetary allocation for hydromet services

- Knowledge platforms for sharing best practices in modernisation of climate services
- Institutional collaborative platforms to enhance knowledge in CIS, digital technologies and business delivery models
- Identify best practices and lessons learned to strengthen political, policy and governance capacity in hydromet services

Impact-Based Multi-Hazard Early Warning Systems and Early Action

- Integrate IB-MHEWS in planning, policy and decision making at all levels
- Enhance mechanisms for strengthening capacity at all stages of IB-MHEWS value chain
- Community engagement in designing and implementing forecast-based action at all levels
- Project pipeline development

- Make fit-for-purpose IB-MHEWS widely available by strengthening capacity
- Enhance community-based MHEWS through capacity building of communities, and institutions
- Pilot disaster communication systems using digital technologies
- Enhance mechanisms for delivering and scaling up FbA

- Innovative financing solutions (including blended finance)
- Scale FbA through dedicated funds, insurance and market-based mechanisms, standard resource allocation processes
- Embed FbA in financing and delivery systems at scale, working with private sector and informal non-banking institutions

- Institutional collaborative platforms for climate-informed surveillance systems, assessments, and policies
- Community knowledge platforms to integrate indigenous knowledge
- Knowledge brokering, knowledge management, evaluation and learning, impact evaluation and feedback in IB-MHEWS and FbA
- Evidence base for FbA

CIEWS for investment and financial decisions to reduce long-term disaster risks

- Strengthen the use of digital technologies for climate investment and financial decisions
- Enhance the use of climate analytics for managing financial risks in public sector markets.
- Enhancing the use of climate analytics for managing risks in private sector markets
- Project pipeline development

- Promote digital technologies and enabling environment for climate investment and financial decisions
- Establish market place for digital technology in climate finance
- Enhancing the use of climate analytics for managing financial risks

- Scale up financing of climate analytics and digital technologies
- Digital technology startup funding through crowd-sourcing
- Climate analytics startup funding for managing investment and financial risks in private sector through crowd-sourcing

- Establish knowledge platforms for sharing best practices in digital technologies and climate analytics for climate finance and investments
- Establish Innovation hub for climate analytics and digital technologies in climate finance

Paradigm-shifting pathways

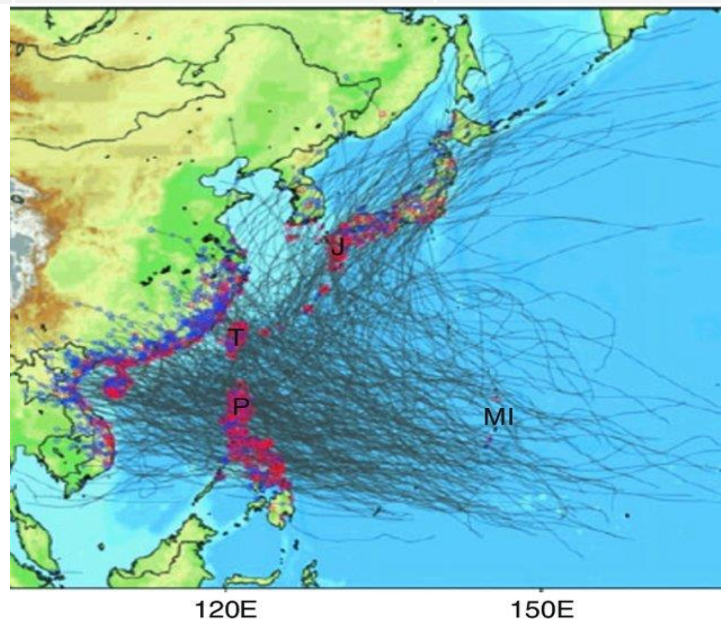


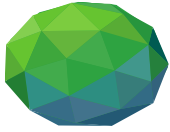
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UNEP PACIFIC CIEWS MULTI-COUNTRY PROGRAMME

Country	GCF financing	Accredited entity	Financial instrument	Year approved
Cook Islands, Niue, Palau, Republic of the Marshall Islands and Tuvalu	USD 47.4 million	UNEP	Grant	2020

- Support increased climate-resilient sustainable development in 5 Pacific countries through targeted CIEWS investments
- CIS strengthening through capacity building and improved policy frameworks
- Investments in climate and marine infrastructure and data management
- Community-based EWS and disaster risk management
- Establishment of regional knowledge and data hub





SAFEGUARDING RURAL COMMUNITIES AND THEIR PHYSICAL ASSETS FROM CLIMATE INDUCED DISASTERS IN TIMOR LESTE

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Country	GCF financing	Accredited entity	Financial instrument	Year approved
Timo-Leste	USD 22.36 million	UNDP	Grant	2018

- **Impact-based Multi-hazard EWS for climate resilient rural infrastructure planning & management**
 - Forecasting, risk modeling, communication & response
- **Climate risk reduction & risk-proofing measures for strengthening resilience of small-scale rural infrastructure**
 - 47 slope stabilization projects (216.94 km)
 - 38 enhanced water supply systems
 - 25 improved irrigation systems (54.18km)
 - 20 flood defenses (14.15 km)
 - 300 ha of agroforestry and reforestation





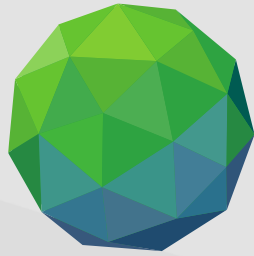
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IFAD AICRFP AFRICA-SAHEL

Country	GCF financing	Accredited entity	Financial instrument	Year approved
Burkina Faso, Chad, Gambia, Mali, Mauritania, Niger, Senegal	USD 83 million	IFAD	Grant	2021

- First sub-program of the Great Green Wall Initiative
- Sahel region of Western Africa is exceptionally vulnerable to climate change
- The programme to build, strengthen and scale up the resilience and adaptive capacities of smallholder farmers and rural communities of 7 LDCs in Sahel region.
- It will provide capacity building and institutional development on integrated climate risks management.





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ENHANCING CLIMATE INFORMATION SYSTEMS FOR RESILIENT DEVELOPMENT IN LIBERIA (LIBERIA CIS)

Country	GCF financing	Accredited entity	Financial instrument	Year approved
Liberia	USD 10 million	ADB	Grant	2020

- Liberia currently lacks the capacity to prepare for and respond to climate-related extreme events.
- The project will improve hydrometeorological service generation & provision, in line with WMO requirements.
- It will also enhance preparations and response to climate hazards through an enabling environment, appropriate legislation, agency coordination as well as implementing an effective impact-based forecasting and forecast-based financing mechanism.



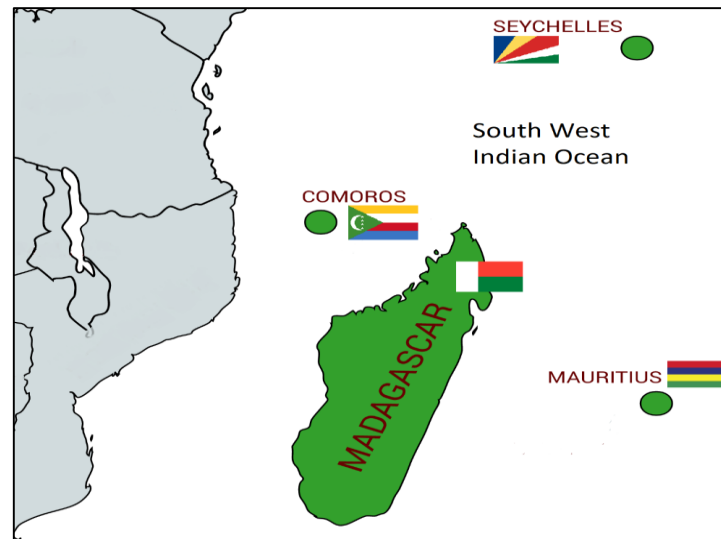


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BUILDING REGIONAL RESILIENCE THROUGH STRENGTHENED METEOROLOGICAL, HYDROLOGICAL AND CLIMATE SERVICES IN THE INDIAN OCEAN COMMISSION (IOC) MEMBER COUNTRIES

Country	GCF financing	Accredited entity	Financial instrument	Year approved
Comoros, Madagascar, Mauritius, Seychelles	USD 52.8 million	AFD	Grant	2021

- The Southwest Indian Ocean region is highly vulnerable to climate change impact, particularly tropical cyclones
- The project will support the countries in the region to overcome barriers in managing the risks and impacts of climate-induced disaster.
- By implementing a multi-hazard early warning system, the project will equip decision makers and communities with adequate tools to prepare for and adapt to climate variability and change.



GLOBAL CONTEXT



Climate impacts

- ❑ In the last 50 years, storms (i), floods (ii), tropical cyclones (iii) and droughts (iv) caused 3.7 million deaths and 7.6 billion people were affected (Guha-Sapir 2018).
- ❑ Global economic losses during this period amount to more than 2.4 trillion US\$ - or 0.2% of world GDP each year.
- ❑ Relative to GDP, small island developing states and African countries experience the heaviest damages.
- ❑ Costs are increasing: 50 Bn US\$ / yr (2007); 70-100 Bn US\$ / yr (2010), 280-500 Bn US\$ / yr (2016).
- ❑ The cost of establishing and operating fit-for-purpose CIEWS too expensive for non-annex I countries.

NDC, NAPA, NAP

- ❑ All 13 Parties which have submitted NAPs as of June 2019 mention climate information.
- ❑ Early Warning Systems (EWS) are found in 50% of the NDCs submitted.
- ❑ Ambition is clear, but the identification of action is lacking, even in countries that are highly vulnerable to climate change.
- ❑ Quality of the information provided is low, in most cases superficial and incomplete.

Market assessment

- ❑ Lowest capacity in sub-Saharan Africa.
- ❑ Growth of the sector driven by vibrant private sectors (energy, aviation, large scale agriculture, infrastructure resilience).

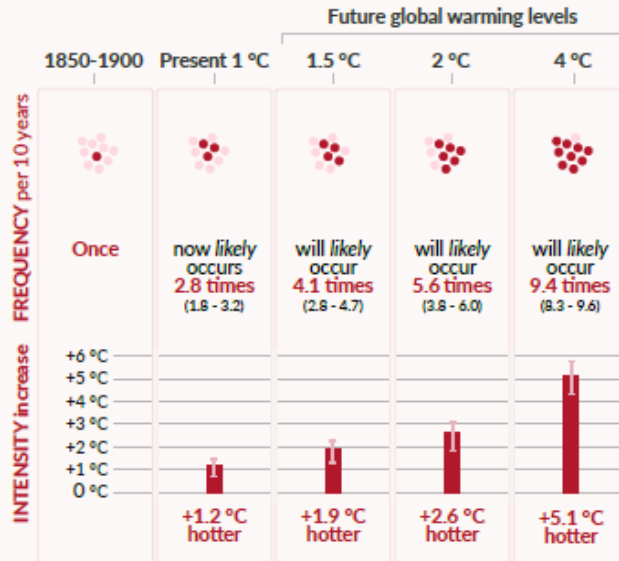
IPCC 6TH ASSESSMENT REPORT



Hot temperature extremes over land

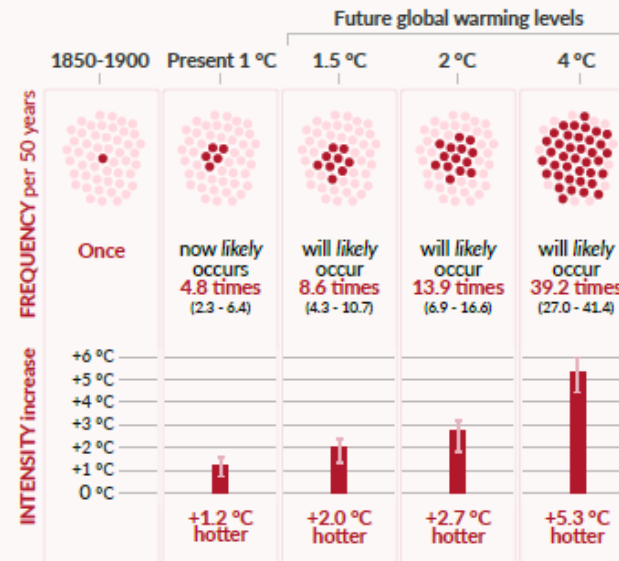
10-year event

Frequency and increase in intensity of extreme temperature event that occurred once in 10 years on average in a climate without human influence



50-year event

Frequency and increase in intensity of extreme temperature event that occurred once in 50 years on average in a climate without human influence

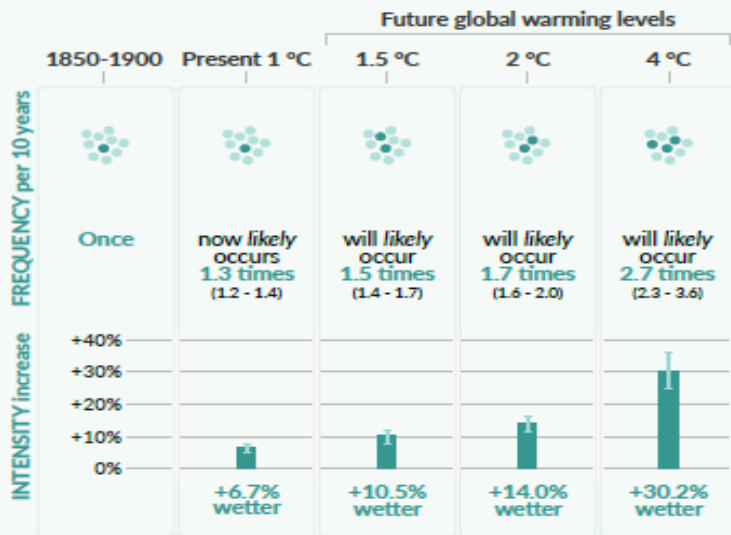


IPCC 6TH ASSESSMENT REPORT



Heavy precipitation over land 10-year event

Frequency and increase in intensity of heavy 1-day precipitation event that occurred once in 10 years on average in a climate without human influence



Agricultural & ecological droughts in drying regions 10-year event

Frequency and increase in intensity of an agricultural and ecological drought event that occurred once in 10 years on average across drying regions in a climate without human influence

