

Climate change 2022: impacts, adaptation and vulnerability. Summary for policymakers

Working Group II contribution to the Sixth Assessment
Report of the Intergovernmental Panel on Climate
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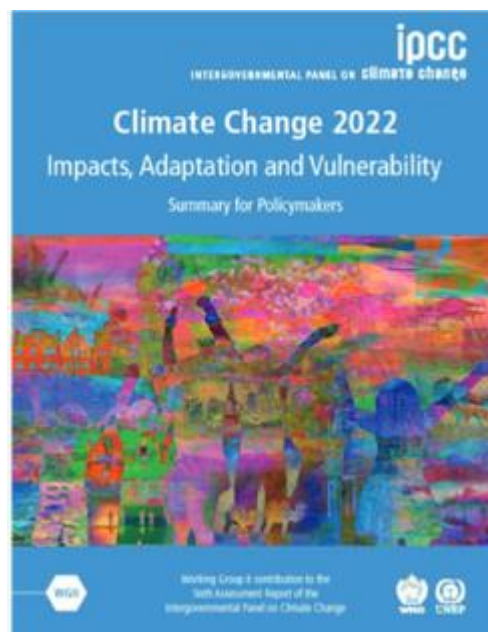
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This is a summary document of the contribution of the IPCC's Working Group II to the Sixth Assessment Report (AR6). It assesses the impacts of climate change, looking at ecosystems, biodiversity and human communities at global and regional levels. It also reviews vulnerabilities and the capacities and limits of the natural world and human societies to adapt to climate change. The three main sections deal with: (i) observed and projected impacts and risks; (ii) adaptation measures and enabling conditions and (iii) climate resilient development.

Observed and projected impacts and risks

The report is unequivocal when it concludes that human-induced climate change has caused widespread adverse impacts and related losses and damage to nature and people beyond natural climate variability. The manifestations of climate change are described in detail and reflect what we constantly read about in global news reports. These include: heat-related human mortality; coral bleaching; tree mortality; wildfires; cyclones; sea-level rise and permafrost thaw.

However, as is to be expected, the report drills deeper into the subject and records severe problems related to damage to terrestrial, freshwater and marine ecosystems; species loss; migration and extinctions. There is also reduced food and water security, which is hindering efforts to achieve the UN's Sustainable Development Goals (SDGs): half of the world's population experiences severe water scarcity and agricultural growth has slowed. Climate change is also adversely affecting human mental and physical health with increased incidences of diseases and zoonoses. There are also increased problems associated with



displacement and involuntary migration. As you can see, there is a wealth of information, compiled by a global network of dozens of scientists. The report is a rewarding source of clear thinking and careful analysis, but limited space here will allow for only a short summary of other themes explored.

Vulnerability and exposure of ecosystems and people

Some 3.3 to 3.6 billion people are highly vulnerable along with a high proportion of other species. Current unsustainable development patterns are increasing the exposure of ecosystems and people to climate hazards.

Risks in the near-term (2021–2040) include reaching a 1.5°C rise in global temperatures (above pre-industrial levels in the period 1850–1900) which is likely to cause unavoidable increases in climate hazards with multiple risks to ecosystems and humans. For 127 identified risks, the mid- to long-term impacts (ie from 2041 to 2100) are assessed as being multiple times higher than currently observed.

The impacts and risks associated with climate change are becoming increasingly complex and more difficult to manage. Interactions and simultaneous occurrences will have consequences that will cascade across sectors and regions. The impacts of a temporary overshoot (of 1.5°C) will be severe and often irreversible and will affect low-resistance ecosystems (eg in polar, mountain and coastal regions) most severely.

Current adaptation and its benefits

To date, adaptation efforts have been mostly via the adjustment of existing systems and implementation has been heavily dependent on governance. Progress has been observed across all sectors and regions and has generated multiple benefits, but at the same time progress has been uneven and goals short term. The effectiveness of adaptation options decreases with increasing warming.

Soft limits to adaptation have been reached in some locations, but these can be overcome by careful investment. Many natural systems are near the hard limits of their natural adaptation capacity (eg coral reefs, coastal wetlands, rainforests, and polar and mountain ecosystems).

Although progress has been made, there is also increasing evidence of maladaptation since AR5 (see: ‘Climate change impacts and mitigation: a review of prediction and reality’, Ag4Dev, 22, pp 29–31, 2014). These are mainly due to a concentration on short-term gains and a focus on reducing sector risks in isolation; examples are fire suppression in fire-adapted ecosystems and hard flood defences. There are severe risks with solar-radiation modification schemes which, in any case, won’t stop increases in CO₂ production or ocean acidification (see the review of Elizabeth Kolbert’s Book Under a white sky in Ag4Dev 43 pp 34–35, 2021). Planning has to be long term and enabling conditions are essential for adaptation: these include political commitment and follow-through and access to adequate financial resources.

Climate resilient development

Worldwide, the need to implement climate resilient development (CRD) has become much more urgent since AR5. There is a rapidly narrowing window of opportunity to enable CRD and the pathways are progressively constrained by every increment in warming. CRD is enabled when governments, civil society and the private sector make inclusive development choices and pathways result from cumulative societal change. The global trend towards increased urbanisation can offer opportunities for CRD with integrated, inclusive planning and investment.

Safeguarding biodiversity and ecosystems is fundamental to CRD and the urgent need is for effective and equitable conservation of approximately 30–50 percent of Earth's land, freshwater and ocean areas. The final section of the report deals with achieving CRD and carries some potent words and warnings. It is unequivocal that climate change has already disrupted human and natural systems. CRD is already challenging and will be further limited if warming exceeds 1.5°C and may not be possible over 2°C. It will require increased international cooperation, including mobilising and enhancing access to climate finance (for mitigation and adaptation). The cumulative scientific evidence shows clearly that climate change is a threat to human wellbeing and planetary health. We are responsible for the breakdown of our planetary climate system and so, surely, it falls to us to stop and repair the damage in the rapidly closing window of opportunity that remains. On current evidence, however, it seems that we as a species are about to destroy our unique habitat and ourselves with it.

Brian Sims

(TAA Member)