



A review of Intergovernmental Panel on Climate Change(IPCC) reports

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Abstract :

In order to prevent catastrophic climate change, humanity has one generation, from now until 2050, to reduce its greenhouse gas emissions to zero. Founded in 1988 by the World Meteorological Organization and the United Nations Environment Programme, the IPCC's mission is to provide the international community with the most recent scientific, technical, and socioeconomic information on climate change. Since then, the IPCC's multivolume assessments have been crucial in persuading countries to adopt and implement measures to combat climate change, such as the United Nations Framework Convention on Climate Change and the Kyoto Protocol.

Introduction

The IPCC's first Assessment Report (FAR) from 1990 framed climate change as a global problem that could only be solved by international cooperation. "It was instrumental in the creation of the United Nations Framework Convention on Climate Change (UNFCCC), the primary international treaty for combating global warming and adapting to its effects. The Kyoto Protocol was ratified in 1997 in large part due to the facts presented in the Second Assessment Report (SAR) (1995). The Third Assessment Report (TAR) addressed the effects of climate change and the need to adapt (2001). The AR4 (2007) established the framework for a post-Kyoto accord, with an emphasis on holding warming to far below 2 degrees Celsius. In 2007, the International Panel on Climate Change (IPCC) and then-Vice President of the United States Al Gore shared the Nobel Peace Prize for their efforts to raise awareness of and facilitate education about climate change brought on by human activities and lay the groundwork for the measures necessary to counteract this threat.

An impartial review of IPCC methodologies was sought by UN Secretary-General Ban Ki-moon and IPCC Chair Rajendra Pachauri in March 2010. (IAC). The IAC delivered its findings and recommendations in August of 2010. In subsequent meetings, IPCC members considered these comments and implemented various reforms in response. The scientific foundation for the Paris Agreement was laid in the Fifth Assessment Report (AR5), published between 2013 and 2014. The IPCC is currently working on the Sixth Assessment Report and three separate Special Reports.



The IPCC became 30 years old in 2018. Some countries held conferences or other events to mark the occasion.

Under the Paris Agreement, worldwide governments requested a series of five Special Reports, the first of which is entitled Global Warming of 1.5°C (SR15). The IPCC released its 2019 Refinement in May, which revised their 2006 Guidelines for National Greenhouse Gas Inventories. Both the Special Report on Climate Change and Land and the Special Report on the Ocean and Cryosphere in a Changing Climate were expected to be released in 2019. There will be a first worldwide stocktake the year after the completion of the Sixth Assessment Report (AR6), which is planned for 2022”.

Highlights of IPCC First Assessment Report

The report was broken up into parts based on the IPCC's three scientific Working Groups. A summary for decision-makers was included in each section. Similar Assessment Reports were produced thereafter. Policymakers will find the following information in the report's executive summary from Working Group I:

- The following is, in our opinion, undeniable: “While greenhouse gases including carbon dioxide (CO₂), methane (CH₄), chlorofluorocarbons (CFCs), and nitrous oxide (N₂O) have always been in the atmosphere, their levels are steadily rising due to human activity. The greenhouse effect will be exacerbated by these increases, leading to an overall higher surface temperature rise for Earth. The main greenhouse gas, water vapour, will increase in response to global warming, exacerbating the problem. • CO₂ is responsible for more than half of the increased greenhouse effect; rapid reductions in human activity emissions of more than 60 percent are needed to stabilise long-lived gases at current concentrations.
- During the [21st] century, we anticipate an increase in global mean temperature of about 0.3 °C per decade, which is greater than that seen over the past 10,000 years, and an increase in global mean temperature of about 0.2 °C to about 0.1 °C per decade under other scenarios that assume progressively increasing levels of controls.
- Due to our limited knowledge of greenhouse gas (GHG) sources and sinks, clouds, oceans, and polar ice sheets, our projections are fraught with uncertainty. This is especially true with regards to the timing, amplitude, and regional patterns of climate change.



- Over the last century, we've seen a rise in global average surface air temperature of 0.3 to 0.6 degrees Celsius, which is consistent with projections from climate models but is also within the range of natural climatic variability, as shown by our analysis. Therefore, natural variability may be responsible for most of the observed increase; conversely, this variability and other human influences may have attenuated a greater human-induced greenhouse warming. It's likely to be at least ten years before the amplitude of the greenhouse effect is determined with any certainty.
- Due to thermal expansion of the oceans and melting of some land ice, the IPCC's business as usual emissions scenario projects a global mean sea level rise of around 6 centimeters per decade over the next century (with an uncertainty range of 3 to 10 centimeters per decade). By the end of the century, experts predict a 65-centimeter increase from where we are now”.

Highlights of IPCC Second Assessment Report

In its 1995 Second Assessment Report (SAR), the Intergovernmental Panel on Climate Change (IPCC) examined the available scientific and socioeconomic evidence on climate change. There were four parts to the report:

- “The Science of Climate Change (WG I), Climate Change Impacts, Adaptations, and Mitigation (WG II), and the Economic and Social Dimensions of Climate Change (WG III): a synthesis to help in the interpretation of UNFCCC article 2.
- These last three sections, each of which was completed by a separate Working Group (WG), include a Summary for Policymakers (SPM) that articulates the consensus of national representatives. According to the findings of Working Group I, which is in charge of the climate change science, carbon dioxide is still the principal contributor to human climate change forcing; future estimates of global mean temperature change.
- Given the vast time scales that regulate the building of greenhouse gases in the atmosphere and the climate system's reaction to those accumulations, many crucial features of the potential for human activities to modify Earth's climate to unprecedented levels remain unknown.



Highlights of IPCC Third Assessment Report

Three Working Groups contributed to the Third Assessment Report's completion in 2001. The first group to go to work is the Scientific Basis. Effects, Change, and Exposure Synthesis Report, Group II Working Paper, Group III Mitigation Paper. Among the most significant results are the following:

- Global warming is seen at the surface of the Earth. Most certainly, the 1990s were the hottest decade ever recorded by instrumental means.
- Since the middle of the 20th century, atmospheric concentrations of anthropogenic, or human-emitted, greenhouse gases have grown dramatically”.
- The majority of the observed warming is most likely attributable to human activity.
- Warming in the 21st century is expected to be quicker than any other period in at least the previous 10,000 years, according to projections based on the Special Report on Emissions Scenarios.
- Some ecosystems and species will be degraded or wiped out altogether as a result of climate change and other pressures.
- While adaptation to climate change may mitigate some of the bad impacts and perhaps provide some immediate secondary benefits, it will not be enough to prevent all unfavourable outcomes. One kind of adaptation to climate change is the construction of levees in areas where sea levels are expected to rise.

Highlights of IPCC Fourth Assessment Report

Observational data collected from all seas and continents show that rising temperatures have far-reaching effects on a wide variety of biological systems and regional climate shifts.

Many physical and biological systems have been affected by human-caused warming, according to a global examination of data collected since 1970.

- More subtle consequences of climate change on natural and human environments are emerging, although distinguishing them often proves challenging for a variety of reasons, including adaptation and extra-climatic influences.



- For many systems and sectors, including those that were not included in earlier assessments, we now have access to more accurate information on the nature of potential consequences.
- For several regions that had not been evaluated before, more in-depth data on the nature of possible consequences is now available.
- It's now possible to do more in-depth analyses of the relative importance of the many projected rises in the global average temperature.
- Extreme weather, climate, and sea-level occurrences are likely to alter as a result of human intervention.
- After the turn of the twenty-first century, some types of global climate disasters might have unimaginably devastating effects.
- While the effects of climate change may vary depending on where you live, it's probable that, when added together and discounted to the present, they'll result in an annual net cost into the foreseeable future as the world warms.
- Adaptation to current and projected climate change is occurring, although on a small scale.
- The warming produced by previous emissions is inevitable, thus we must adapt to its impacts.
- While there are a number of options for adjusting to a changing climate, it will be crucial to take more steps toward adaptation than are now being made. Challenges, limitations, and costs are not fully understood.
- “Vulnerability to climate change may be exacerbated by the existence of other stresses.
- Vulnerability in the future will depend on both climate change and the kind of economic development that is prioritized.
- Climate change might make it harder for countries to achieve sustainable development routes, while sustainable development can reduce their vulnerability to climate change.
- Many unfavorable outcomes may be avoided, lessened, or delayed by mitigation efforts.

Highlights of IPCC Fifth Assessment Report



United Nations Intergovernmental Panel on Climate Change (IPCC) completed its Fifth Assessment Report in 2014. (AR5).

- Many of the changes that have taken place in the climate system since the 1950s are unprecedented throughout decades to millennia, as stated by Working Group I and summarised in AR5's summary. The quantities of carbon dioxide, methane, and nitrous oxide in the atmosphere have risen to levels not seen in at least 800,000 years. It's inarguable that people have had an effect on the global climate. Human activity between 1951 and 2010 was the main cause of global warming (95-100%)
- Working Group II: The likelihood of severe, pervasive, and irreversible impacts grows as global warming becomes more severe, extensive, and irreversible. The overall hazards of climate change effects may be reduced by limiting the pace and magnitude of climate change. One of the first steps in preparing for the effects of climate change is lowering one's vulnerability and exposure to the weather as it is now.
- If we don't do anything to stop climate change, the world's average temperature is expected to climb by 3.7 to 4.8 degrees Celsius by 2100, compared to pre-industrial levels, according to the Working Group III (median values; the range is 2.5 to 7.8 degrees Celsius considering climatic uncertainty). It is widely agreed that we need to limit warming to between 1.5 and 2 degrees Celsius over pre-industrial levels, yet the present trajectory of global annual and cumulative GHG emissions is incompatible with this aim. Cancn Agreements pledges are generally consistent with low-cost scenarios that have a good chance (66-100 percent probability) of limiting global warming to well below 3 degrees Celsius (in 2100) compared to pre-industrial levels.

Highlights of IPCC Sixth Assessment Report

The IPCC's Sixth Assessment Report (AR6) examines climate change's scientific, technological, and socioeconomic data. Three Working Groups (WGI, II, and III) have been working on the following topics: i) The Physical Science Basis (WGI), ii) Impacts, Adaptation, and Vulnerability (WGII), and iii) Climate Change Mitigation (WGIII). The first report was released in 2021, followed by the second in February 2022 and the third in April 2022". By late 2022, IPCC will complete the final synthesis report.



- To keep global temperatures from increasing more than 2 degrees Celsius, international collaboration must be substantially more robust than it is currently. Many developing nations require more incredible help from other countries for concrete climate action than they do now. The study takes several novel techniques, including many societal issues and youth, indigenous peoples, cities, and enterprises, into the solution. According to the research, demand-side mitigation strategies can cut GHG emissions by 40%–70% by 2050 compared to scenarios in which nations achieve their national promises made before 2020. Those actions should be linked with enhancing fundamental welfare for everybody to be implemented successfully.
- According to the report, carbon dioxide removal is required to achieve a net-zero decrease. The paper examines carbon dioxide removal (CDR) techniques, such as agroforestry, reforestation, blue carbon management, peatland restoration, etc. It is expected that cities can produce 65 GtCO₂ by 2050 if no action is taken. Emissions can be reduced directly and indirectly through urban woods, lakes, and other blue and green infrastructure. Mixed-use spaces, transportation, walking, cycling, and car-sharing can cut urban emissions by 23–26%. In 2019, buildings accounted for 21% of worldwide GHG emissions. They may reduce their emissions by 80%–90% while also assisting in achieving other Sustainable Development Goals. The report introduces a new plan for decreasing GHG emissions in buildings: SER stands for self-sufficiency, efficiency, and renewable energy. Sufficiency. The study notes that global climate action has improved. For example, thanks to reforestation in Europe, Asia, and North America, deforestation decreased after 2010, and the total forest cover grew in recent years.

Conclusion

Human-caused climate change is generating a severe and widespread upheaval in nature, impacting the lives of billions of people throughout the globe despite attempts to mitigate the dangers. Those populations and ecosystems who are least able to handle the changes will be the ones to feel the most impact. Over the next two decades, the globe will confront a number of climatic difficulties as a result of a warming of the Earth's atmosphere of 1.5°C (2.7°F). There



would be substantial, long-lasting consequences even at this amount of warming. Greater attention will be paid to infrastructure and low-lying coastal settlements as a result of human civilization's progress. Extreme weather events such as heat waves, droughts, and floods are pushing plant and animal populations to the brink, leading to mass extinctions of ecosystems like forests and reefs. Since these weather extremes are happening at the same time, they are having knock-on effects that are becoming harder to control. They have endangered the food and water supplies of millions of people in the Arctic, Small Islands, Africa, Asia, and Central and South America.

Aggressive, fast adaptation to climate change is required, as are rapid, deep reductions in greenhouse gas emissions, to limit future loss of life, animals, and infrastructure. There has been uneven progress on adaptation, and the gap between what has been done and what is needed to address emerging risks is widening. The greatest inequalities are experienced by those with lower incomes. Research from the scientific community shows that climate change poses a serious risk to human health and the global environment. There has been a rise in the prevalence of adaptations with unintended consequences, such as harm to the environment, endangering the lives of people, or boosting emissions of greenhouse gases. Involving all stakeholders, prioritising equity and justice, and tapping into Indigenous and regional expertise may help avert this. Any further delay in concerted global action runs the danger of missing a rapidly closing window to ensure a habitable future.

Bibliography

1. About the IPCC. Intergovernmental Panel on Climate Change. Available: <https://www.ipcc.ch/about/>.
2. The IPCC: Who Are They and Why Do Their Climate Reports Matter?. Union of Concerned Scientists: Reports & Multimedia - Activist Resources: Explainers. Union of Concerned Scientists. 11 October 2018.
3. IPCC Second Assessment Report: Climate Change 1995, WG1. ch 8, summary, pp. 412, 439, xi
4. Synthesis Report of the IPCC Third Assessment Report: Summary for Policymakers. Cambridge University Press. 2001. ISBN 0 521 80770 0.



5. Synthesis Report of the IPCC Fourth Assessment Report (Climate Change 2007):
Summary for Policymakers. IPCC. 2007. ISBN 92-9169-122-4.
6. Leaflet: Fifth Assessment Report (PDF), IPCC, 2014 Available:
https://www.ipcc.ch/site/assets/uploads/2018/04/ipcc_ar5_leaflet.pdf
7. Sixth Assessment Report — IPCC. Available: <https://www.ipcc.ch/assessment-report/ar6/>