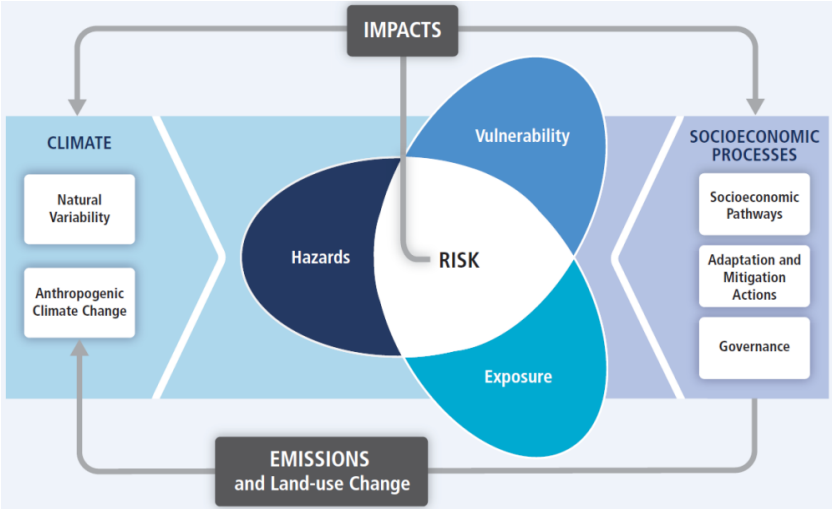
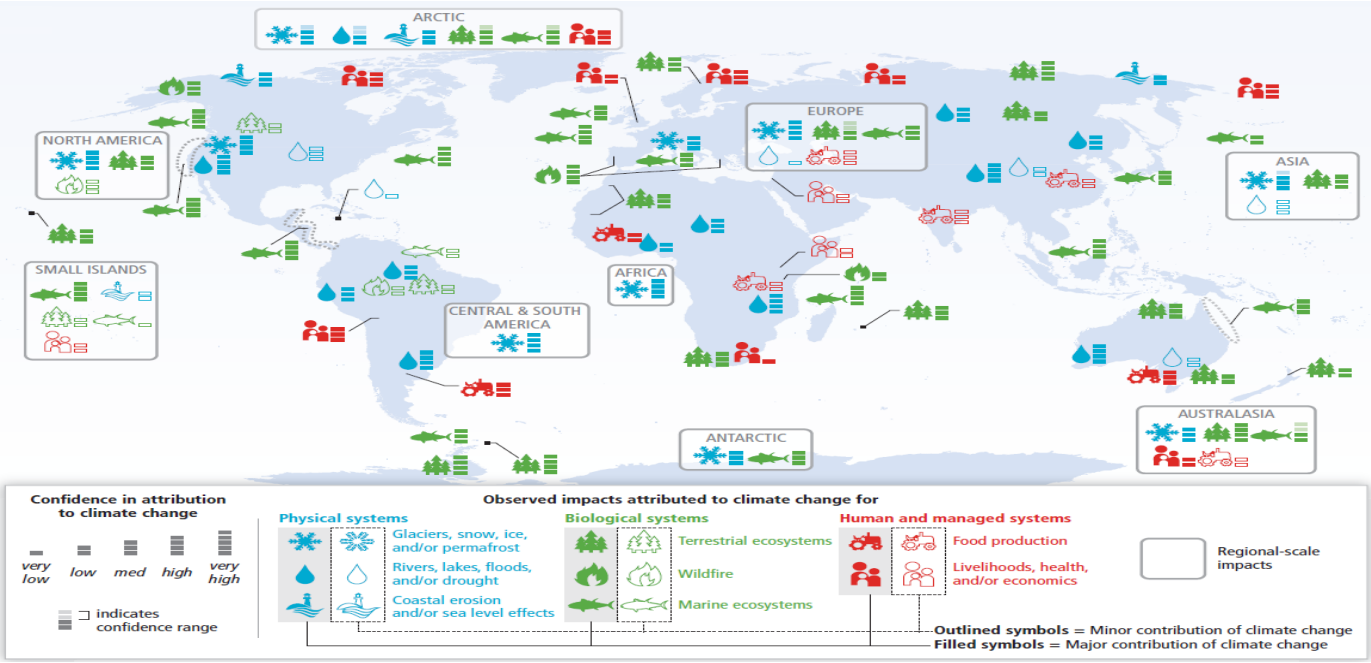
Gleaning from the Report on The SED on The 2013–2015 Review UNFCC & Paris Implications



Source: Summary for policymakers in the contribution of Working Group II (WGII) to the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change, figure SPM.1. The figure illustrates the constituents of 'risk' – the fundamental concept used throughout AR5 by WGII. Extracted from UNFCC (2013-2015)

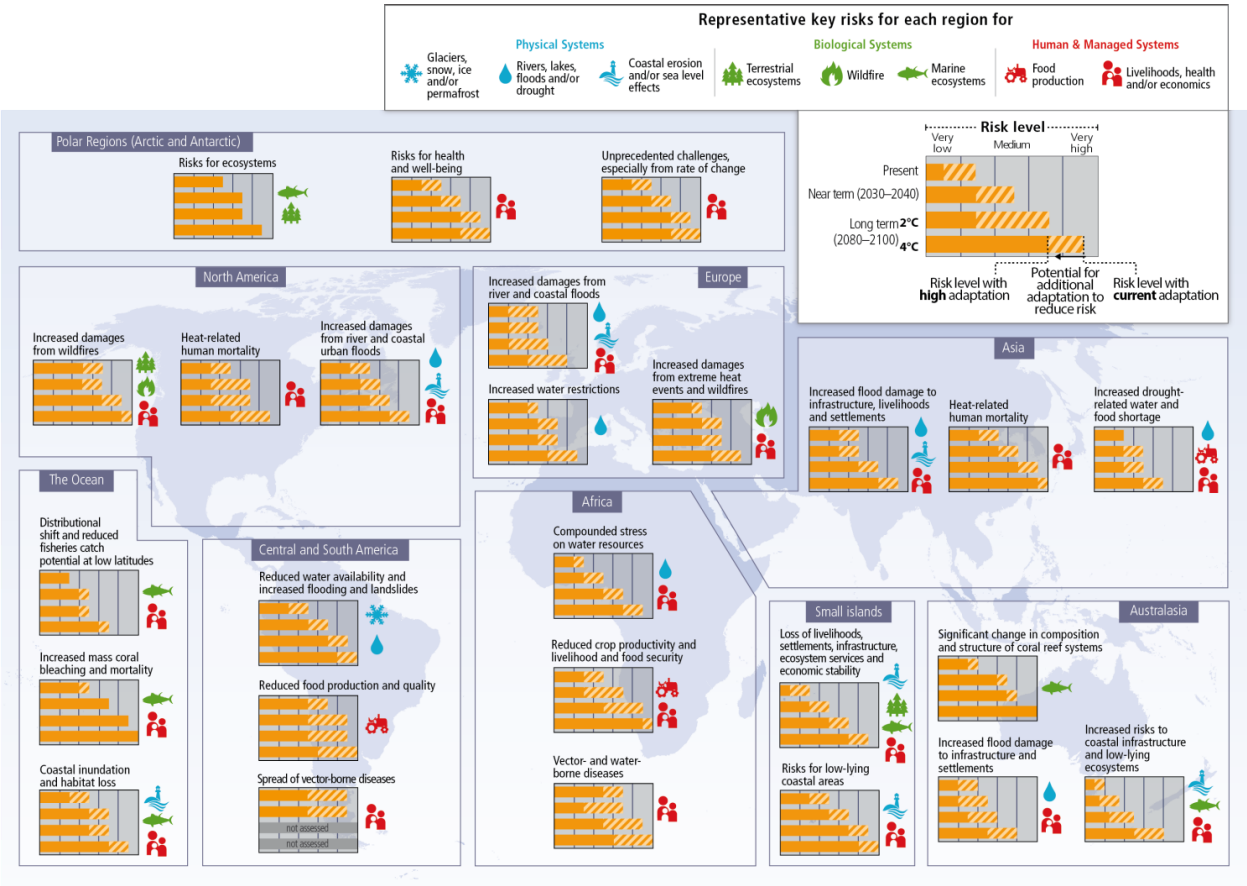


Source: Summary for policymakers in the contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, figure SPM.2(A). The figure shows that various attributed impacts have been found in all sectors and regions, albeit with significant differences.

ROBERT MBURIA

Overview

2014 was the hottest year since 1880s (World Metrological Organization). Subsequently global temperatures have rose since 1880s by 0.85°C. Oceans have absorbed more than 90% of the energy accumulated between 1971 and 2010. There is an extremely likelihood that global temperatures will exceed 1.5°C by 2100 while RCP4 notes that warming is likely to exceed 2°C and continue rising by 2100. As heat waves increase in frequency and duration; anthropogenic climate change with multiple impacts that include ocean acidification are irreversible on a multi-century millennial timescale.



Source: Summary for policymakers in the Synthesis report of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, figure SPM.8. The figure shows representative key regional risks, assessed as very low, low, medium, high, or very high. Risk levels are presented for three time frames: present, near term (2030–2040), and long term (2080–2100). As used in UNFCC 2013-2015 Review

Experts observe that cutting CO2 emissions now will affect future warming within a span of few years. To halt temperature rise at any given point will take a net zero global CO2 emissions. In a 2°C scenario aggregate risks of climate change for unique and threatened systems from

extreme weather and events and distribution of impacts will be high. Moreover, for a 2°C limit to be achieved immediate GHG emissions reduction; near zero in medium and negative GHG emission in the second half of the 21st century must be achieved. UNEP underpins that to limit warming to below 2°C requires zero GHG emissions between 2055 and 2070. Even to limit warming to 3°C requires substantial reduction in GHG to zero by 2100.

Additionally, there is need to compensate for past GHG overshooting the target and in consideration that it is impossible to reduce emissions to zero from industries like agriculture. Generally temperature change is as a result of cumulated budget of CO2 and CO2 drives long term warming.

To limit warming to 2°C:

- ✓ Large reduction in global GHG in short/medium term
- ✓ Global carbon neutrality in 2nd half on this century
- ✓ Negative GHG toward end of 21st century
- ✓ Deep decarbonization now and in future not just fine tuning current trends

Climate change risks

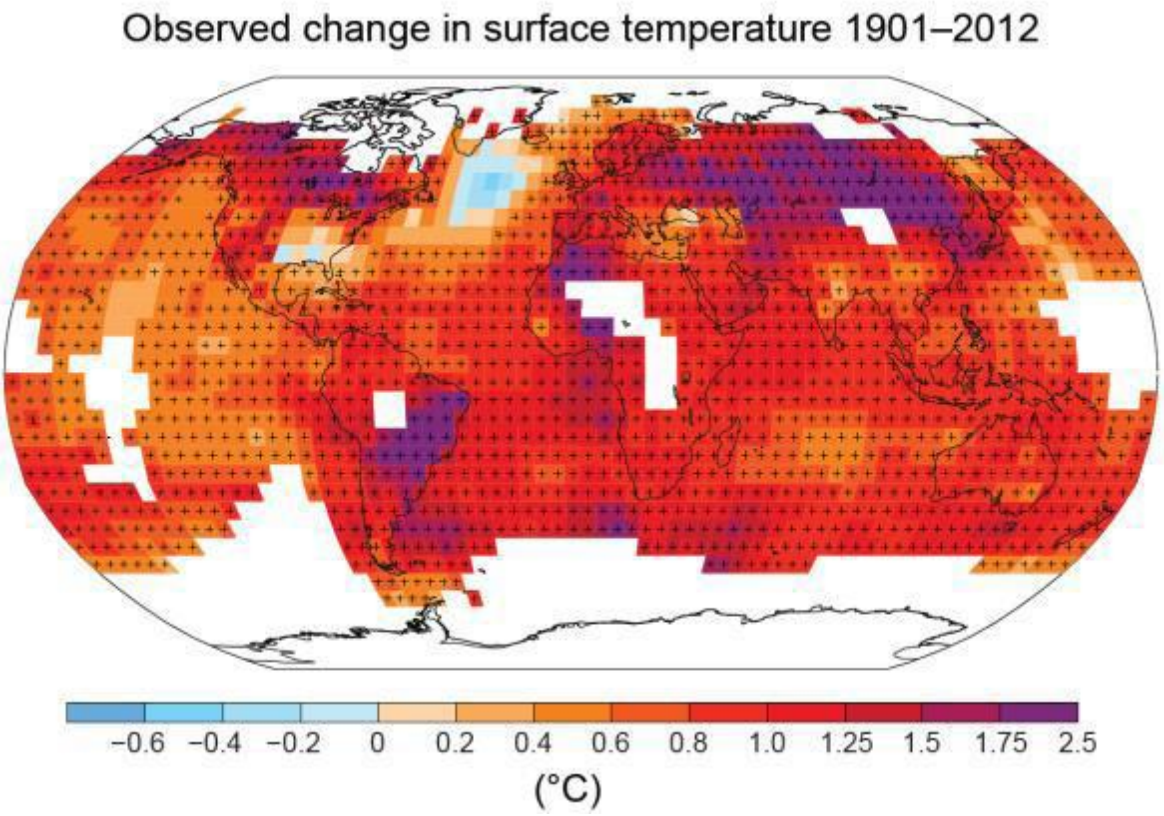
Climate change risks include death, illness, and disrupted health due to flooding, extreme weather events leading to disruptions/breakdown of infrastructure, networks and critical services. In Africa food insecurity and malnutrition persistence; while in Asia, North America and Australia floods, due to exposer and vulnerability; coastal floods and inundation. Europe, Asia, and Australia will experience extreme heat and heat waves.

Ecosystems without adaptive potential like Polar Regions and oceans (corals) will suffer high and higher risks.

0.85°C observed impacts

- ➢ Food production: low wheat/maize yields; negative impacts on marine fisheries and sea level rise and its associated impacts on a low lying coastal zone and small islands.
- ➢ Glacier and ice sheets consistent mass loss and arctic systems.

- Ecosystems: increased tree mortality/forest die back; and negative impact of arctic, fresh water and terrestrial species and warm water coral reefs.
- Sustainable economic development and increased economic losses from extreme weather.



Source: Summary for policymakers in the contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, figure SPM.1(b). Cited in UNFCC 2013-2015 Review

Adaptation potential is limited for many regions dependent on climate sensitive sectors such as ecosystems services and tourism with limited opportunities for economic diversification; observed climate change impacts and implementation of adaptation options if available is quite high compared to national budgets.

Current warming is causing impacts far beyond current adaptive capacity of many people. Reality of such impacts at regional differences is masked by aggregation of risks. Level of risk is

related to the number of causal link from species, individual, village perspective that already faces severe impacts current level of warming is unsafe.

Experts warn that additional warming will increase risk of severe pervasive and irreversible impacts. QUARDAIL concept which implies a warming limit that guarantees full protection from dangerous anthropogenic interference no longer works. Consideration of society acceptable risk of climate impacts.

2°C warming

i. Climate change too rapid for species to move sufficiently fast and migrate to their preferred temperature zones.
ii. Long term sea rise level rise may exceed 1M
iii. Arctic Summer Sea will be at high risk
iv. High risk of ocean acidification and warming leading to mas coral bleaching (high confidence) and deaths.
v. Crop production at high risk with adaptation potential for some crops
vi. Indigenous people at risk of cultural, heritage and land loss
vii. Cultural practices embedded in livelihood will be disrupted due to residual risk that remains with a 2°C temperature rise accompanied by high adaptation.
viii. Unique threatened species will be at high risk due to their limited/ barely adaptive capacity such include arctic se and corals.

Extreme events pose high risk to human health, urban housing and infrastructure. Urban heat and island effect, air pollution and differential vulnerabilities; permanent migration, livelihood struggles and conflict in resources based livelihood such as agriculture and pastoralism.

Risks will be unevenly distributed at all levels of development with disadvantaged people and communities facing greater risks at all levels of development facing greater risks. This will result into shifts from transit poverty to chronic poverty, marginalization and food insecurity.

Experts not that global aggregates often mask the impacts across regions and sectors. Evaluations are incomplete and often do not take account of large scale singular events affecting several sectors at once or other effects. Worth noting is the fact that risk of large scale

singular events such as disintegration of ice sheets in Greenland and Antarctica would be moderate.

4°C Warming

- ✓ Ecosystems risks occur at higher levels
- ✓ Climate change velocity too high for terrestrial and freshwater species to move sufficiently fast
- ✓ Biodiversity loss, extinctions and disruptions of ecosystem services.
- ✓ Risk of ocean acidification and warming high
- ✓ Catch potential for fish significantly reduced
- ✓ Crop production high risk with no adaptation potential
- ✓ Long term sea rise would exceed 1M
- ✓ Arctic summer ice completely lost
- ✓ Some unique systems threatened
- ✓ Risks from extreme weather events would become very high or medium with (forced) high adaptation.
- ✓ Marginalized in terms of socio-economic, cultural, political, and institutionally most at risk.
- ✓ Non-linearity of projected risks as we move from 2-4°C warming especially in water availability, heat extremes, coral reefs bleaching with close to double impact in a 4°C compared to 2°C warming.
- ✓ Even with adaptation residual risks from adverse effects remain
- ✓ Limited prospect for risk reduction in a 4°C warming.
- ✓ At 4°C adaptation potential in case of conflict over land acquisition will decline significantly.
- ✓ Food insecurity in Africa and Asia and malnutrition in Africa and South and Central Asia will be high and very high.
- ✓ Flooding risk will be more widespread in Asia, Central, South and North America.

2°C case- defense line

A. Limiting warming to below 2°C significantly reduces projected high and very high risks of climate impacts corresponding to 4°C warming.
B. This will also allow for greater adaptation potential to reduce risks
   - However, many people and systems with limited adaptive capacity like the poor, disadvantaged will be at high risks such as extreme weather events which will remain high. Adaptation could reduce some risks such as risk to food could be reduced to medium but risk to crop yields and water availability are unevenly distributed.
C. Risks of global aggregated impacts and large scale singular events will become moderate.
   - GUARDRAIL concept in which up to 2°C of warming is considered safe is inadequate and would therefore be seen as upper limit, a defense line that needs to be stringently defended while less warming would be preferable.
D. Risk of climate change significantly reduced if warming is limited to below 2°C but requires deep cuts in GHG emissions; scale up low-carbon technology. This poses substantial technological, economic and institutional challenges especially in energy sector and potentially in land use where mitigation has co-benefits but also risks.
E. AR5 showed that immediate mitigation (by 2030)results into multiple cost-effective mitigation pathways for limiting warming to below 2°C. reduction of CO2 by 3% annually and will require a 90% scale up of low-carbon energy technologies by 2050 compared with 2010. Delayed mitigation will require a more ambitious profile after 2030 characterized by annual rate of CO2 emission reduction of about 6%. This implies a dramatic tripling of low-carbon energy technologies with related significant risks.

Mitigation/Adaptation

Available mitigation costs vary widely but significant impact on GDP growth. Availability of technology has serious effects on mitigation costs; further delays in technology deployment will increase the mitigation cost.

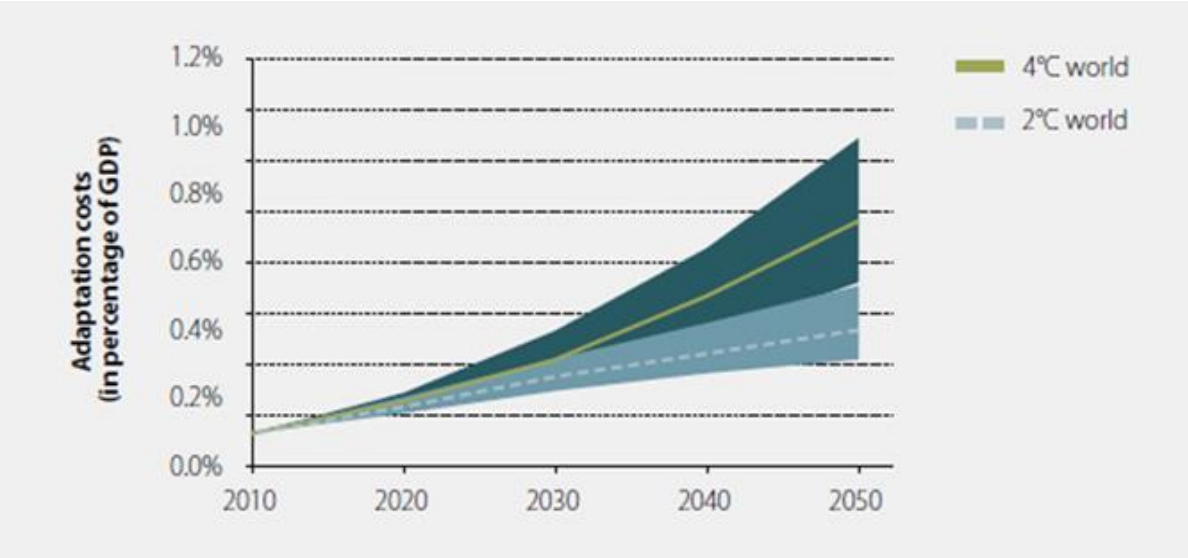
Governments usually focus on non-climate drivers hence there is need for integrated approach where the pursuit of societal needs and objectives are linked with mitigation/adaptation. However present knowledge limits the ability to determine the optimal balance between adaptation and mitigation and residual impact.

Experts point that mitigation costs are manageable even in the absence of consideration of co-benefits of mitigation and policy options can manage the risks of necessary mitigation action. This requires political will and commitment which has largely lacked up to today. It is easy to measure mitigation but often hard to quantify adaptation. Currently GHG emissions has accelerated despite present mitigation efforts where between 2000 and 2010 emissions levels were all time highest. About 50% of cumulative anthropogenic GHG emissions between 1750 and 2010 has occurred in the last 40 years. 50% of this emissions has been absorbed by oceans and terrestrial biospheres.

UNEP & IPCC point that the Cancun agreement commits the planet to a 3°C and not a 2°C warming. Additionally the global share emissions produced by countries with national climate policies rose from 45% to 67%. This is attributed to policy insufficiency to halt and reverse emissions. Emissions caps are lenient and thus suffer price reductions to date. Moreover, market based systems have shown inability to fulfill the targeted environmental integrity. This is the reason why Clean Development (CDM) yields mixed results. Consequently national information is not availed at international platforms like the IPCC and UNFCC on time.

The poor need a strategy that allows to work on mitigation/adaptation and development concurrently while technology transfer is enhanced by institutional arrangements, finance capacity to absorb technology adopted at each region.

Adaptation costs in developing countries.



Source: Slide 5 of the presentation by Mr. Keith Alverson (United Nations Environmental Programme), available at <http://unfccc.int/files/science/workstreams/systematic_observation/application/pdf/141203_sed4_alverson.pdf>. The figure shows that adaptation costs are emissions-dependent. By 2050, adaptation costs could be around twice as high in a 4°C world scenario than they are in a 2°C scenario. Abbreviation: GDP= Gross Domestic Product. As cited in UNFCC 2013-2015 Review

Existing barriers to technology include financial, regulatory, and legal frameworks, technical barriers to development and technology; institutional and organizational barriers; trade barriers impede adoption of technology. Additionally UNEP notes it is difficult to distinguish between adaptation finance and other development and other purposes. Lack of clarity on procedures for applying for funding for the National Adaptation Plans process rendering it inadequate and unpredictable financing hindering further scale-up and mainstreaming of adaptation into national development planning.

The 1.5°C Case

Experts are calling for more stringent target.

- At 2°C most terrestrial and marine species would be able to follow speed of climate change
- 50% of coral reefs may remain
- Sea level rise may be below 1M
- Some arctic ice may remain
- Ocean acidification impacts stay at moderate levels
- More scope of adaptation would exist especially on agriculture sector.
- Significant residual impact especially for sub-Sahara farmers under 1.5°C considering current levels has stretched many way above coping capacities. Reducing warming to below is preferable as this could help control carbon cycle feedbacks and reduce risks from them.

The technology required for the 1.5°C is the same as 2°C scenario but need faster deployments; and energy demand reduced earlier hence higher cost than in 2°C scenario. However some policies and technologies required to limit warming to 1.5°C may negatively impact poverty reduction efforts. Nonetheless impacts are already occurring and risk will increase with temperature increase..

The pathways to limit warming to 1.5°C by end of the century are similar to those limiting to 2°C but call for more immediate mitigation action and scale up of the challenging feature of 2°C scenarios such as scale up CO2 removal technology and full set of low carbon technology.

Conclusion

Effort should be put in place to push defense line as low as possible.

Great miles have been covered in the global climate negotiations under the Convention. However, these negotiations are not on track in achieving the 2°C target largely due to policy failure and lack of political will. Scientific urgency has not been fully heeded and the impacts have begun to show with heat waves exceeding previously known levels, floods and drought becoming intense and frequent.

The Paris Agreement need to revise the target to 1.5°C limit which is scientifically, and socioeconomically sound and presents best of good will to earth and vulnerable populations. Current inadequacies represent a political system that is weak in policy formulation, commitment and enforcement but the climate change challenge is huge and calls for decisive international leadership and sustainable growth.

Reference

UNFCC (March, 2015) Summary report on the fourth session of the structured expert dialogue Lima, Peru, 2–3 December 2014 and Geneva, Switzerland, 8–9 February 2015, The 2013–2015 review, StructuredExpertDialogue.2015.1.SummaryReport