

PLATO Society

After Glasgow: Challenges Confronting the Paris Agreement and Multilateral Climate Action in the 2020's

February 25-April 1, 2022

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March 18th Meeting: Summary

- **Topic: developed country support for developing countries, with emphasis on finance**
 1. **“Developed” and “Developing” countries in the Paris System**
 2. **What is “support”?**
 3. **The \$100B pledge**
 4. **Why provide support?**
 5. **Post-COP26 developments**

Today's Topics:

1. “Adaptation” in the Paris System
2. What is “adaptation”?
3. Climate change impacts
4. Possible solutions to impacts:
evolving views

Adaptation: Introduction

- So far in the course, our focus: the global threat resulting from accumulating excess greenhouse gases in the atmosphere.
- The Paris System therefore seeks mitigation: the reduction and eventual elimination of excess atmospheric GHG's by reducing and eventually eliminating GHG emissions worldwide.

Adaptation Introduction (cont.)

- **But what about the effects of global warming that already have occurred, are occurring, and are projected to occur regardless of the rate of mitigation?**
- **This is a new line of inquiry, which has global, regional, and local dimensions: how to reduce vulnerability to those current and future effects? This line of inquiry is “adaptation”.**
 - **A big part of 2020 Wisconsin Governor’s Climate Change Task Force report**

“Adaptation” in the Paris System

- **One of the System’s three pillars, along with mitigation and finance**
 - **Parties have certain requirements, spelled out in the 2015 Paris Agreement.**
 - **Adaptation often addressed in the 2021 Glasgow Climate Pact**
 - **A new element of significance for the Paris System: the Intergovernmental Panel on Climate Change (IPCC) report on adaptation (2/28/2022)**

Adaptation a Different Focus From Mitigation

- **Mitigation: a global objective (reduction of emissions), with specific collective temperature and emissions reduction targets. All Parties share in the pursuit of this objective.**
- **Adaptation: more individualized and diffuse: all decision-making entities (national, local) have different circumstances and different needs.**
 - **Therefore, must choose solutions from among a range of options**

Adaptation:

Paris System Requirements

- All Parties (individual country duties):
 - Planning: adoption of “National Adaptation Plans”
 - Information sharing: Communications to the U.N. Climate Change Secretariat’s Registry
- Developed Country Parties:
 - Support to developing countries (a collective duty)

IPCC: 2/28/2022

Adaptation Report

- **270 authors; approved by 195 governments**
 - **Overarching theme: the interdependent relationship of nature and human systems**
 - **The second part of a full-scale IPCC “Assessment Report”**
 - **The first “AR” in eight years. Much new evidence; many new conclusions (in part, based on “attribution science”)**

The IPCC

- **An intergovernmental organization**
- **Its purpose: provide policymakers with assessments on the current state of scientific knowledge about climate change**
 - **Does not do original research**

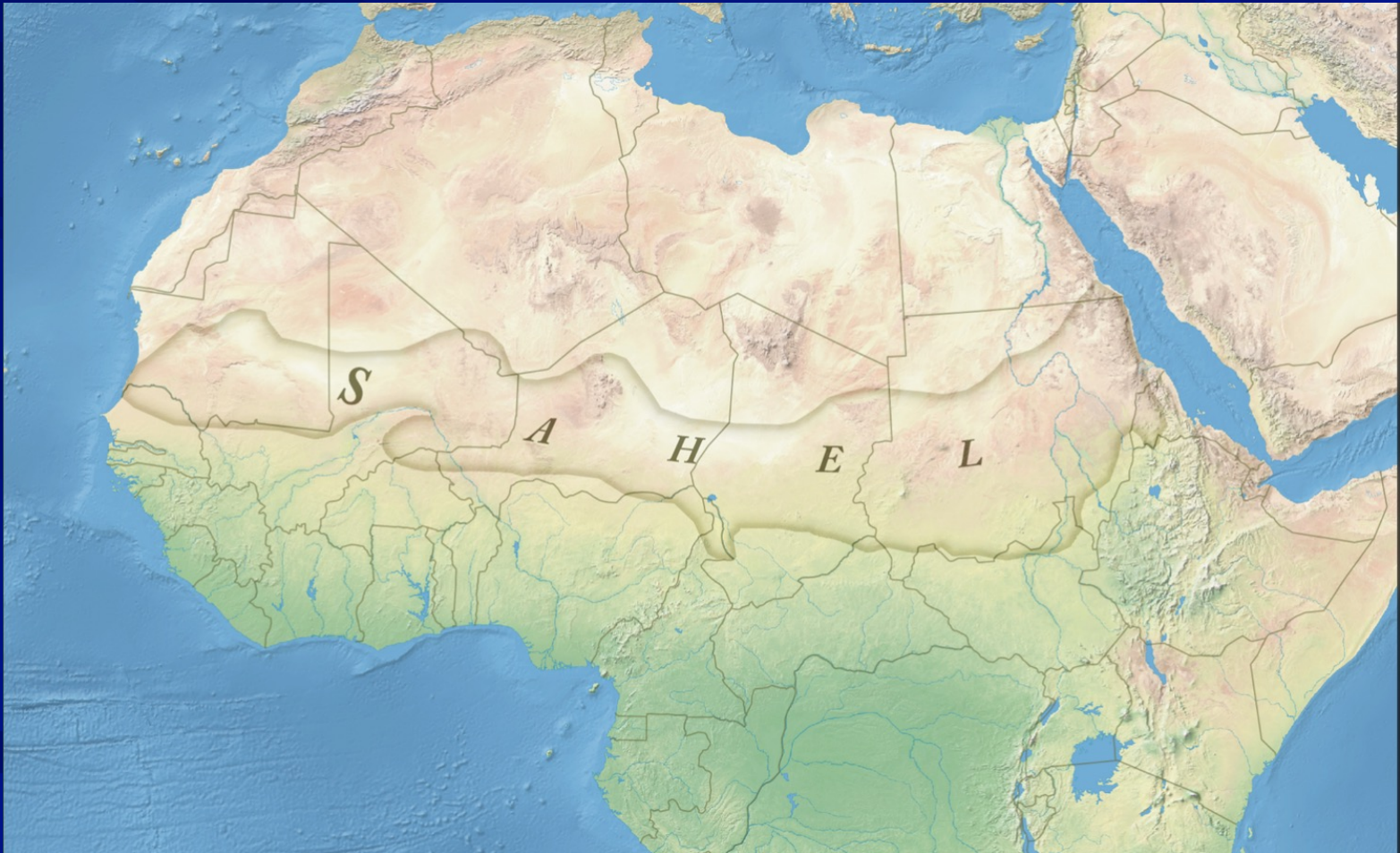
What is “Adaptation”?

- **A process: adjusting to the impacts of climate change**
- **Purpose: reducing vulnerability to climate change**
- **A decision-making process, at all levels of governance (global, national, local)**
- **Two components: impacts and solutions**
- **A recent example of an adaptation action: “Desert to Power Initiative” the Sahel region, north Africa**

The Sahel

- A horizontal semi-arid region south of the Sahara Desert

The Sahel



The Sahel



“Desert to Power” Initiative

- An economic development project led by the African Development Bank (\$380 million)
- Expected to leverage around \$437 million in additional financing from other development finance institutions, commercial banks, and private sector developers.
- Five countries: Burkina Faso, Chad, Mali, Mauritania, Niger (all among the world’s 46 Least Developed Countries)

Desert to Power Initiative

Objective: Clean Electricity

- The objective is: provide electricity to the five countries.
- Build an electricity generation capacity of 10 gigawatts through solar farms and grid distribution systems by 2030.
- Will make the Sahel the world's largest solar production zone and connect 250 million people to clean electricity.

Electricity Generation and Access in the Five Countries

- Currently the level of electricity generation is 35 watts per capita, 4% of the global average
- Chad, for example, has one of the lowest rates of electricity access in the world. Ten percent of the population has reliable electricity and that rate falls to about one percent in rural areas.
- Access in Burkina Faso and Niger: 18% and 19%, respectively

Desert To Power Initiative, the Sahel



The Sahel Initiative: Adaptation, not Mitigation

- Climate change is viewed as an important factor in the intensifying drought conditions in the Sahel.
- Electricity a yardstick of economic development
- Deployment of solar power in the Initiative is adding electricity to the energy mix for the first time, not replacing fossil fuel generation.
- Therefore, an anticipated solution to a climate change impact

The Adaptation Process for Decision-Makers

- In nature, animals and plants engage in adaptation, adjusting to the effects of climate change
- In human systems (including the Paris System), the process has two components:
 - Identification of observed or projected climate impacts (including level of risk they pose)
 - Assessment of solutions: their feasibility and effectiveness

The IPCC's Adaptation Process

- The IPCC's views are expected to shape the ongoing narrative about the adaptation process.
- The IPCC's recent report has these recurring themes:

The IPCCs Adaptation Process: Recurring Themes

- **Relationship of climate, nature, and people**
 - **Emphasis on ecosystems (functional units of living organisms, their non-living environment, and the interactions within and between them)**
- **Crucial importance of biodiversity**
- **The U.N.'s 17 Sustainable Development Goals (adopted 2015, to be achieved by 2030)**

Some of the Sustainable Development Goals

- End poverty and hunger, advance good health and well-being, clean water and sanitation, gender equality, reduced inequalities, decent work and economic growth, affordable clean energy, and climate action
- In sum, goals of economic development, social justice, and environmental protection

The New IPCC Report: Observed and Projected Climate Impacts

- The 2/28/2022 report seeks to provide up-to-date, detailed evidence about observed impacts, as well as projected impacts, on a global scale.
- In overall tone, much more emphatic than the last report (AR5) in 2014.
 - Reflects both observation of increasing impacts around the world and scientific advances.

Adaptation: Impacts of Climate Change

- The 2/28/2022 IPCC report seeks to provide up-to-date, detailed evidence about observed impacts on a global scale.
- In overall tone, much more emphatic than the last report (AR5) in 2014.
 - Reflects both observation of increasing impacts around the world and scientific advances.
- Includes overall impacts, impacts in specific sectors, and impacts in regions

IPCC Report: Findings on Impacts, Overall

- The world is warming. Dangerous climate change and extreme events are increasingly impacting nature and human systems everywhere.
- IPCC: Since the Fifth IPCC Assessment Report, published in 2014, a wider range of impacts can be attributed to climate change.
- The increasing extent and magnitude of impacts are causing severe and widespread disruption in nature and in society

IPCC Report: Findings on Impacts, Overall

- Climate change and increases in extreme weather events are drastically and progressively impacting nature, weakening the structure, functioning and resilience of ecosystems.
- Climate change impacts are expected to intensify with additional warming.
- Climate change has already had diverse adverse impacts on human systems, including on water security and food production, health and well-being, and cities, settlements and infrastructure.

IPCC Report: Findings on Impacts, Overall

- Climate change already has altered terrestrial, freshwater and ocean ecosystems at global scale, with multiple impacts evident at regional and local levels.
- Impacts are evident on ecosystem structure, species geographic ranges and timing of seasonal life cycles (phenology)
- The extent and magnitude of climate change impacts on nature are greater than previously assessed

Observed impacts on ecosystems

- Widespread deterioration of ecosystem structure and function, resilience and natural adaptive capacity, as well as shifts in seasonal timing have occurred, with adverse socioeconomic consequences
- Approximately half of the species assessed globally have shifted toward the poles or on land also to higher elevations
- Hundreds of local losses of species

Observed impacts on ecosystems

- **Some impacts are approaching irreversibility**
 - **For example, the impacts of hydrological changes resulting from the retreat of glaciers, or the changes in some mountain and Arctic ecosystems driven by permafrost thaw**

Observed impacts on food and water security

- **Climate change, including increases in frequency and intensity of extremes, have reduced food and water security, hindering efforts to meet Sustainable Development Goals**
- **Ocean warming and ocean acidification have adversely affected food production from shellfish aquaculture and fisheries**

Fish Pond, Bangladesh: Salinity a Reason for Low Production



Fisherman fishing in local fishponds, where salinity is a key reason for low production.

COURTES

IPCC: Observed Impacts on Food Security

- **Jointly, sudden losses of food production and access to food compounded by decreased diet diversity have increased malnutrition in many communities especially for Indigenous Peoples, small-scale food producers and low-income households, with children, elderly people and pregnant women particularly impacted .**

IPCC: Observed Impacts on Health

- Climate change has adversely affected physical health of people globally and mental health of people in the assessed regions
- In all regions extreme heat events have resulted in human mortality and morbidity

IPCC: Observed Impacts on Health

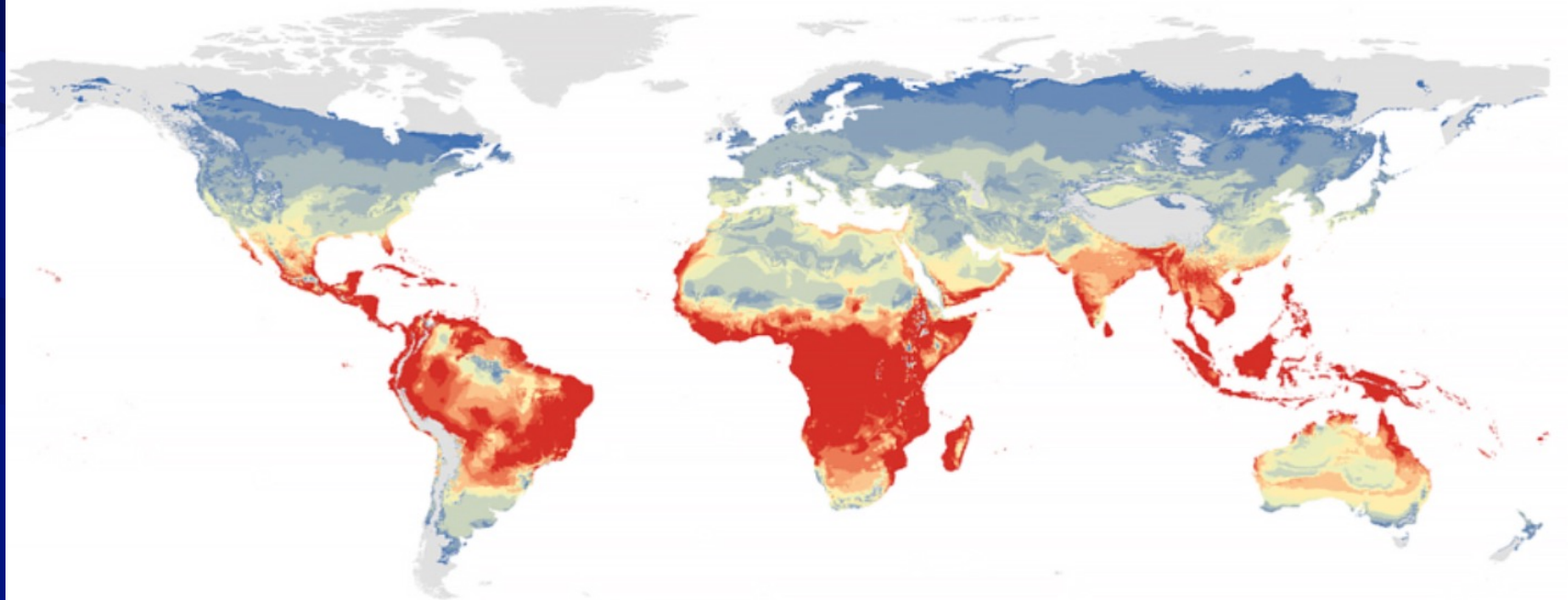
- **The occurrence of climate-related food-borne and water-borne diseases has increased. The incidence of vector-borne diseases has increased from range expansion and/or increased reproduction of disease vectors. Animal and human diseases, including zoonoses (transmitted from animals to humans), are emerging in new areas.**

IPCC: Observed Impacts on Health

- Climate also a driving factor in the spread of a range of diseases. *E.g.*, the range of mosquitoes is expanding as temperatures rise, allowing mosquito-borne diseases, such as dengue fever and malaria, to spread to new areas.

Mosquito Aedes Aegypti in 2080 if GHG emissions do not change

Year 2080



Business as usual

the slider to the left to see predicted range of the mosquito Aedes aegypti in 2080 if there is no change to greenhouse gas emissions. Move the slider to the right to see the mosquito's range if the world exceeds Paris

IPCC: Observed Impacts on Health

- higher temperatures, increased rain and flooding have increased the occurrence of diarrheal diseases, including cholera and other gastrointestinal infections

IPCC: Observed Impacts on Health

- In assessed regions, some mental health challenges are associated with increasing temperatures, trauma from weather and climate extreme events, and loss of livelihoods and culture
- Increased exposure to wildfire smoke, atmospheric dust, and aeroallergens have been associated with climate-sensitive cardiovascular and respiratory distress
- Health services have been disrupted by extreme events such as floods

IPCC: Observed Impacts on Urban Settings

- In urban settings, observed climate change has caused impacts on human health, livelihoods and key infrastructure
- Hot extremes including heatwaves have intensified in cities, where they have also aggravated air pollution events and limited functioning of key infrastructure
- In coastal cities, rising sea levels

Miami, Florida



IPCC: Observed Impacts on Urban Settings

- Concentrated among the economically and socially marginalized urban residents, e.g., in informal settlements
- Infrastructure, including transportation, water, sanitation and energy systems have been compromised by extreme and slow-onset events, with resulting economic losses, disruptions of services and impacts to well-being

IPCC Observed Impacts: Economic Impacts

- Overall adverse economic impacts attributable to climate change, including slow-onset and extreme weather events, have been increasingly identified
- Economic damages from climate change have been detected in climate-exposed sectors, with regional effects to agriculture, forestry, fishery, energy, and tourism, and through outdoor labor productivity

IPCC Observed Impacts: Economic Impacts

- Individual livelihoods have been affected through changes in agricultural productivity, impacts on human health and food security, destruction of homes and infrastructure, and loss of property and income, with adverse effects on gender and social equity

IPCC Observed Impacts: Displacement, Involuntary Migration

- Climate change is contributing to humanitarian crises where climate hazards interact with high vulnerability. Climate and weather extremes are increasingly driving displacement in all regions, with small island countries disproportionately affected
- Through displacement and involuntary migration from extreme weather and climate events, climate change has generated and perpetuated vulnerability

IPCC: Vulnerability

- **Vulnerability of ecosystems and people to climate change differs substantially among and within regions**
- **Approximately 3.3 to 3.6 billion people live in contexts that are highly vulnerable to climate change**
- **A high proportion of species is vulnerable to climate change.**

IPCC: Vulnerability

- **Human and ecosystem vulnerability are interdependent.**
- **Since AR5 (2014), increasing evidence that human degradation and destruction of ecosystems increases the vulnerability of people**
- **Loss of ecosystems and their services has cascading and long-term impacts on people globally, especially for Indigenous Peoples and local communities.**

IPCC: Vulnerability

- **Future human vulnerability will continue to concentrate where the capacities of local and national governments and the private sector are least able to provide infrastructures and basic services.**

IPCC: Complex and Cascading Risks

- **Climate change impacts and risks are becoming increasingly complex and more difficult to manage. Multiple climate hazards will occur simultaneously, and multiple climatic and non-climatic risks will interact, resulting in compounding overall risk and risks cascading across sectors and regions. Some responses to climate change result in new impacts and risks.**

IPCC: Projected Risks

Near-term (to 2040)

- Global warming, reaching 1.5°C in the near-term, would cause unavoidable increases in multiple climate hazards and present multiple risks to ecosystems and humans.
- Level of risk will depend on concurrent near-term trends in vulnerability, level of socioeconomic development and adaptation.
- Near-term actions that limit global warming would substantially reduce projected losses and damages, but cannot eliminate them all.

IPCC: Projected Risks, 2040-2100

- Beyond 2040 and depending on the level of global warming, climate change will lead to numerous risks to natural and human systems. For 127 identified key risks, impacts are up to multiple times higher than currently observed. The magnitude and rate of climate change and associated risks depend strongly on near-term mitigation and adaptation actions.
- Projected adverse impacts will escalate with every increment of global warming

Adaptation: Evaluating Options for Solutions

- **IPCC:** Climate change impacts can be reduced if humans and nature adapt to the changing conditions
- **General questions:** reactive or anticipatory?
incremental and/or transformational?
- **Some impacts are irreversible**

Adaptation: Solutions Will Vary

- Climate change impacts vary in their particulars from region to region, country to country, locality from locality.
- Therefore, in fashioning responses to current or anticipated impacts, policymakers do not have a uniform set of best responses to draw upon.

Perspectives on Solutions are Evolving

- Shift of emphasis on currently identifiable impacts toward “resilience”: building protections against not only current impacts, but also impacts currently unforeseeable
- Expansion of adaptation solutions to include analysis of ecosystems and steps toward “climate resilient development” or “transformational adaptation”

IPCC: New Concept of “Maladaptation”

- Some adaptation steps have been (and have the potential to be) counter-productive
- Risks arise from some responses that are intended to reduce the risks of climate change

IPCC: Maladaptation

- There is increased evidence of maladaptation across many sectors and regions.
- Maladaptive responses to climate change can create lock-ins of vulnerability, exposure and risks that are difficult and expensive to change and exacerbate existing inequalities.

IPCC: Maladaptation (seawalls)

- For example, seawalls effectively reduce impacts to people and assets in the short-term but can also result in lock-ins and increase exposure to climate risks in the long-term unless they are integrated into a long-term adaptive plan

IPCC: Maladaptation

- **Deployment of afforestation of naturally unforested land, or poorly implemented bioenergy (with or without carbon capture and storage) can compound climate-related risks to biodiversity, water and food security, and livelihoods, especially if implemented at large scales, especially in regions with insecure land tenure**

IPCC: Observations on Solutions

- **The goal: feasible and effective measures at all levels**
- **Progress in adaptation planning and implementation has been observed across all sectors and regions, generating multiple benefits**
- **There are feasible and effective adaptation options which can reduce risks to people and nature.**

IPCC: Observations on Solutions

- **Adaptation planning and implementation have continued to increase across all regions.**
- **Growing public and political awareness of climate impacts and risks has resulted in at least 170 countries and many cities including adaptation in their climate policies and planning processes.**

IPCC: Observations on Solutions

- Adaptation to water-related risks and impacts make up the majority of all documented adaptation
- For inland flooding, combinations of non-structural measures like early warning systems and structural measures like levees have reduced loss of lives

IPCC: Observations on Solutions

- **Enhancing natural water retention, e.g., by restoring wetlands and rivers, land use planning such as no build zones or upstream forest management, can further reduce flood risk**

IPCC: Observations on Solutions

- **On-farm water management, water storage, soil moisture conservation and irrigation are some of the most common adaptation responses and provide economic, institutional or ecological benefits and reduce vulnerability**

IPCC: Observations on Solutions

- Irrigation is effective in reducing drought risk and climate impacts in many regions and has several livelihood benefits, but needs appropriate management to avoid potential adverse outcomes, including accelerated depletion of groundwater and other water sources and increased soil salinization
- The effectiveness of most water-related adaptation options to reduce projected risks declines with increasing warming

IPCC: Co-benefits of Adaptation Measures

- Adaptation can generate multiple additional benefits such as improving agricultural productivity, innovation, health and well-being, food security, livelihood, and biodiversity conservation as well as reduction of risks and damages

IPCC: Enabling Conditions for Effective Solutions

- Enabling conditions are key for implementing, accelerating and sustaining adaptation in human systems and ecosystems.
- These include political commitment and follow-through, institutional frameworks, enhanced knowledge on impacts and solutions, mobilization of and access to adequate financial resources, monitoring and evaluation, and inclusive governance processes

IPCC: Enabling Conditions for Effective Solutions

- Enhancing knowledge on risks, impacts, and available adaptation options promotes societal and policy responses.
- A wide range of processes and sources can deepen climate knowledge and sharing, including capacity building at all scales, educational and information programs, using the arts, Indigenous knowledge and local knowledge and citizen science.

IPCC: Enabling Conditions for Effective Solutions

- **Monitoring and evaluation (M&E) of adaptation are critical for tracking progress and enabling effective adaptation**
- **Although most of the monitoring of adaptation is focused towards planning and implementation, the monitoring of outcomes is critical for tracking the effectiveness and progress of adaptation**

IPCC: Enabling Conditions for Effective Solutions

- **Inclusive governance that prioritizes equity and justice in adaptation planning and implementation leads to more effective and sustainable adaptation outcomes**

IPCC: “Climate Resilient Development”

- **Climate resilient development is the process of implementing greenhouse gas mitigation and adaptation measures to support sustainable development.**
- **Climate resilient development integrates adaptation measures and their enabling conditions with mitigation to advance sustainable development for all.**

Summing up Adaptation

- **Presents a multi-faceted set of issues**
- **Major challenges for the Paris System in the 2020's**
- **Among the many questions: how to include many proposed solutions in the accounting for developed country contributions to the \$100B goal?**

Week Six: April 1st

- **Developed country finance:**
 - Support to developing countries for adaptation
 - Payment of “loss and damage”