# The World Adaptation Science Programme (WASP)

# New Climate and Adaptation Science and Implications for Decision Making

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WASP
WORLD ADAPTATION SCIENCE PROGRAMME
making science work for climate adaptation

WORLD METEOROLOGICAL ORGANIZATION

United Nations Climate Change

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INTERGOVERNMENTAL PANEL ON climate change

UN environment programme

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# About WASP

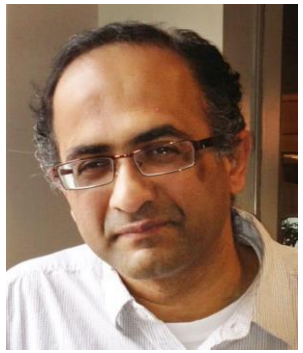
**Ensure that adaptation research gaps are filled,**
focusing on policy-relevant scientific research and
prioritizing research needs in vulnerable developing countries

**Three major components**

Current research gaps

Future research gaps

Policy-relevant guidance



Anand Patwardhan Johanna Nalau Cynthia Rosenzweig

**Co-Chairs Science Committee**

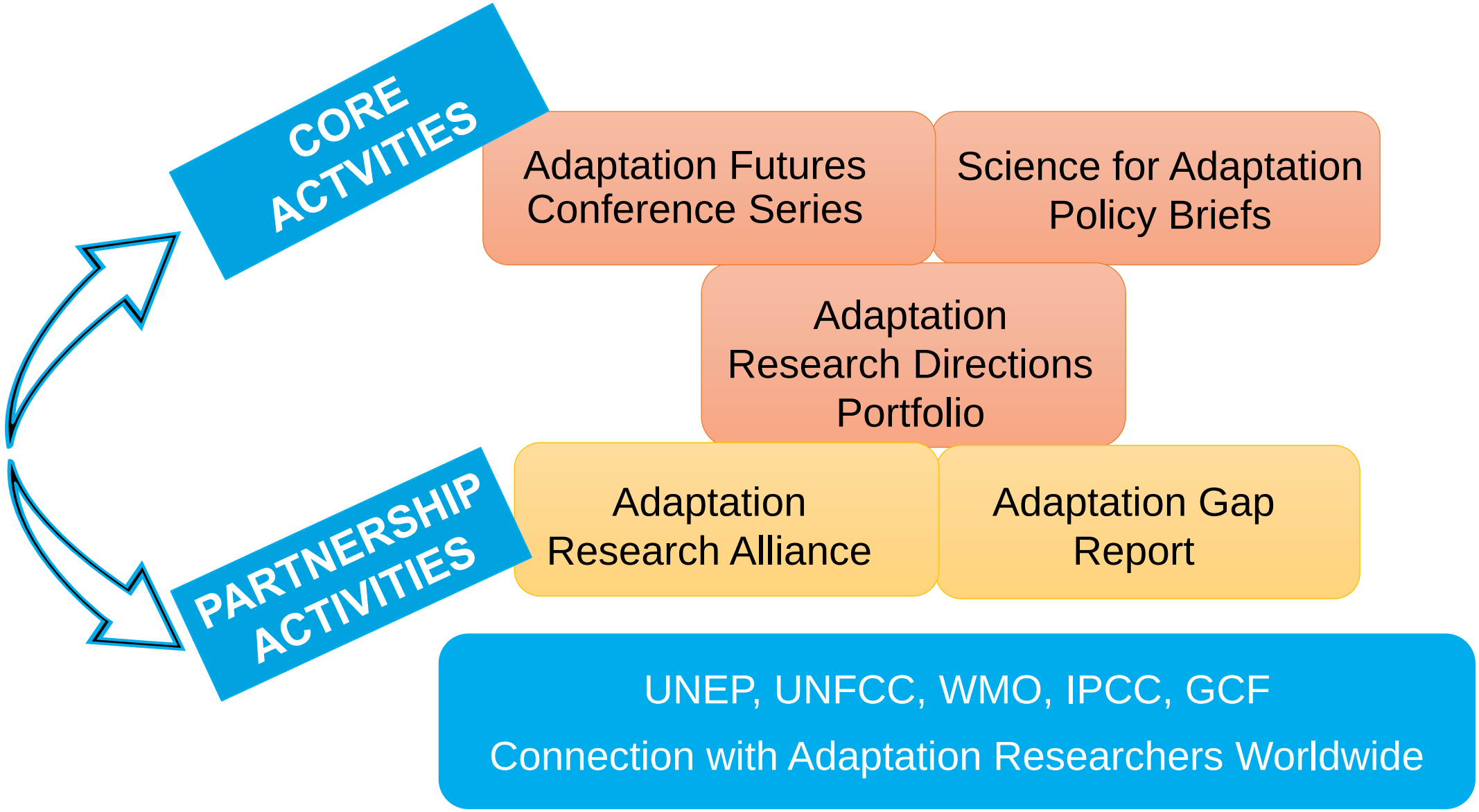
Youssef Nassef

**Chair**


Minpeng Chen Bruce Currie-Alder

**Co-Chairs Policy and Finance Committee**

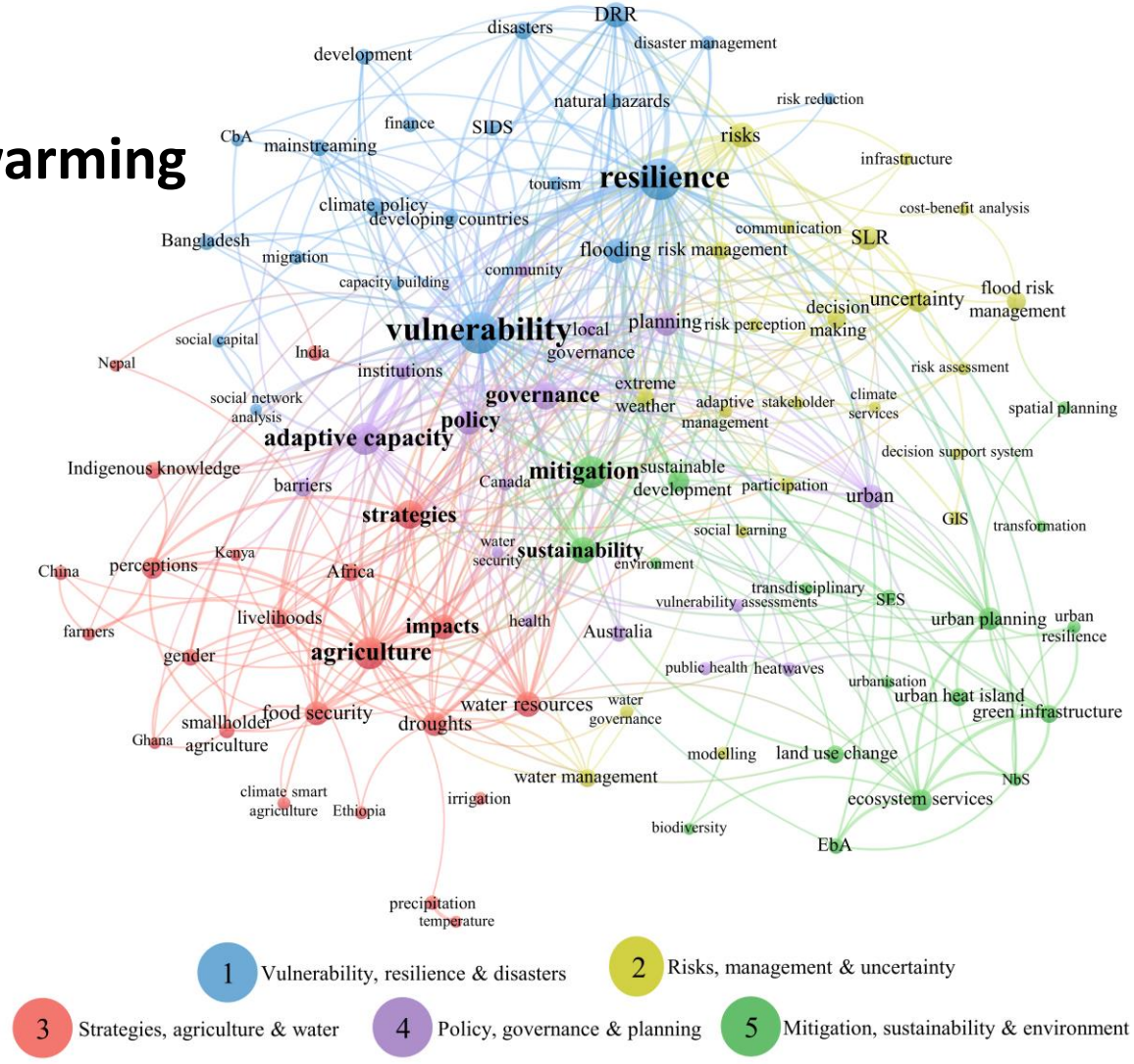
# WASP Core and Partnership Activities



# Climate Science Update

- CMIP6: **Higher climate sensitivity, faster warming**
- Similar **spatial patterns** of projections
- **Benefits of mitigation clear**
- **Responses: Broader range,**

  **covering most policy issues**
- **Urban topics emerging to join rural issues**




Nature, 2019; Tebaldi et al., 2021; Nalau and Verrall, 2021

# Climate Risks and the Most Vulnerable

Adaptation science is consistently focusing on what climate risks mean for the **most vulnerable groups**, considering also the context of sustainable development.

- Current research shows how many climate risk management strategies do not necessarily include the **most marginalised groups**.
- **Differences in vulnerability emerge due to gender, Indigenous, youth, disability, low-income groups,** and influence the extent that individuals and communities can put in place robust responses to climate impacts.
- **Availability and access to finance and information** remain critical for robust decision-making.
- **Vulnerability and risk assessments** play increasingly an important role in informing climate risk decision-making and adaptation.

# Limits to Adaptation

- **Natural and social systems often have significant capacities to adapt**, but it is difficult to establish how this **compares to the rate and magnitude of climate change. There are also biophysical limits to adaptation.**

- Growing concern that changes may not happen incrementally — as a steadily rising line on a graph — but in a **series of lurches as various "tipping points" are passed, e.g., loss of ice sheets, permafrost.**

- **Effectiveness of adaptation limited at higher levels of climate change**, so strong mitigation action is important to ensure the future contribution of adaptation.

- **Potential of adaptation actions** (such as Nature-based Solutions) can best be fully realized by **limiting the risks of dangerous levels of global warming and by scaling up ambition and action.**

# Loss and Damage

- **Institutionalized through Article 8 on Loss and Damage by the UNFCCC** in the Paris Agreement.

- **Five strategic workstreams** by Warsaw International Mechanism for Loss and Damage (WIM): **slow onset events, non-economic losses, comprehensive risk management, human mobility, and action and support**.

- **Emerging evidence on hard and soft adaptation limits in certain systems**.

- **Exploration of financial, technical, and legal support for instances where hard limits are transgressed.**

# Tools

- **Tools available for risk and vulnerability assessments** for communities, biodiversity, and habitats and approaches for risk communication associated with acute and slow-onset extreme events can provide integrated decision support to better prepare and respond.

- Methods for risk communication on climate change countries include **National Adaptation Plans.** Last two decades have seen significant progress in adaptation planning:
  - **72 per cent of countries have at least one national-level planning instrument in place that addresses adaptation**
  - **125 developing countries have begun the process of formulating and implementing National Adaptation Plans (NAPs)**

# Latest Trends in Adaptation Science

- **Cascading Risks** - Interacting stressors and interdependencies affect ability to adapt
- **Multiple Scales**, levels, and actors for decision-making
- **Path Dependency** and **Transformative Adaptation**
- **Understanding Systemic Risk** is needed in addition to community-based adaptation
- **Mapping the evolution and current trends** in climate change adaptation science
  - ***Annual average increase of 28.5%*** in climate change adaptation publications
  - Priority research topics and themes have been dynamic over time, while some ***core concepts (vulnerability, resilience, adaptive capacity) and sectors (water, agriculture) have remained relatively stable.***
  - ***Key challenge*** going forward is how to consolidate this vast research endeavor into a ***more coherent adaptation theory that in turn can better guide science of adaptation and support adaptation policy and practice*** (***Role of WASP: Science for Adaptation***).

# Metrics and Global Stocktake

- Paris Agreement defined a **global adaptation goal and established a Global Stocktake (GST) process** to track collective progress towards this goal.

- **Key information sources**: (1) Formal submissions from UNFCCC parties: Adaptation Communications (ACs), Biennial Transparency Reports (BTRs), National Adaptation Plans (NAPs) and Nationally Determined Contributions (NDCs), (2) IPCC reports, and (3) 'Other' information sources.

- **Challenges**: The lack of clear, specific and universally-agreed definitions of key concepts, large amount of unresolved methodological issues pertaining to the measurement and aggregation of adaptation results, given the significant flexibility available to the information provided and the methodologies used, will be highly variable across countries.

# New WASP Science for Adaptation Policy Briefs

**New Set (available in October, 2021)**

- ***Cascading Shocks and Stressors***
- ***Global Goal on Adaptation***
- ***Early Warning and Forecast Systems for Adaptation***

**First Set (published)**

- ***Adaptation Decision Support Tools and Platforms***
- ***Trans-Boundary Climate Risks and Adaptation***
- ***Adapting to High-End Climate Risks and Adaptation***

# Thank You

# Questions and Discussion

https://wasp-adaptation.org

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