Avoiding Disasters: A Perspective from Climate Change Adaptation Effectiveness and Loss and Damage

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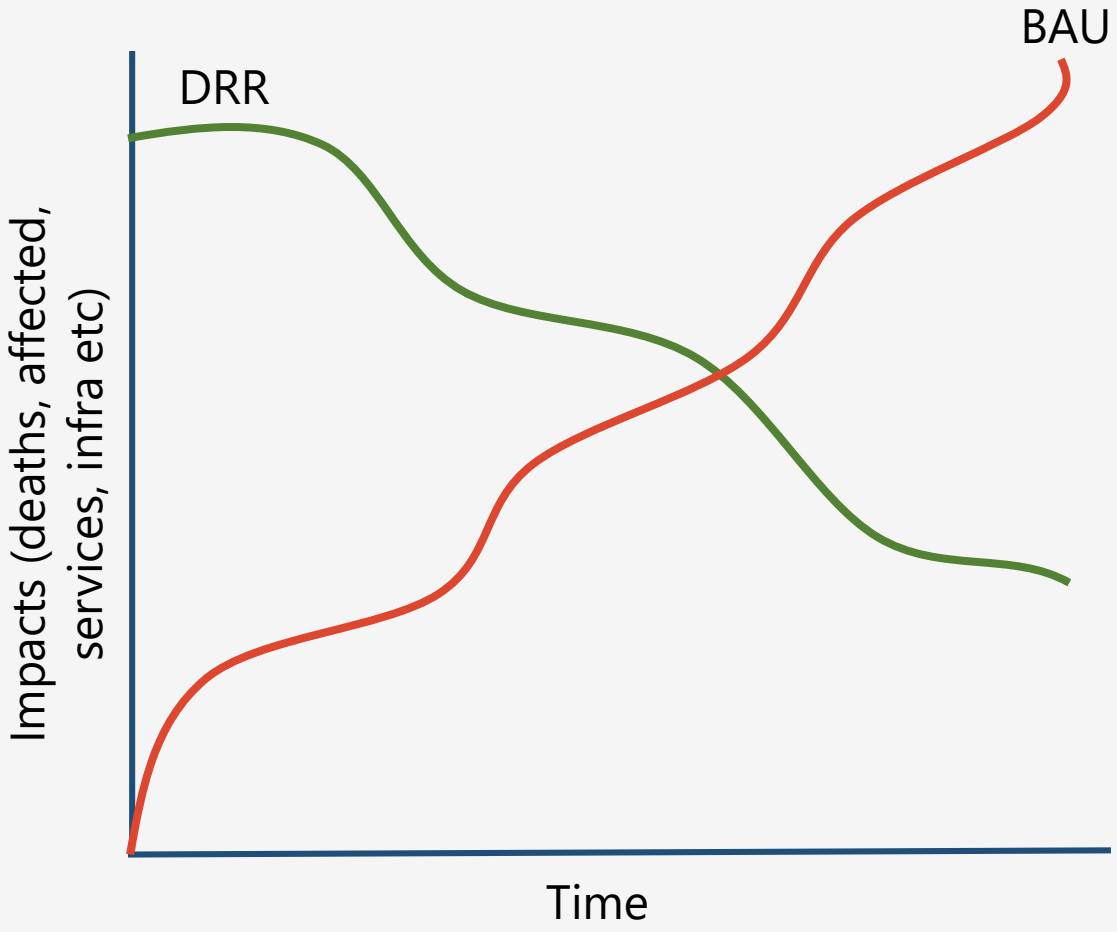
Outline

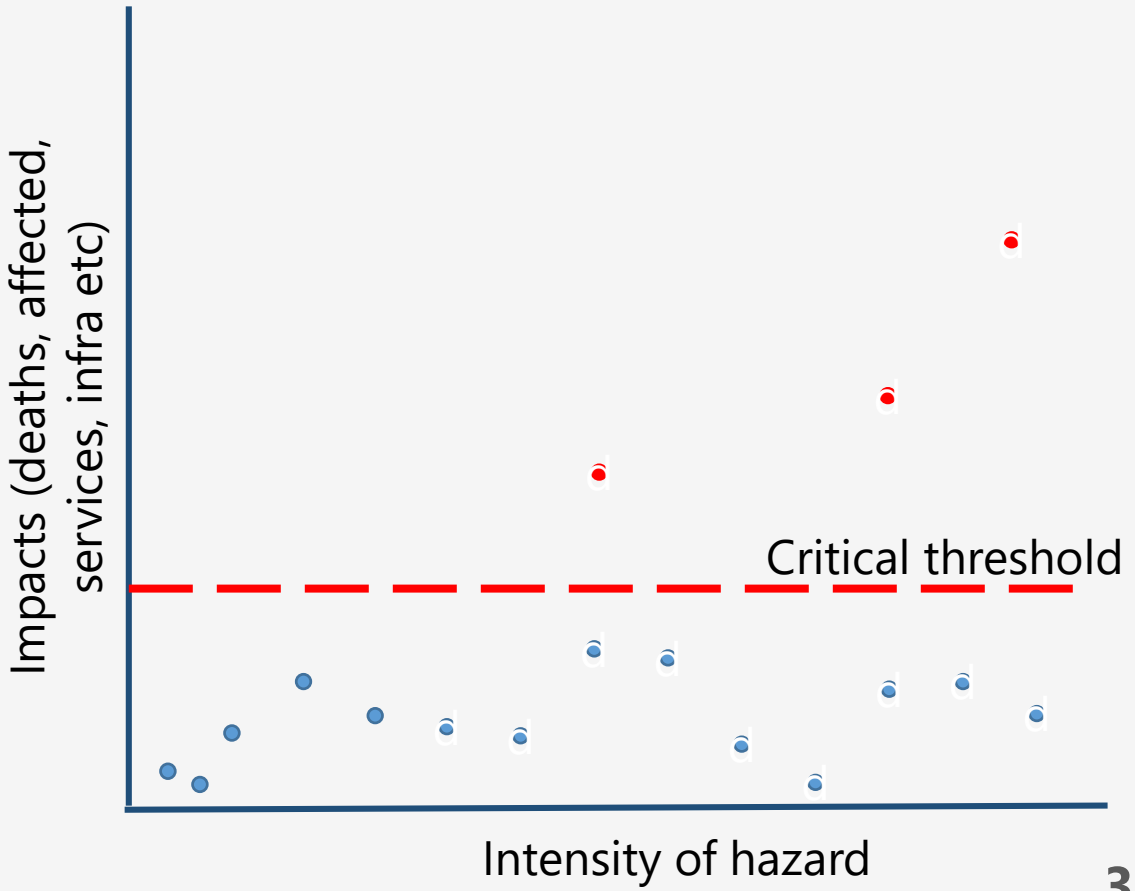
- The mechanics of ‘Avoiding disasters’
- The evidence is hard to come by
- Opportunities for avoiding disasters
  - Addressing loss and damage due to climate change
  - Adaptation effectiveness
- Conclusions

Two Dimensions of Avoiding Disasters Progressive, Aspirational but Ambitious

Disaster avoided over time



Disasters avoided over a range of hazards

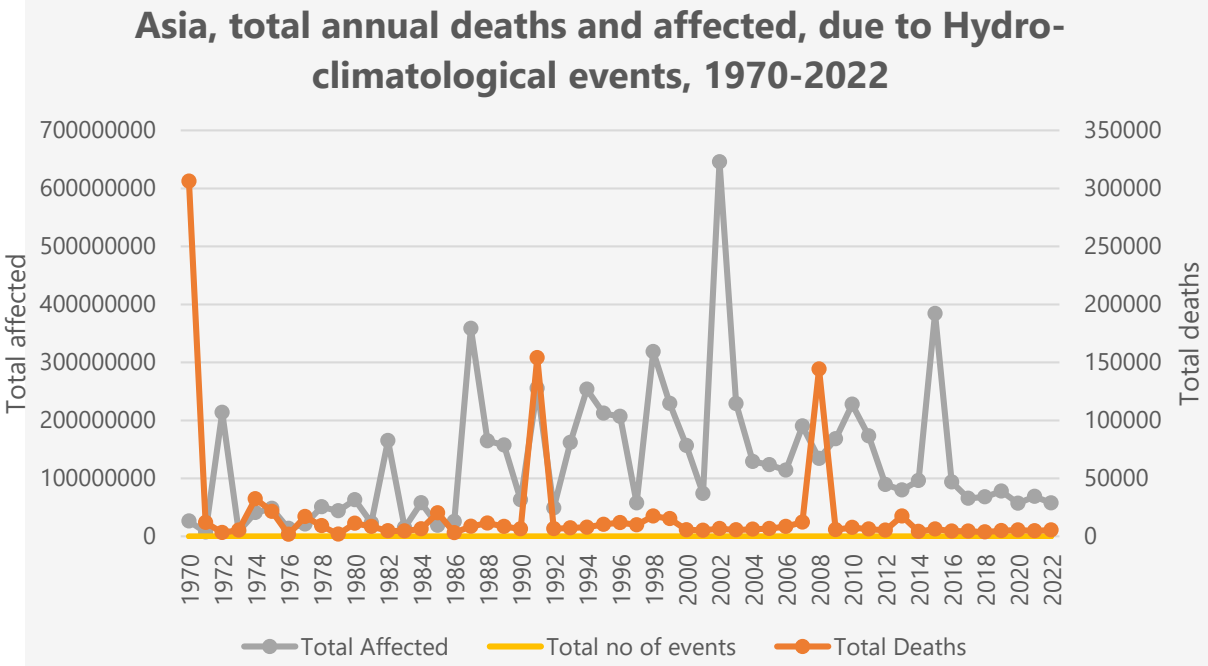


Source: Author

Disasters avoided…

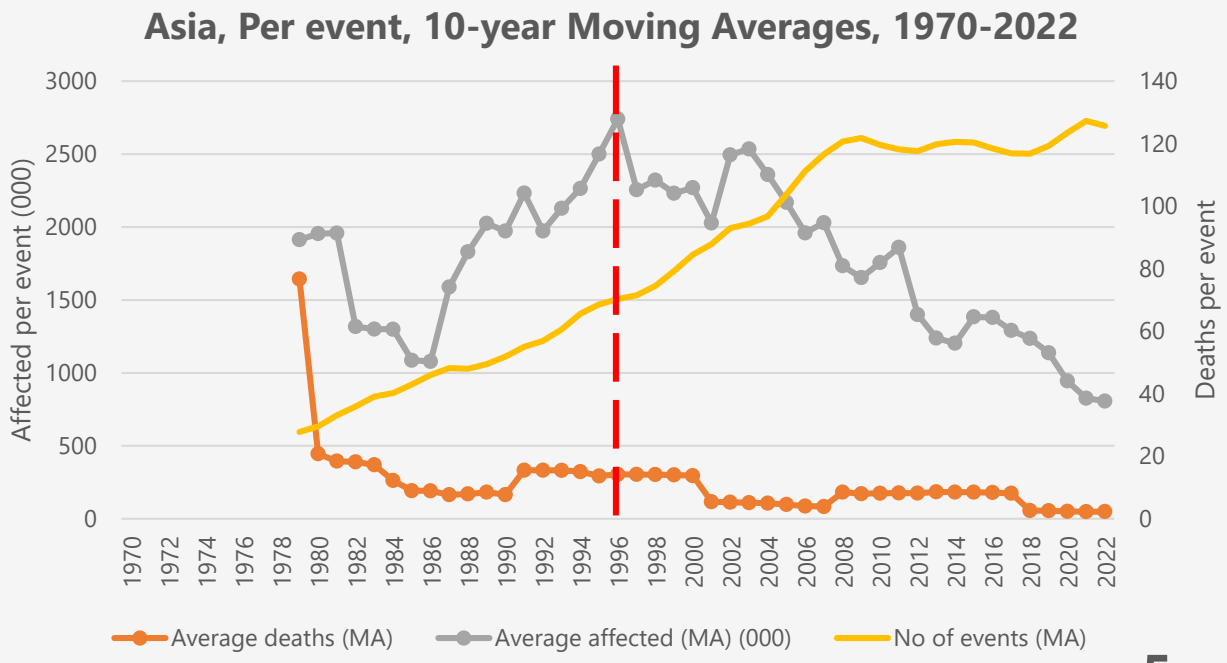
- The understanding presented in the previous slide on disasters avoided is probably possible only in a static world where things do not change over the time.
- However, we are experiencing a global change that includes rapid change in socio-economic and demographic conditions, ambition for a better quality of life, rapid natural resource depletion, environmental degradation etc.
- Climate change is acting as an additional risk multiplier, as it has a constant effect on the baseline conditions. As a result, we are dealing with a baseline condition that is constantly changing over the time.
- **A progressive concept:** As a result, avoiding disasters could be a challenge, and a distant possibility. The goal is aspirational, not impossible in an unlimited resource situation, and ever evolving human capacity is largely under estimated.
- There are three important aspects to consider in the context of disasters avoided:
  - We may have avoided certain disasters but the evidence is hard to come by!
  - Understanding on **climate change adaptation effective**ness is crucial to take the discussion on disasters avoided
  - Understanding on **loss and damages** (residual risks after adaptation) and addressing residual risks is a crucial black box that we are yet to break open

We May have Avoided Certain Disasters and Yet We May Not Know!



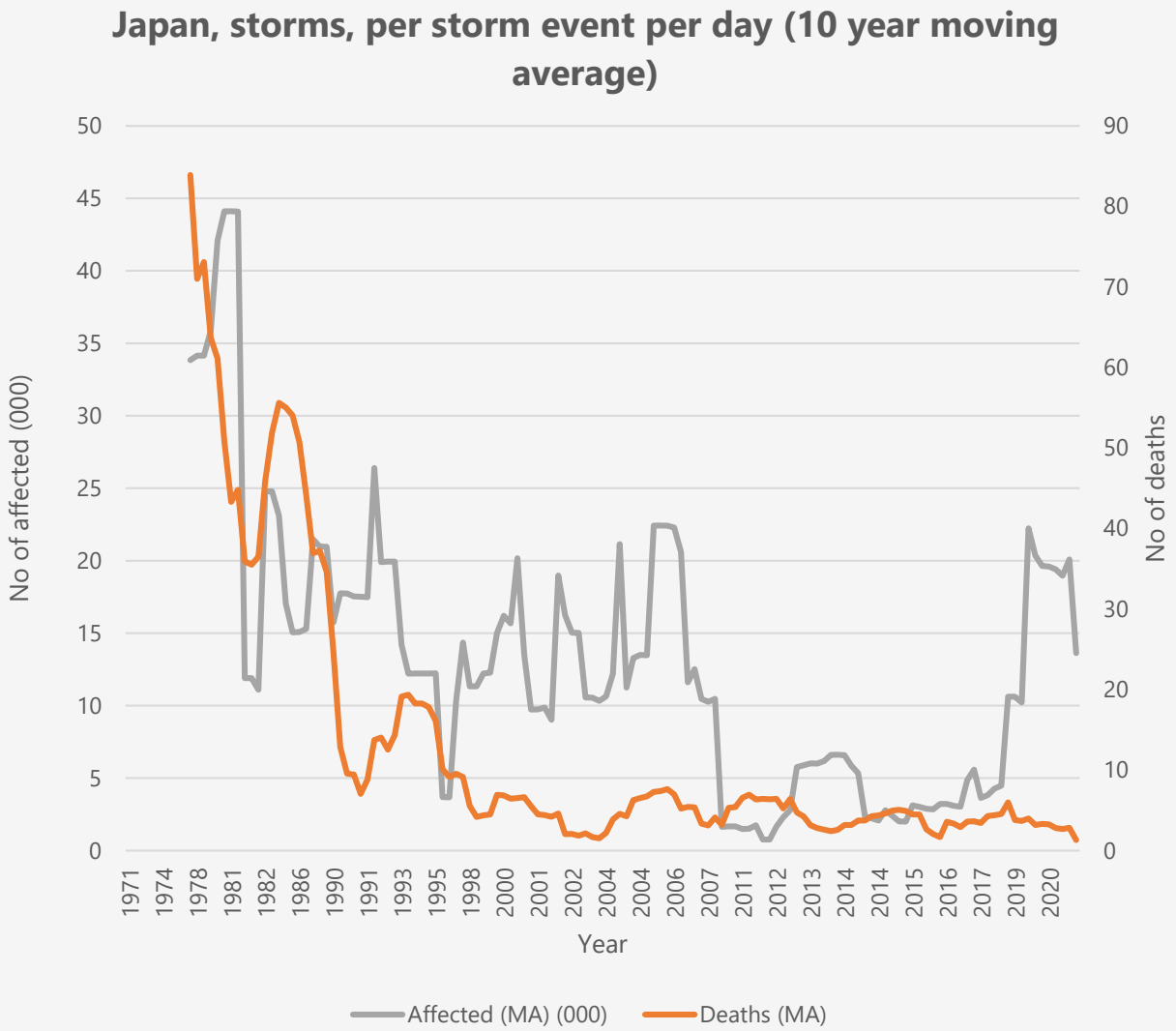
- There is no clear analysis of what kinds of 'disasters' countries have stopped experiencing
- EM-DAT doesn't include hazards only data
- There has been more emphasis on what kinds of events are on the rise.

- Increased emphasis on early warning, preparedness planning and emergency management has drastically reduced the impacts of disasters.
- Evidences are hidden behind the heaps of data



Author, with data from EM-DAT, 2022

Disasters avoided: A case of Japan



- Article 2 of the Disaster Countermeasures Basic Law (1961) defines disasters as follows. “Damage caused by a storm, heavy rain, heavy snow, flood, high tide, earthquake, tsunami, eruption or other abnormal natural phenomenon, large-scale fire or explosion, or any other similar cause stipulated by Cabinet Order in terms of the degree of damage.”
- Japan shows a typical trend of a country that has put tremendous efforts in disaster preparedness and risk reduction.
- This is clearly shown in the trend of number of people affected and dead over the years per storm event per day.
- As a result, we see a significant decline in number of people dead and affected. The variation over time series is related to occurrence of events in various parts of the country with varying population densities etc.
- Today, a typical typhoon of 150 kmph wind speed hardly disrupts public life, public services etc.

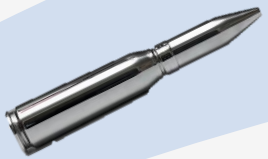
Author, with data from EM-DAT, 2022

Loss and Damages Associated with Climate Change

- Climate change impacts in BAU scenario are projected to grow in the future.
- In non-BAU scenarios, with limited progress in GHG mitigation and adaptation, **adaptation gap is to widen**, the losses and damages associated with climate change are expected to further grow in the future.
- The focus of global efforts on L&D has **moved gradually from recognition of insufficient mitigation and adaptation** efforts, to **enhancing understanding and cooperation** and finally to **action and finance for addressing L&D** in vulnerable countries. This is a positive convergence of stakeholders.
- Loss and damages from climate change occur due to
  - Insufficient GHG mitigation and climate change adaptation efforts.
  - Due to limits to adaptation (hard and soft limits)
  - As a result, there will be residual risks that will remain despite all our efforts

The Solution Space of Loss and Damage

Many silver bullets, not one!



Minimize

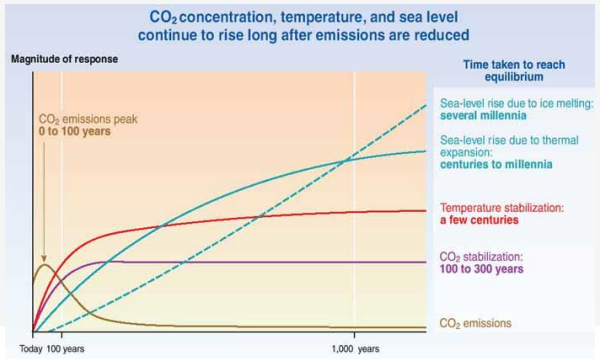
- Most DRR and CCA interventions with immediate to long-term effects

Address (residual risks)

- Interventions for addressing L&Ds, mostly immediate measures

Avert

- GHG mitigation with medium to long-term effects



Source: Author

Actions for Minimizing Loss and Damage (both DRR and CCA)

- Developing robust risk layering approaches (retain, mitigation, avoidance, transfer)
- Risk insurance
- Early warning and forecasting
- Climate risk assessments and adaptation planning
- Biological adaptation (tolerant crop varieties, resistant breeds etc)
- Ecosystems based adaptation (EbA) approaches including recognizing and rewarding ecosystem services
- Planned migration/relocation (including across the boundaries)

Getting the forecast right: Gathering at a *Gion* festival event on a rainy day in Kyoto (17th July 2006)

Actions to Address Loss and Damages (residual risks)

- Actions to address loss and damages (residual risks) is largely through reconciliation, rehabilitation, relief etc.
- We have no reliable estimates of possible magnitude of residual losses and damages and the extent of resources required to address them.

We need reliable L&D estimates to suggest what we can minimize and what we need to address to plan ahead!

Opportunities and Limitations in Addressing L&Ds

- The international and national risk management frameworks provide crucial enabling environment.
- The risk management frameworks at the global and national level have seen significant progress during recent years and there is a **need for synergy and convergence** among these frameworks.
- At the national level, progress within the DRR and CCA spaces means the **ground is well prepared for scaling up** L&D actions. This is where the facilitative role of national policies comes to help.
- **Solutions for NELDs have received the least attention** and this needs to be changed in terms of scientific understanding and the development and deployment of solutions.
- **Our understanding on the effectiveness of actions for minimizing and addressing L&Ds** needs to be improved through appropriate metrics, risk and vulnerability assessments and translation of these into effective implementation on the ground.
- **Mainstreaming L&D actions into national and sub-national adaptation planning** and building upon their synergy with other climate change, DRR and development actions help in **upscaling** in a cost-effective way.

Adaptation Effectiveness

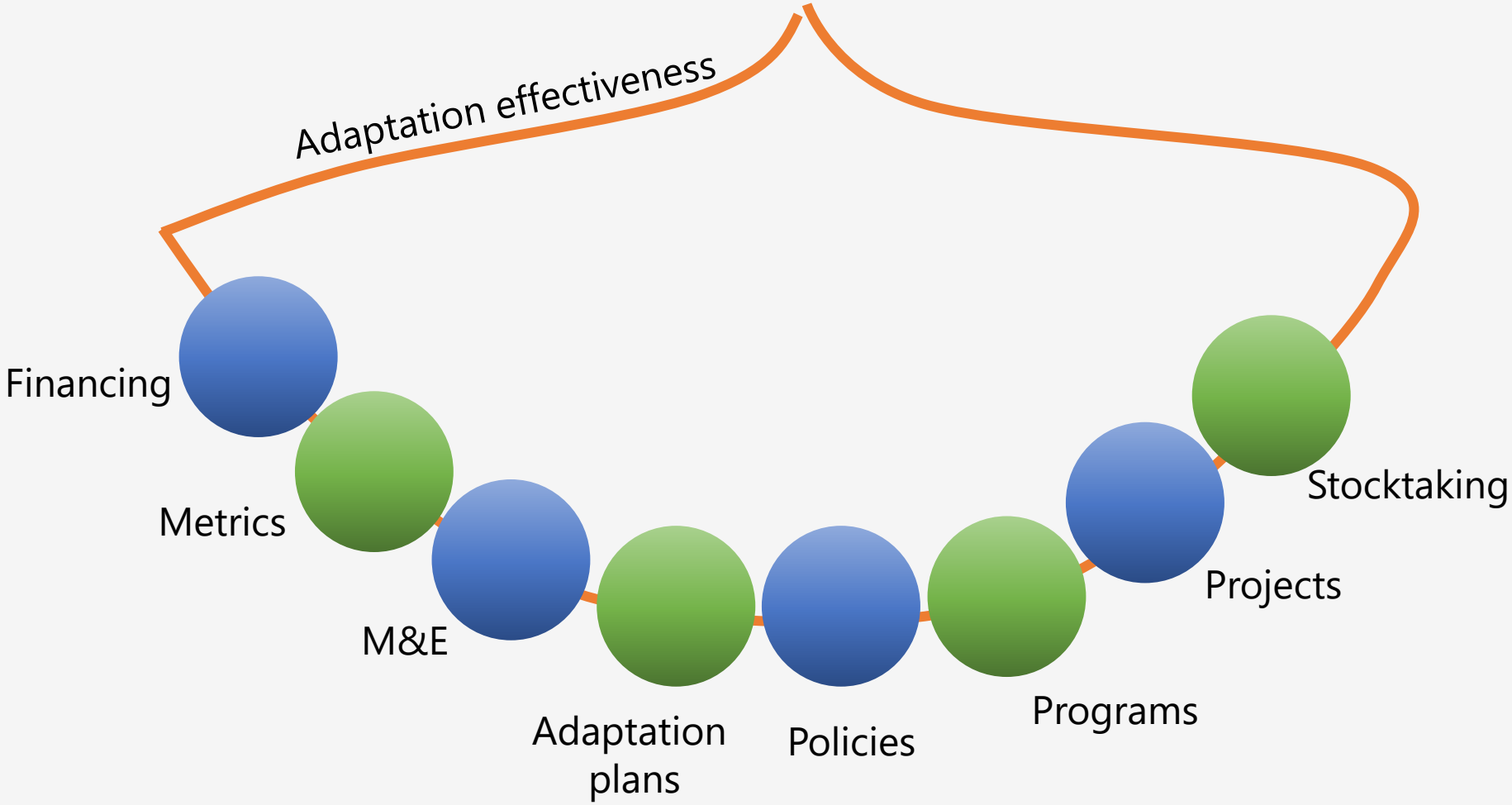
- IPCC Working Group II AR6 defines adaptation effectiveness **as the extent to which an action reduces vulnerability and climate-related risk, increases resilience, and avoids maladaptation**.

- The understanding on adaptation effectiveness evolved over the years. The subsequent emphasis on adaptation effectiveness also included equity, ambition, feasibility aspects.

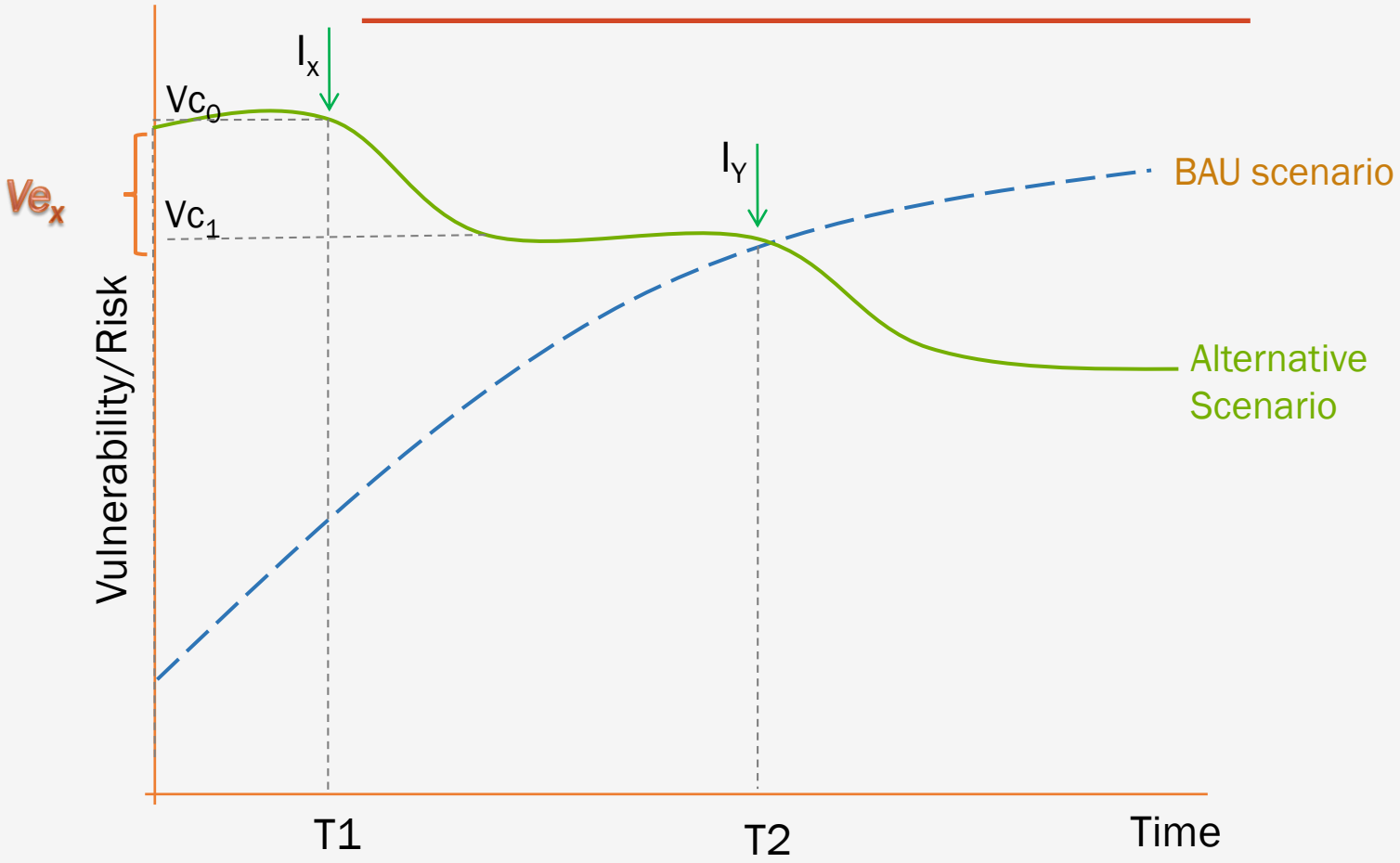
- Adaptation is an ongoing and ever-evolving in nature. Hence defining adaptation effectiveness can be challenging as solutions implemented based on certain knowledge and information at a given time may become ineffective or irrelevant over the time.

- Also, the effectiveness of adaptation policies and individual actions (e.g. projects) could be much different as they both address adaptation at different scales.

Adaptation Effectiveness is the string that connects adaptation efforts from local to national to global levels finally reflecting into global stocktake



Framework for Assessing the Effectiveness of Adaptation Actions



$$Ve_x = Vc_1 - Vc_0$$

Where:
Ve_x: Effectiveness of adaptation action x;
Vc_0, Vc_1: Vulnerability at times T1 and T2
Ix, Iy, Iz: Interventions x, y, z

Source: Author

Adaptation Effectiveness Challenges

1. **Translation of risk assessments into adaptation solutions** is an area that needs improvement. Currently, risk assessments are well developed for engineering oriented and technical solutions and in areas such as water resources and agriculture where the response of solutions to known stress/hazard (flood duration or intensity) are well known and where vulnerability function curves can be well developed based on either technical studies or by expert judgement.
2. Measuring the **non-economic aspects of effectiveness** is also an area that needs improvements. Areas such as biodiversity and ecosystem services have contributed to addressing a part of the problem.
3. Areas such as **social capital, social justice, equity** etc implications of measures at project level is still largely not well developed. Experiences from CBA and LLA have potential to address issues in this area.

Conclusions

- To further the cause of disasters avoided, we need to clearly define a ‘disaster event’ and ‘avoiding disaster’ that can inform (DRR and or CCA) actions.
- The same applies to the definitions for adaptation effectiveness and loss and damage.
- With clear guidance on tools and methods for assessing the adaptation effectiveness of interventions and loss and damage, we will be able to formulate our strategies that can get us close to avoiding disasters.

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