



# Scientific and Technical Advisory Panel

Report to the 57th  
Meeting of the GEF  
Council

# STAP Panel Members and Advisers

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**Thomas Lovejoy**  
*Adviser to Chair*



**Rosina Bierbaum**  
*Chair*



**Mark Stafford Smith**  
*Adviser to Chair*



**Saleem Ali**  
*Climate Change  
Mitigation*



**Rosie Cooney**  
*Biodiversity*



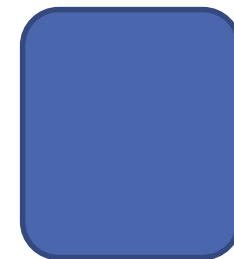
**Jamidu Katima**  
*Chemicals & Waste*



**Graciela Metternicht**  
*Land Degradation*



**Blake Ratner**  
*International Waters*



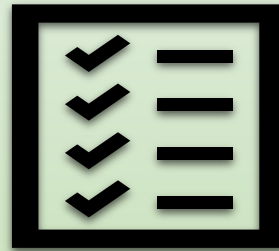
*Climate Change  
Adaptation*



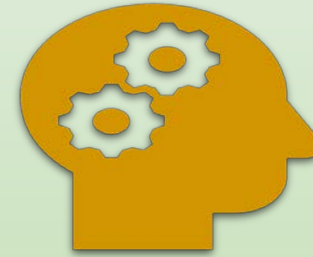
**New Science**



**STAP's work on:  
Impact  
Programs,  
Climate Risk  
Assessment, and  
Durability**



**STAP work  
program**



**GEF 8**



**Observations  
from GEF work  
program**



**NEW SCIENCE**



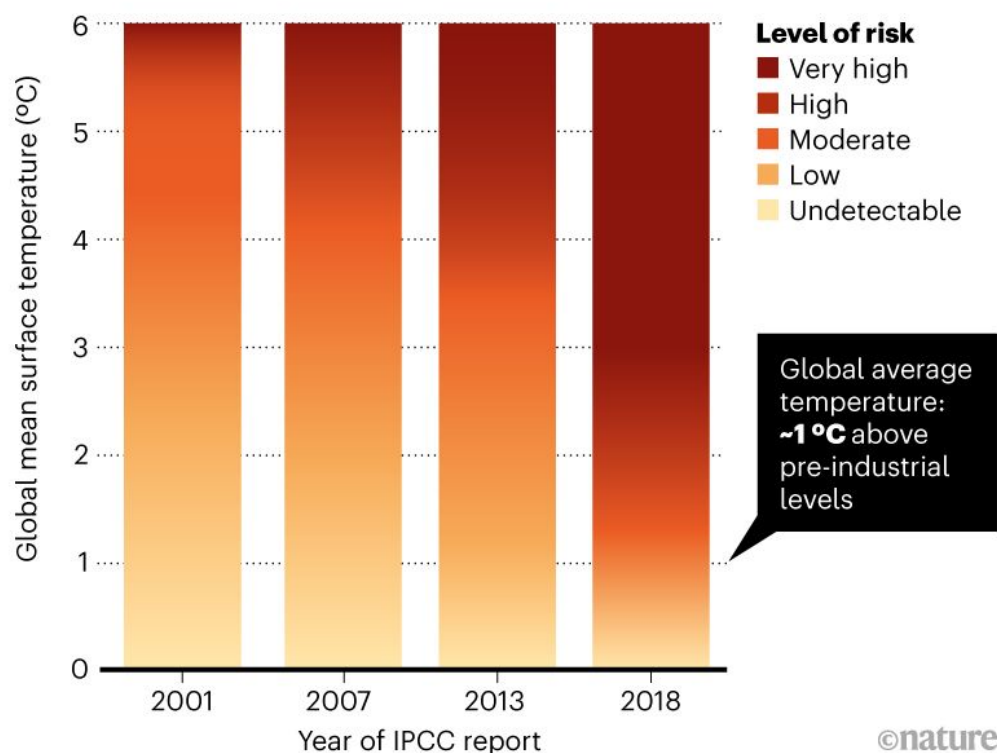




# Abrupt and irreversible changes in the climate system

## TOO CLOSE FOR COMFORT

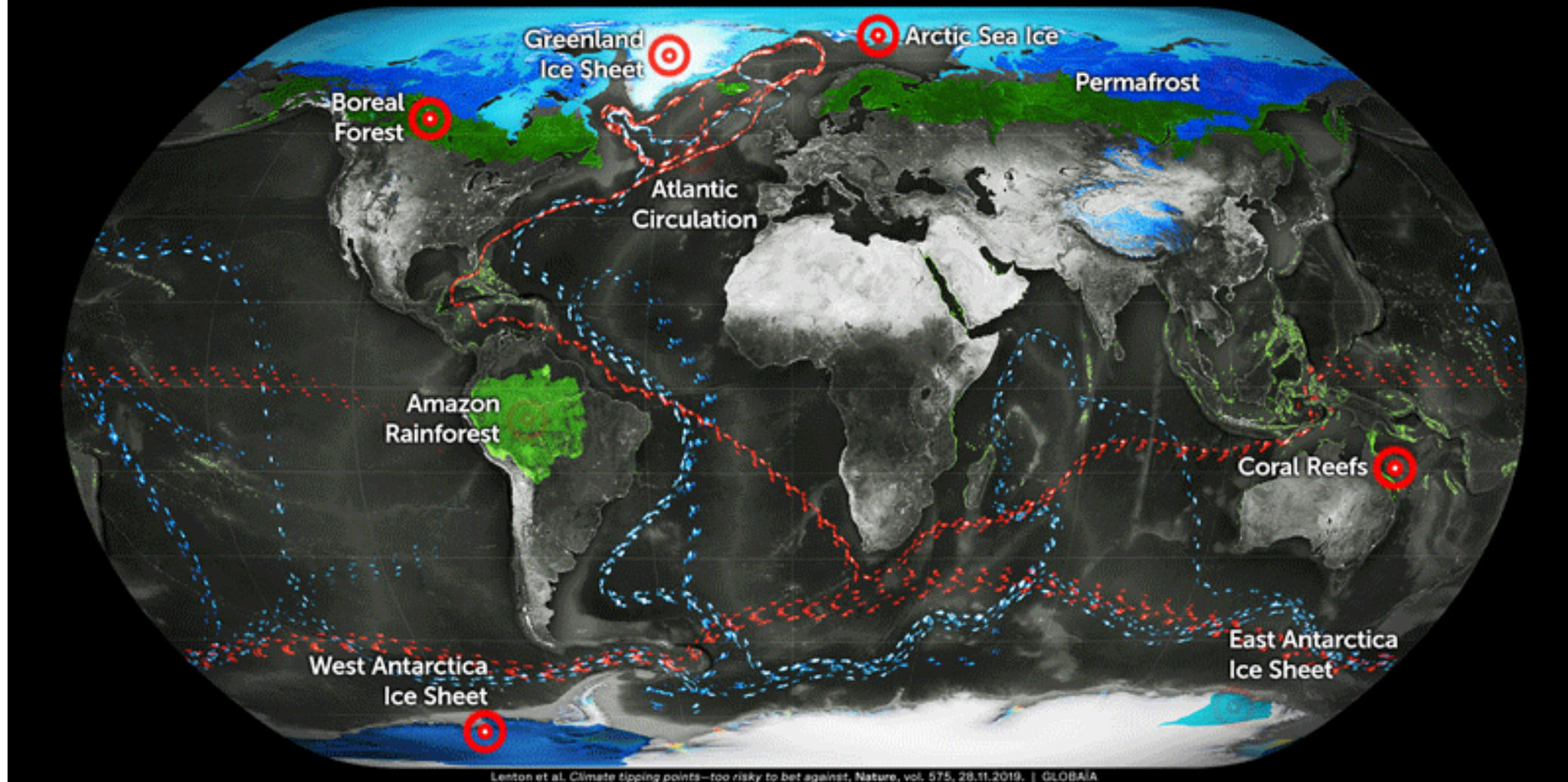
Abrupt and irreversible changes in the climate system have become a higher risk at lower global average temperatures.



IPCC's reports "Global Warming of 1.5 °C" and "Special Report on the Ocean and Cryosphere in a Changing Climate" suggests that tipping points could be exceeded even between 1 and 2 °C of warming

# Earth's Sleeping Giants Stirring

9 TIPPING ELEMENTS NOW ACTIVE



Lenton et al. Climate tipping points—too risky to bet against, *Nature*, vol. 575, 28.11.2019. | GLOBAIA

# UNEP Emissions Gap Report 2019

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“...unless global greenhouse gas emissions fall by **7.6 per cent each year** between 2020 and 2030, the world will miss the opportunity to get on track towards the 1.5 °C temperature goal of the Paris Agreement.”





# Emissions Gap Report - questions

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- What is the trend in global GHG emissions?

Global emissions continue to rise and show no signs of peaking

- What will the current NDCs contribute?

Not enough – in 2030, global emissions must be **25 GtCO<sub>2</sub>e/year** (for 1.5 °C but will likely be more than twice that

- Will this be sufficient to stay well below 2 °C and pursue 1.5 °C?

NO - without more ambition the likely global average temperature increase will be 3.0 °C or more by the end of the century

- Can the 2030 Gap be bridged - and how?

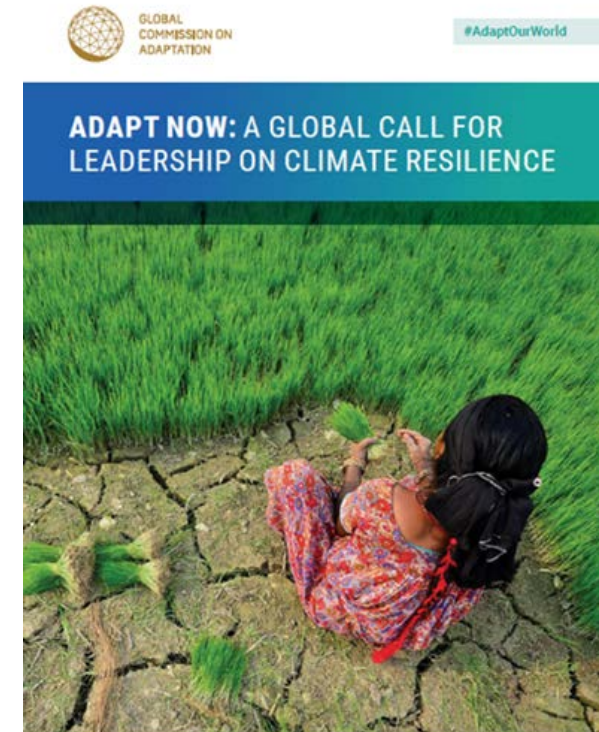
Pursue transformational change; decarbonize power systems; electrify transport; and, improve energy efficiency

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# Global Commission on Adaptation

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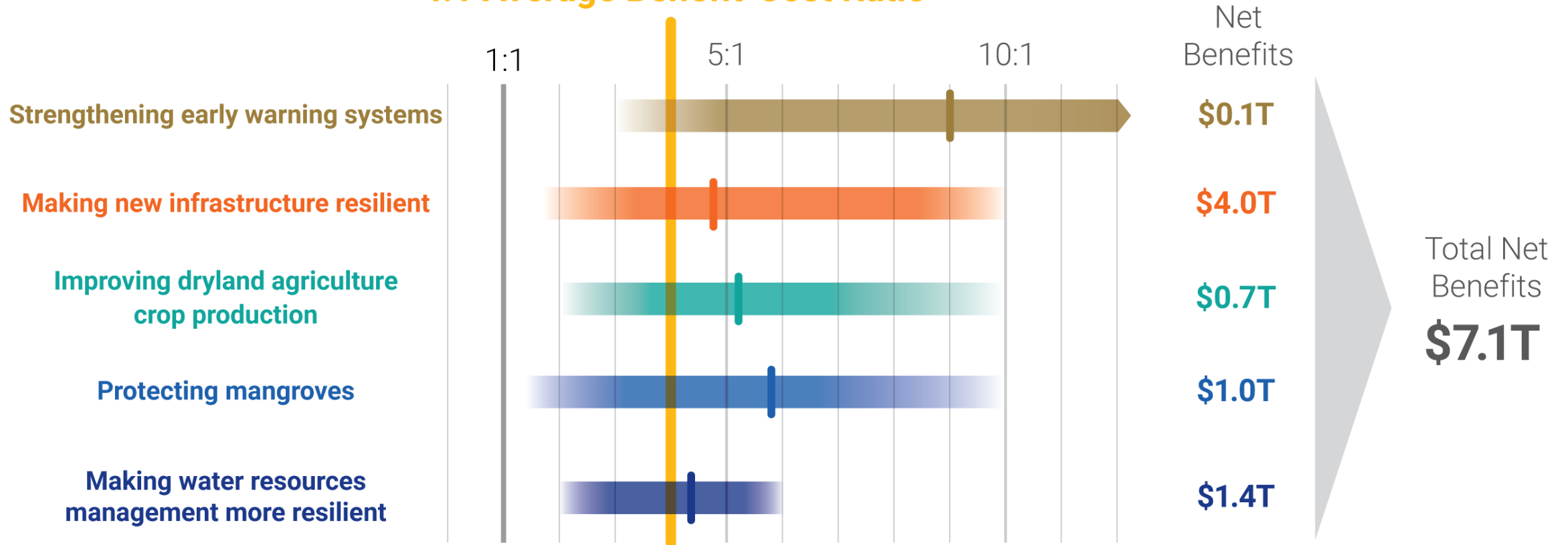
- 100 million additional people fall into poverty
- Agriculture yields fall by up to 30%
- 5 billion lack predictable water resources
- More than \$1 trillion/yr in costs to coastal cities





# Climate Adaptation Delivers High Returns

4:1 Average Benefit-Cost Ratio



Nature-based Solutions offer great co-benefits, lower cost

# How could GEF leverage other financial flows to achieve GEBs?

Additional thoughts from Global Commission on Adaptation

(e.g., Social Protection background paper)

- Social protection schemes are growing globally, and work
- ~USD 32 trillion spent annually
- Already boosts climate resilience – but could do it much better if *aligned* with climate adaptation efforts
- Example: the Kenyan Hunger Safety Net Programme (HSNP)
  - When an El Niño forecast predicted heavy rains/flood, made payments to those likely to be affected in advance
  - Helped manage climate risks

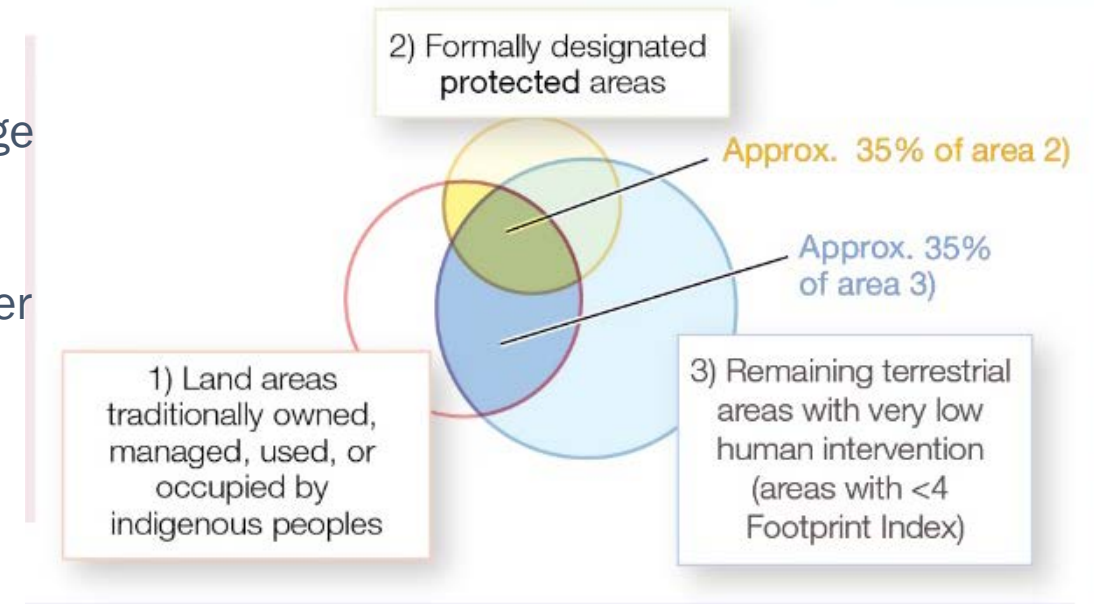


# Indigenous Peoples & Local Communities in Conserving Biodiversity & Ecosystem Services



- IPLCs among hardest hit by biodiversity loss and climate change
- IPLCs are central to conservation efforts – lands are crucial but under increasing threat
- Strengthened tenure, rights, co-management, capacity

## IPBES Global Assessment Findings:



➔ Welcome GEF's new Inclusive Conservation program



**STAP'S WORK ON:  
IMPACT PROGRAMS,  
CLIMATE RISK  
ASSESSMENT, AND  
DURABILITY**



6 STAP criteria  
to promote  
innovation,  
integration, and  
transformation



Innovation



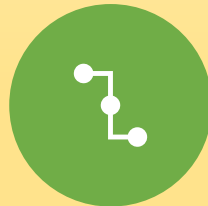
Barriers and enablers to  
transformation



Maximize GEBs, manage  
trade-offs, including  
climate risk



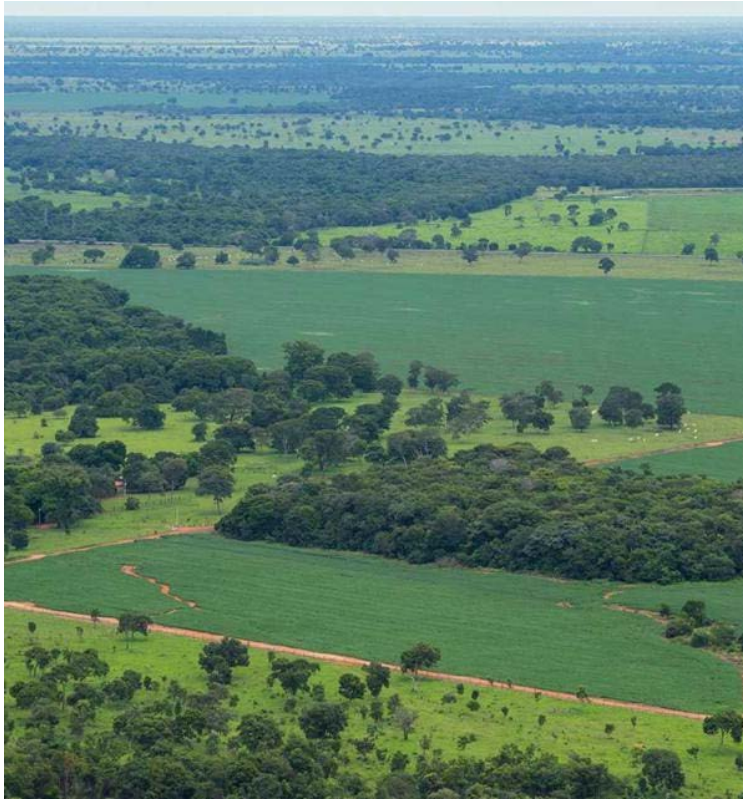
Multi-stakeholder  
processes



Theory of change



Monitoring, evaluation,  
learning, and knowledge  
management



**FOLUR**  
**August 2019**  
**Washington, D.C.**



**Drylands**  
**September 2019**  
**New Delhi, India**



**Sustainable Cities**  
**September 2019**  
**Washington, D.C. and**  
**São Paulo, Brazil**

# Climate risk assessment

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- STAP session at GEF Agency retreat, September 2019
- IPCC recommends 4 steps in a climate risk assessment



GEF Agency Retreat, October 1-3, 2019, Rosina Bierbaum (STAP) with Margarita Astralaga (IFAD)





# Climate risk assessment

- Recently, the agencies were asked:
  - What method or tool does your agency use to assess climate risk for GEF projects?
  - Does this meet the requirements of the four-step process set out in STAP's guidance on climate risk assessment?
  - Is this sufficient to answer the questions on climate risk in STAP's guidelines for screening GEF projects?





# Agency answers:

## Climate risk assessment

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- Q1: 6 agencies had specific tools and methods. 4 had screening processes which highlighted climate risk
- Q2: All of these 10 agencies appeared to have a process which met the requirements of the 4-step process
- Q3: 6 agencies reported that their process was sufficient to answer the questions on climate risk in STAP's screening guidelines
- Conclusion: progress being made, some more to do
- Next steps: STAP will report further in June 2020

# Durability

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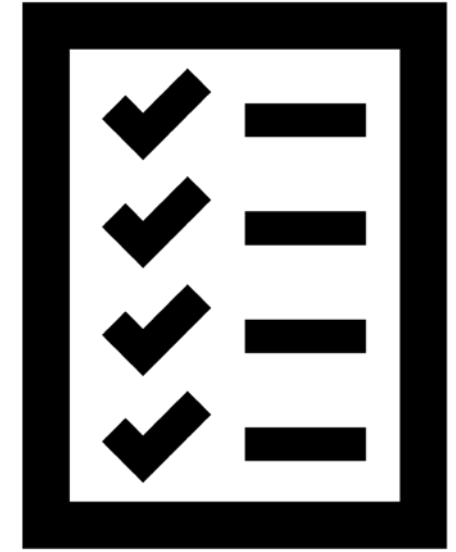
- Session at GEF agency retreat in September 2019
- Durability themes:
  - Engaging the right stakeholders
  - Building the incentives to act
  - Incorporating diversity and flexibility into project design and implementation
  - Underpinned it all by **systems thinking!**
- STAP looks forward to improving how durability principles are embedded in GEF projects



Durability panel GEF Agency Retreat, October 2019:  
Chris Warner (WB), Rosina Bierbaum (STAP);  
Sébastien Delahaye (IUCN); Jessie Smee (UNDP)



# STAP's work program



# Theory of Change

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- The STAP primer is intended to help project developers produce better interventions and achieve enduring impact
- The primer explains:
  - How to develop a Theory of Change?
  - Why do a Theory of Change?
  - When to do a Theory of Change?
  - How to assess a Theory of Change?



<https://knowledge.hivos.org/gender-and-theories-change>

A good Theory of Change should be: plausible, feasible, and testable

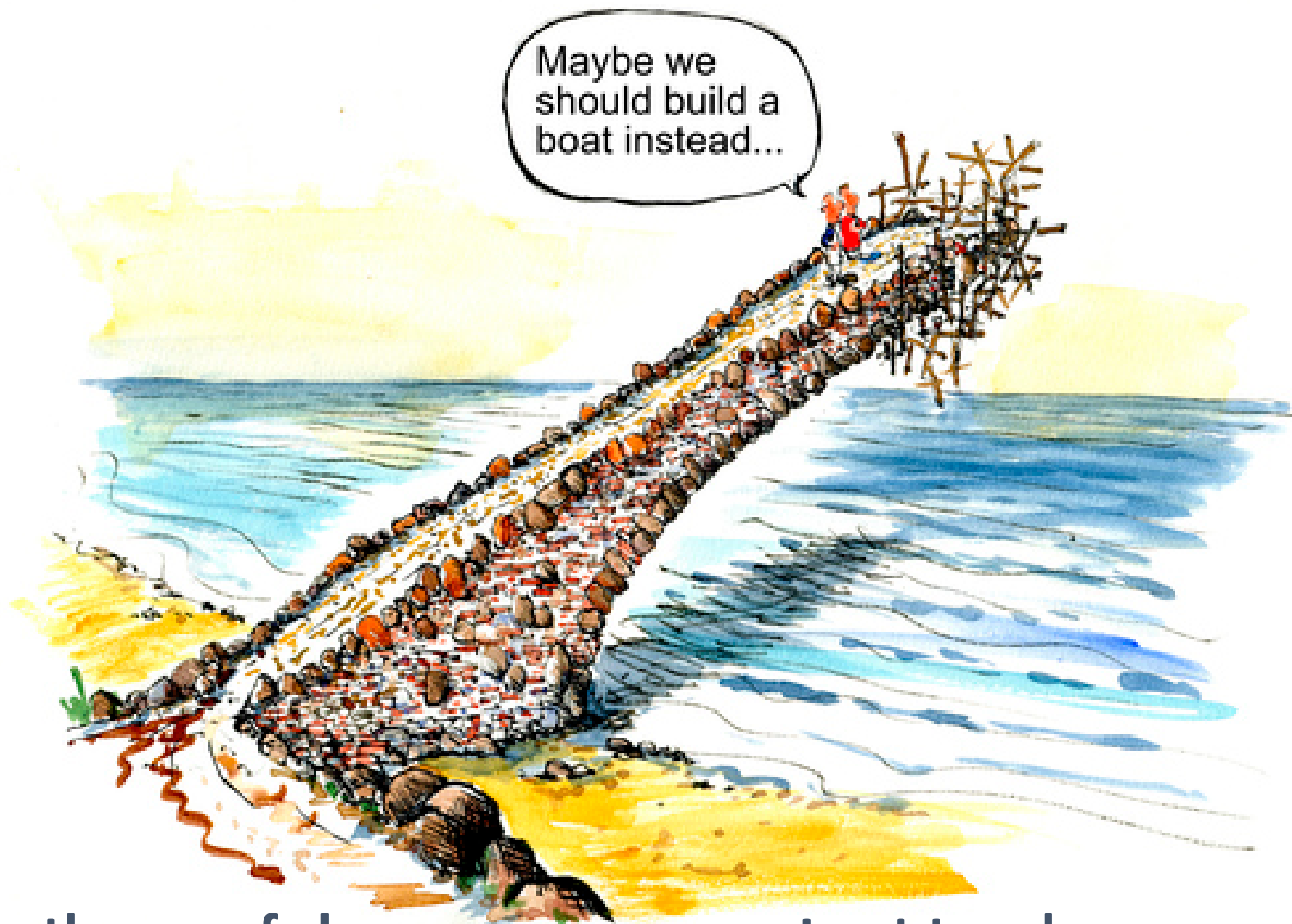
# Why develop a Theory of Change?

- **Design** – to make projects more effective
- **Engage** – to help teams work together
- **Communicate** – to explain a project's aims and activities
- **Measure** – to help learn; to allow adaptive adjustments; and to ensure indicators of success are in place



**A good Theory of Change is foundational to having confidence that an intervention is likely to have durable and transformative impact.**





**Without a theory of change, you may not get to where you want to**

# Multi-stakeholder dialogue for transformational change

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- Organized workshop with The Gordon and Betty Moore Foundation, November 12-13, 2019 in Palo Alto
- We discussed three questions:
  - Evidence on multi-stakeholder dialogue (MSD) in transformation of social-ecological systems at global and regional scales
  - Lessons to build and sustain multi-stakeholder dialogue (e.g. metrics, durability implications, co-production of knowledge)
  - Implications for future GEF programming



[www.guardian.co.uk](http://www.guardian.co.uk)

# **Multi-stakeholder dialogue: evidence from the literature**

- Research providing practical insights into the design implementation and effectiveness of MSD for transformational change is sparse and dispersed

However:

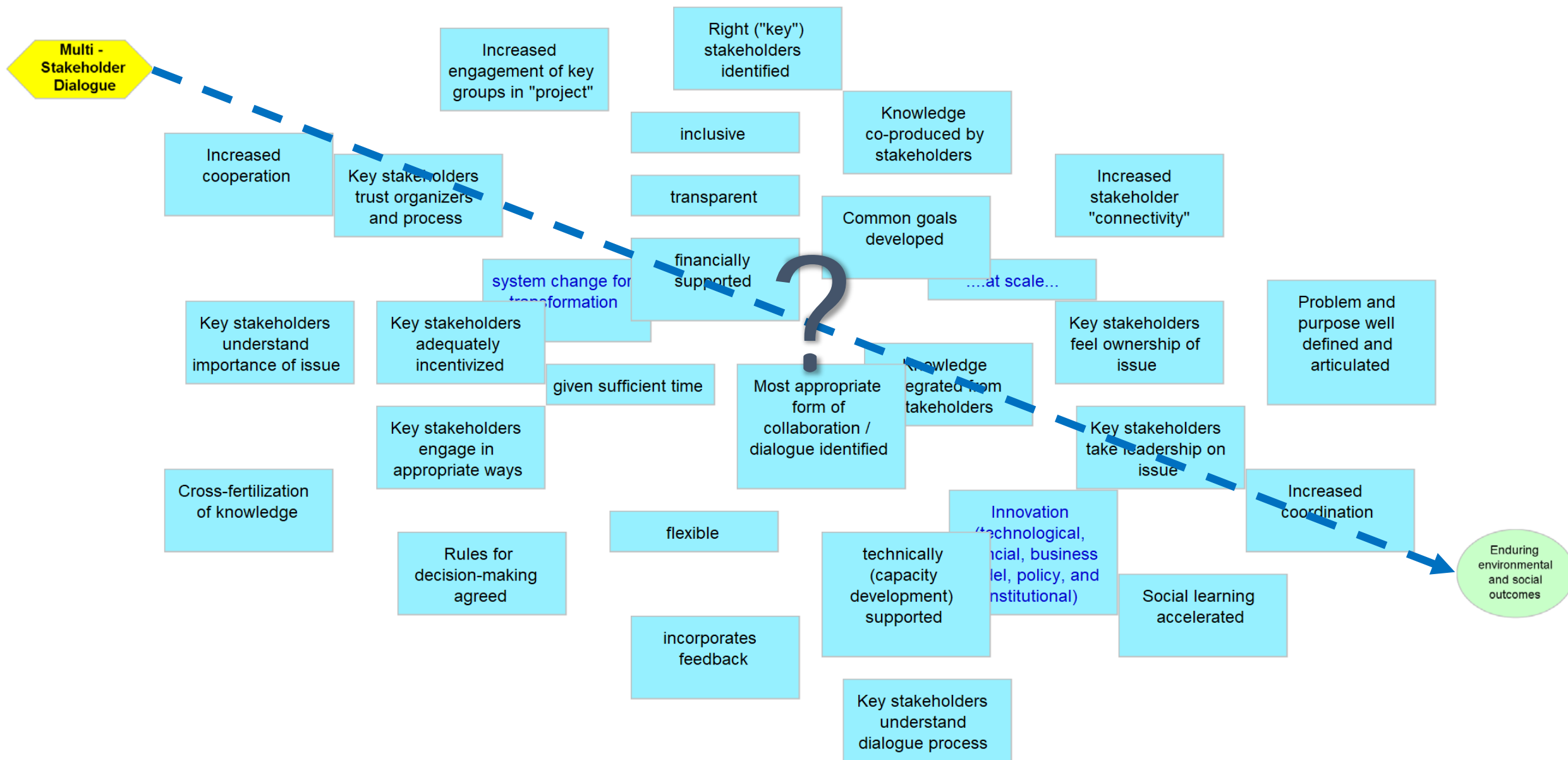
- The literature does underline the importance of understanding the system you are trying to change, the sequence of project actions, and how key actors may be affected at each stage.
- A prerequisite to building effective MSDs is providing mechanisms for interaction that recognize established relationships, and account for them in designing process (these need not be new ones!)



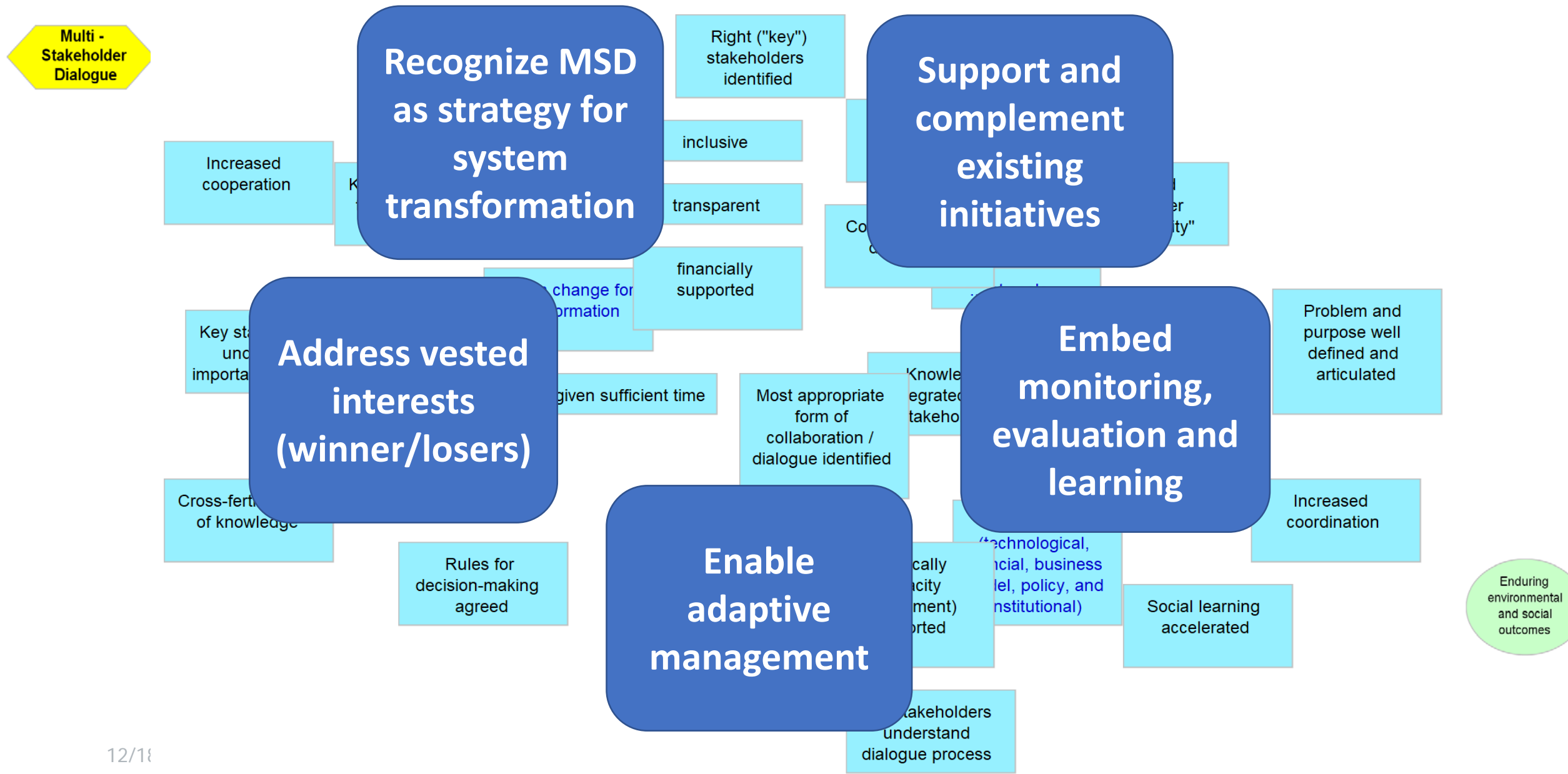
# A theory of change for multi-stakeholder dialogue?



# A draft theory of change for multi-stakeholder dialogue



# A draft theory of change for multi-stakeholder dialogue





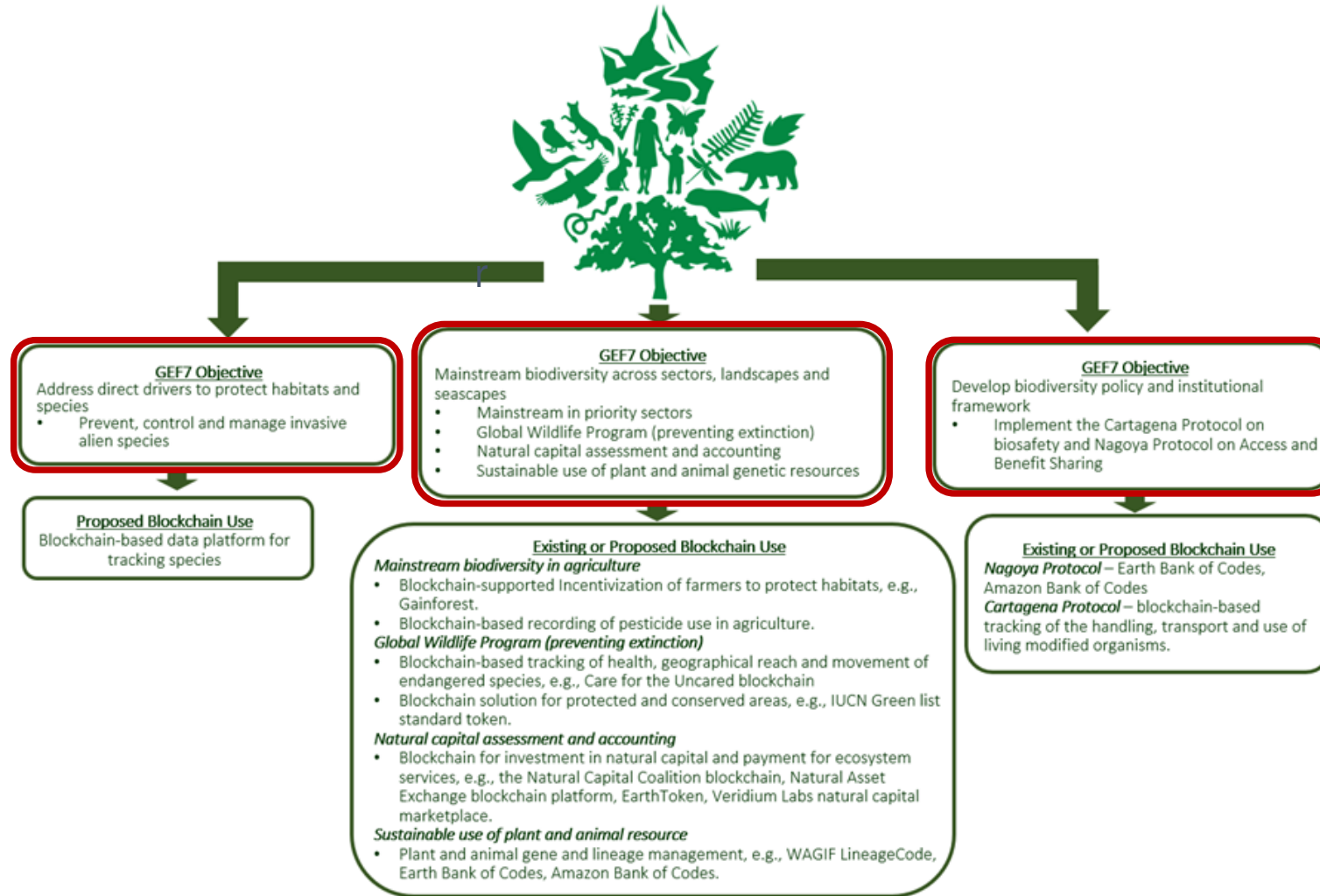
# Blockchain for harnessing global environment benefits

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- Blockchain is useful for:
  - Accurate record-keeping
  - Greater transparency; increased trust
  - Better security and traceability
  - More efficient, faster transactions
  - Reduced costs
- Environmental applications include:
  - Improved monitoring, reporting, verification
  - Incentives for sustainable resource management
  - Sustainable and transparent supply chains
  - Innovative environmental finance and business models



# Blockchain and biodiversity



# Examples of blockchain applications in biodiversity

Existing or proposed blockchain use (*none currently in GEF portfolio*):

## **Mainstream biodiversity in agriculture**

- Incentivization of farmers to protect habitats, e.g., *Gainforest*.
- Recording of pesticide use in agriculture

## **Global Wildlife Program (preventing extinction)**

- Tracking of health, geographical reach and movement of endangered species, e.g., *Care for the Uncared* blockchain
- Certification for protected/ conserved areas, e.g., *IUCN Green list standard token*

## **Natural capital assessment and accounting**

- Investment in natural capital and payment for ecosystem services, e.g., *the Natural Capital Coalition blockchain, Natural Asset Exchange blockchain platform, EarthToken, Veridium Labs natural capital marketplace*

## **Sustainable use of plant and animal resources**

- Plant and animal gene and lineage management, e.g., *WAGIF LineageCode, Earth Bank of Codes, Amazon Bank of Codes*

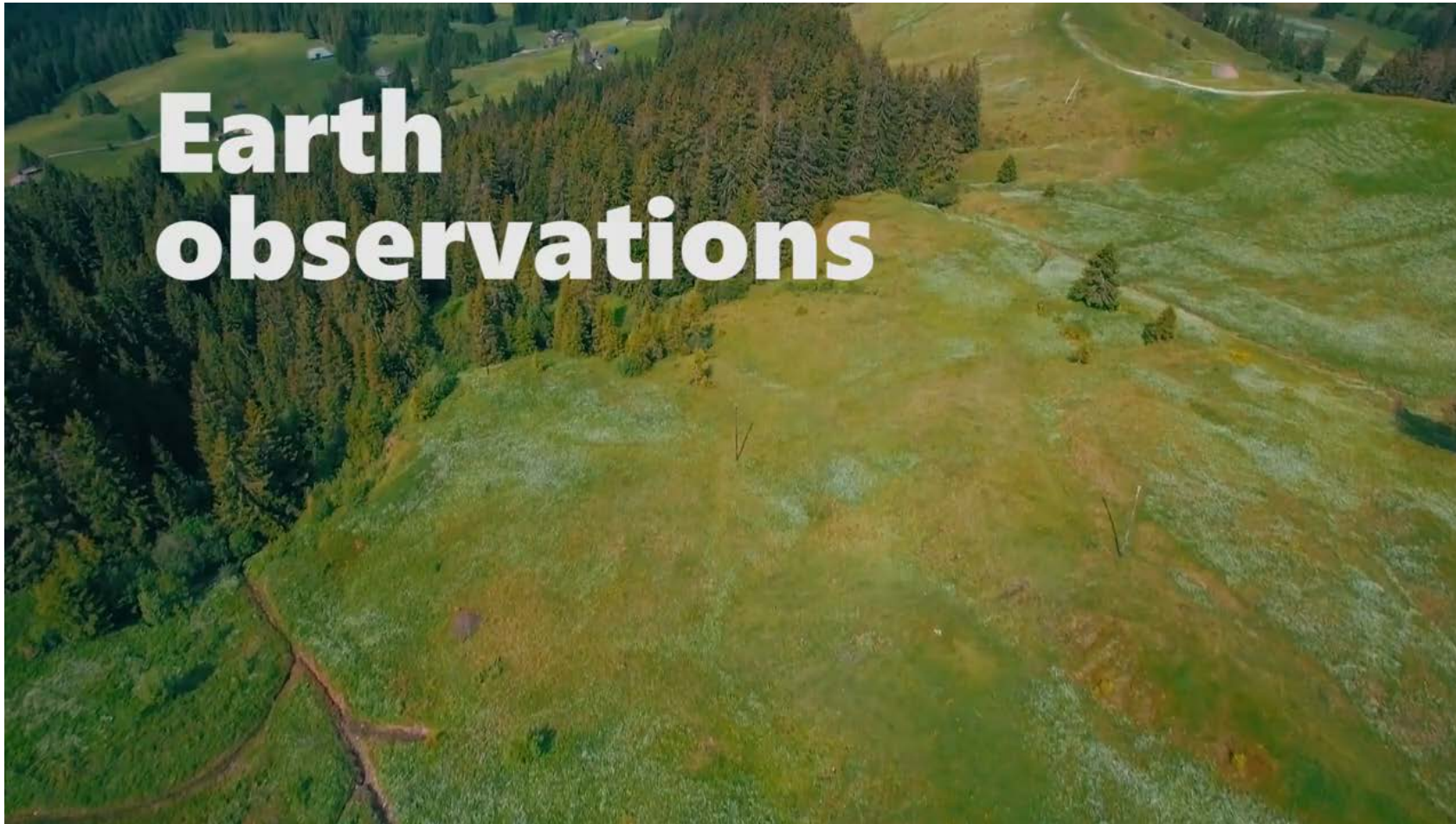
# Potential near-term applications of blockchain for the GEF

- Track and verify sustainable charcoal production
- Improve the transparency of commodity supply chains
- Improve the security and accuracy of land tenure systems
- Improve energy access through decentralized renewable peer-to-peer markets and community trading
- Improve the traceability of energy sources, and enable users to differentiate between renewables and fossil fuels
- Facilitate the decarbonization of transportation systems
- Improve the traceability and tracking of chemicals supply chains



# Earth Observation and the GEF

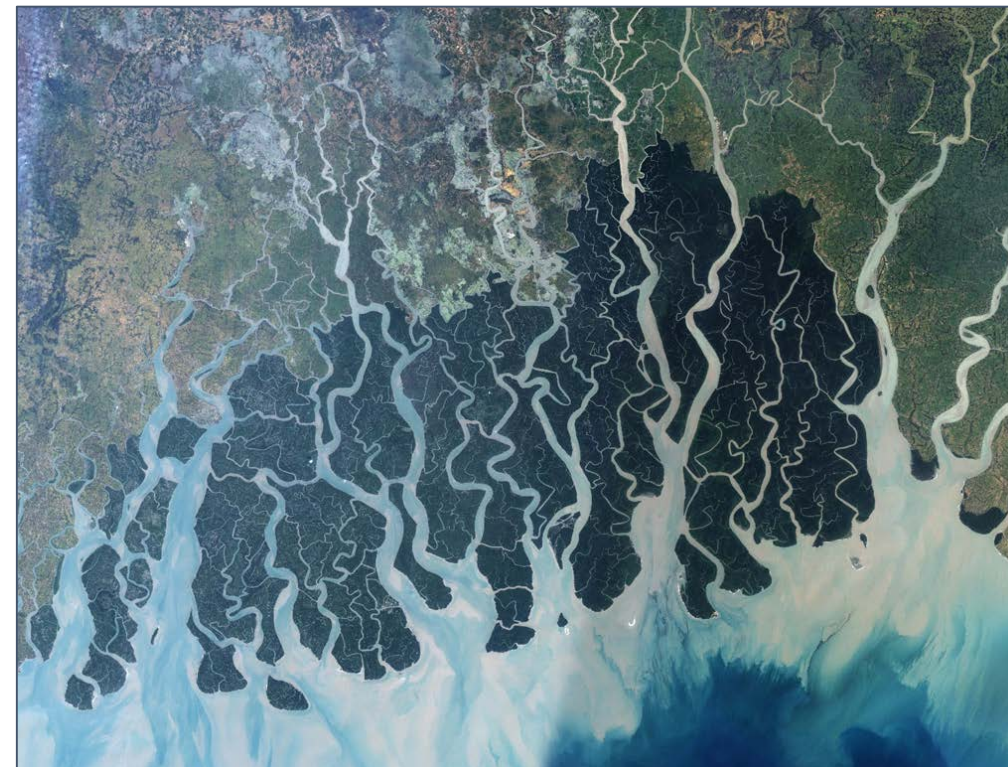
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# Earth Observation and the GEF

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- In GEF 7 – there is a requirement to include a map and geo-coordinates at PIF stage.
- Most agencies already make some use of geospatial information.
- Some applications of Earth Observation data:
  - assessment of forest and above ground carbon stocks,
  - land productivity and vegetation trend analysis,
  - land use/land cover change,
  - soil organic carbon estimations,
  - land degradation trends
  - monitoring of water-related ecosystems
  - mapping urban growth and monitoring air quality
  - monitoring marine ecosystem health / inshore water quality



Stretching across southwestern Bangladesh and southeastern India, the Sundarbans is the largest remaining tract of mangrove forest in the world.

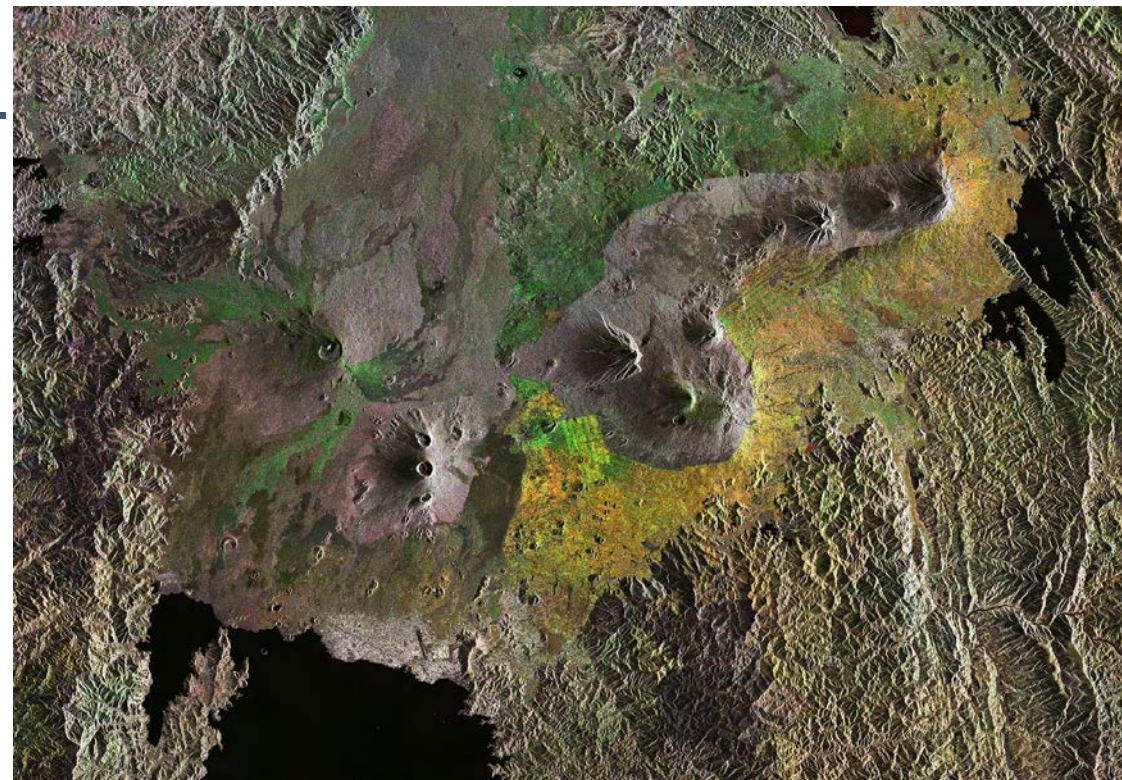
*Image: Landsat 7, NASA Earth Observatory.*



# Earth Observation and the GEF

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- Useful at several points in the project cycle from concept development to monitoring and evaluation.
- Summary document available on STAP website.
- Proposals:
  - Harmonized approach to geo-coordinates, and a map for projects
  - GEF portal to provide fields and simple tools for geographic data over the project cycle
  - Self-learning package, and a workshop
- Full paper will be available in January 2020.



Virunga Mountains in East Africa. The green, orange and yellow colors indicate surface vegetation change outside protected lands.

Image: modified Copernicus Sentinel data, processed by ESA.

# Land Degradation Neutrality guidelines

- The purpose of LDN is to preserve the land resource base by ensuring no net loss of healthy and productive land, by **avoiding, reducing, and reversing** land degradation
- These guidelines were developed in response to a request from UNCCD Parties
- They offer help in developing projects: e.g. suggest how to design steps to rehabilitate, or restore, land while ensuring this gain is not offset by losses elsewhere
- The guidelines were presented at a STAP side event at UNCCD COP14 in New Delhi, September 2019



Graciela Metternicht, STAP, presenting the LDN guidelines, UNCCD COP14.



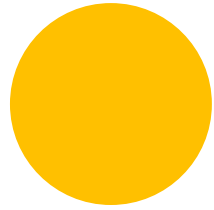
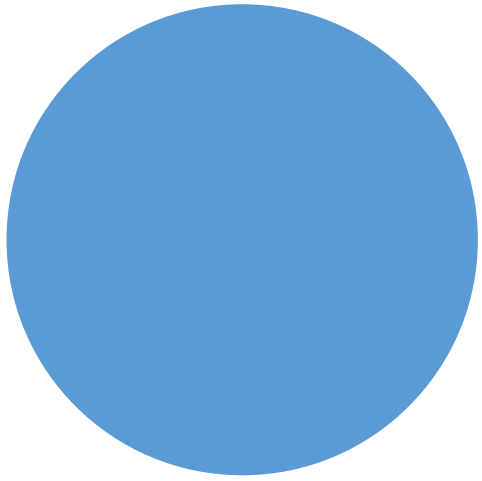
Credit: Jonathan Davies



# STAP Papers

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- Theory of Change Primer and Literature Review: <http://www.stapgef.org/theory-change-primer>
- Earth Observation: <http://www.stapgef.org/earth-observation-and-gef>
- Blockchain: <http://www.stapgef.org/harnessing-blockchain-technology-delivery-global-environmental-benefits>
- Land Degradation Neutrality: <http://www.stapgef.org/guidelines-land-degradation-neutrality>

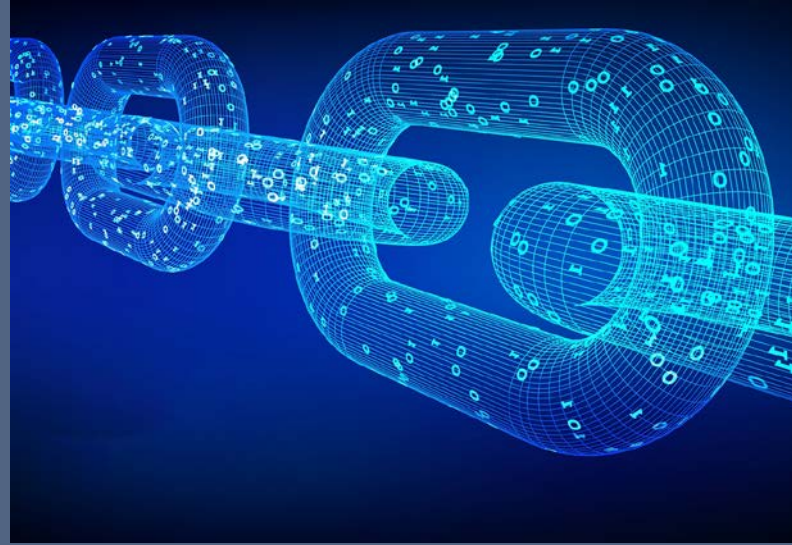


# Observations on the GEF's work program

# Observations on the December work program

Things we liked:

- Overall
- LDN and theory of change
- NGIs
- Blockchain
- Circular economy

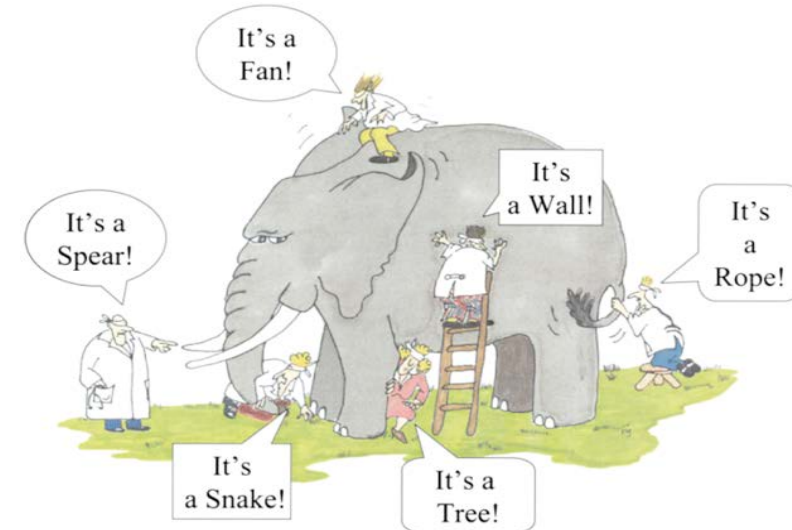
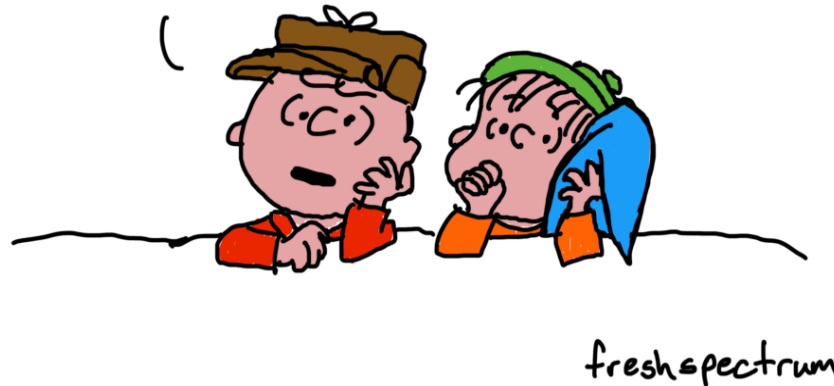


# Observations on the December work program

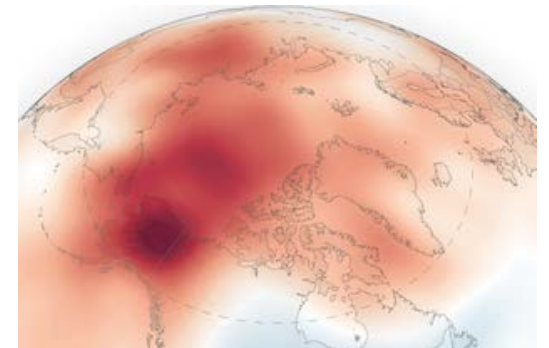
Issues requiring more attention:

- Systems thinking
- Theory of Change
- Climate risk

I don't know Linus. Has anyone even tried to evaluate Christmas? Maybe put together a theory of change or brainstorm a few measurable outcomes...



<https://www.jotform.com/blog/systems-thinking/>



<https://www.climate.gov/news-features/images-video/all>

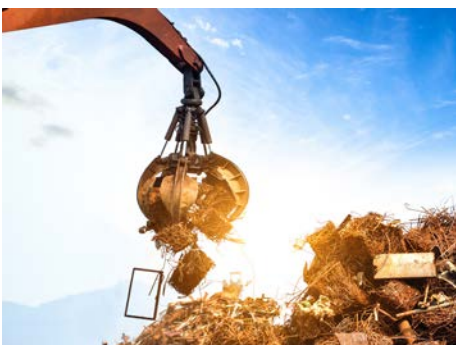


# THINKING TOWARD GEF 8



# Multiple Benefits through Sound Management of Chemicals

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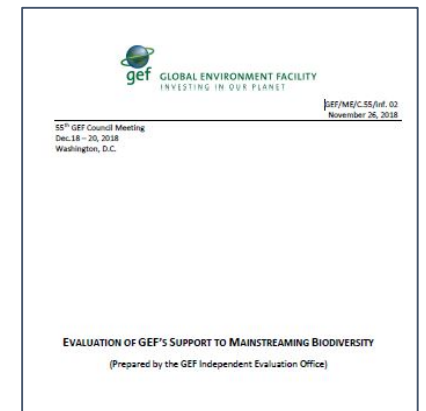
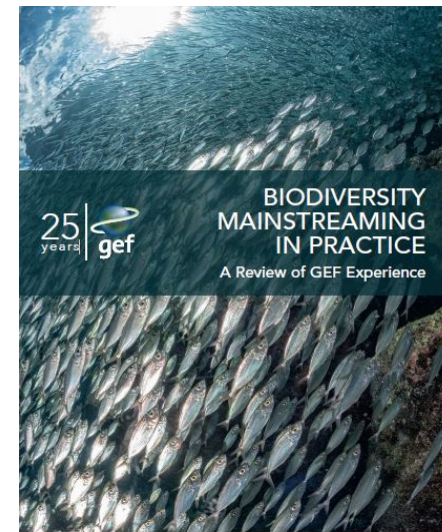
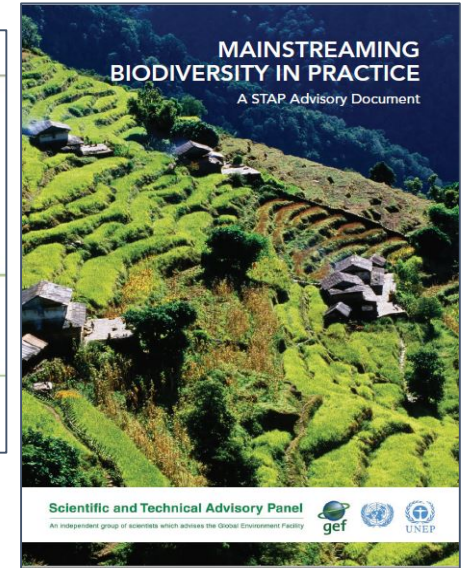
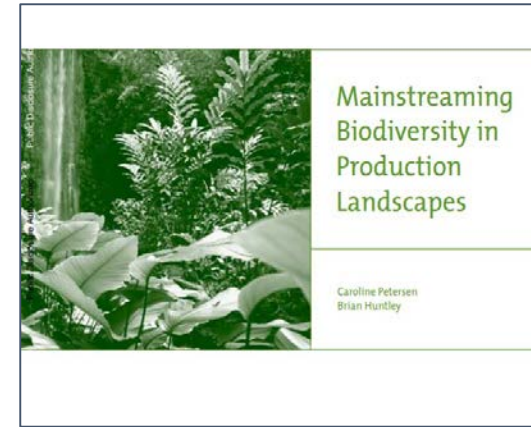


- Chemicals and waste traditionally seen as a standalone topic and focused on managing single chemicals at a time
- STAP is working on the interlinkages between chemicals and waste and the other GEF focal areas to identify co-benefits
- Will identify synergies and trade-offs
- Guidance will be provided on how to develop projects which deliver multiple global environmental and socio-economic benefits

# Biodiversity mainstreaming

Updating STAP's previous advice (2004 and 2015) on mainstreaming biodiversity, in the light of new science and evidence

And, to reflect STAP's recent advice on integration, durability, theory of change, and multi-stakeholder dialogue (forthcoming)





# Adaptation

- Building on the GCA, we may do more on:
  - Nature-based Solutions
  - Synergies between climate change adaptation and biodiversity
  - Adaptation metrics



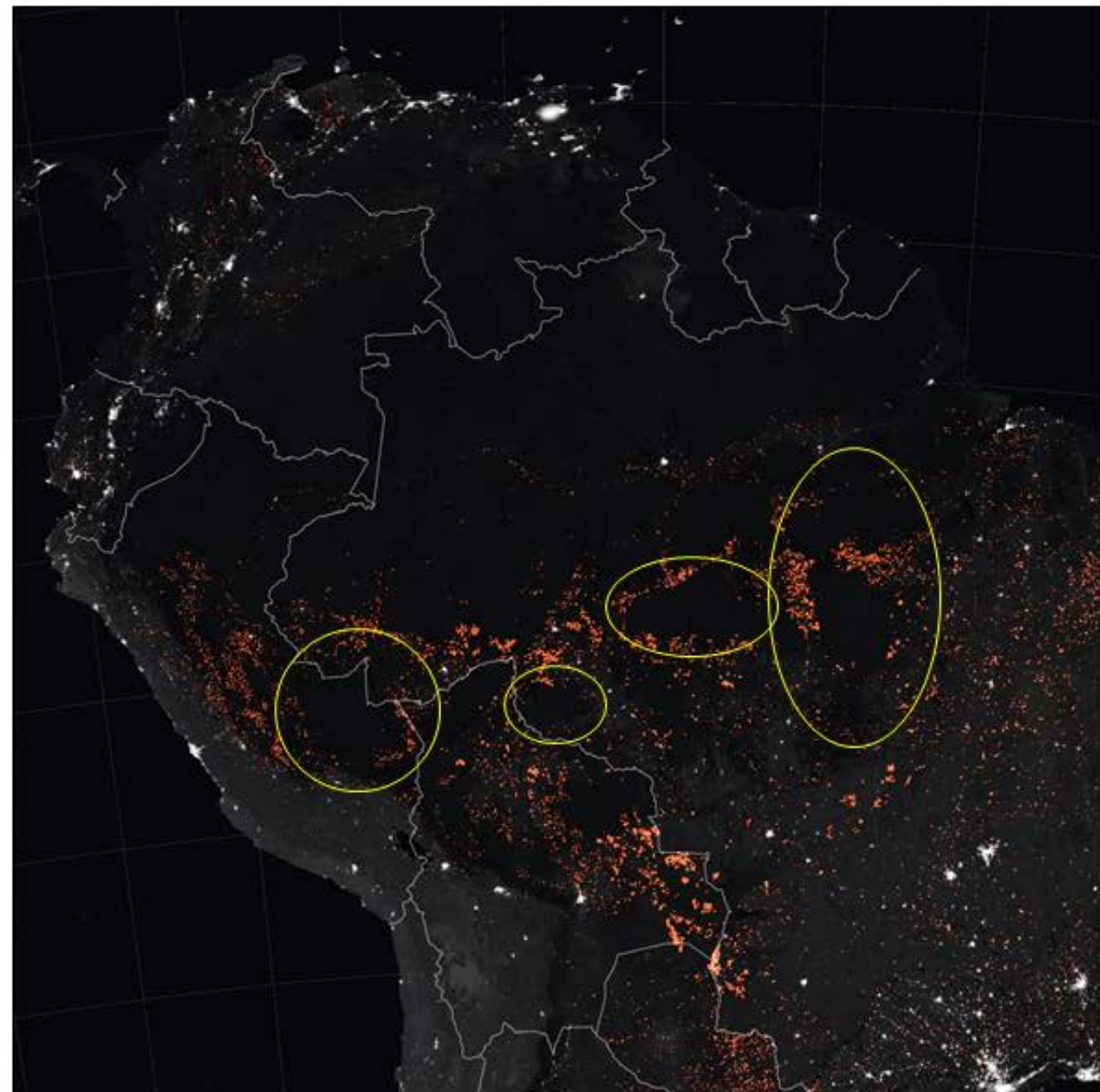
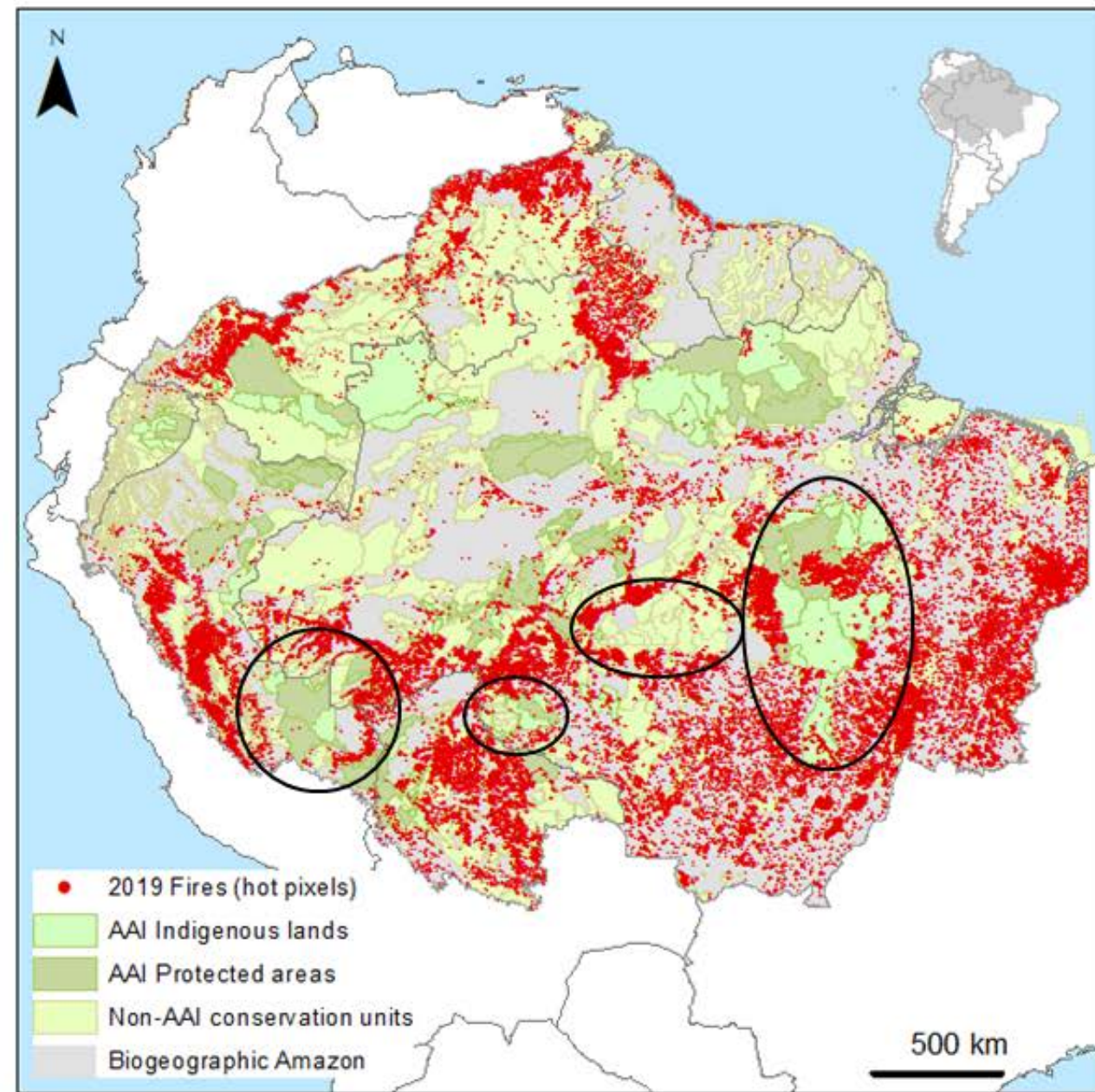




“ . . .policies that maintain options for habitat, organisms and genes will likely be least sensitive to uncertain future risks”

- Dr. Daniel Schindler





# Social science in the GEF: behavioral science

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- IPBES, IPCC, GCA & others have highlighted the importance of behavioral science
- Over 200 institutions are applying behavioral insights to develop public policy
- Behavioral transformation sought in GEF-7 programming document.
- Would build on durability paper – scaling “deep” to enable social innovation and learning processes to support it

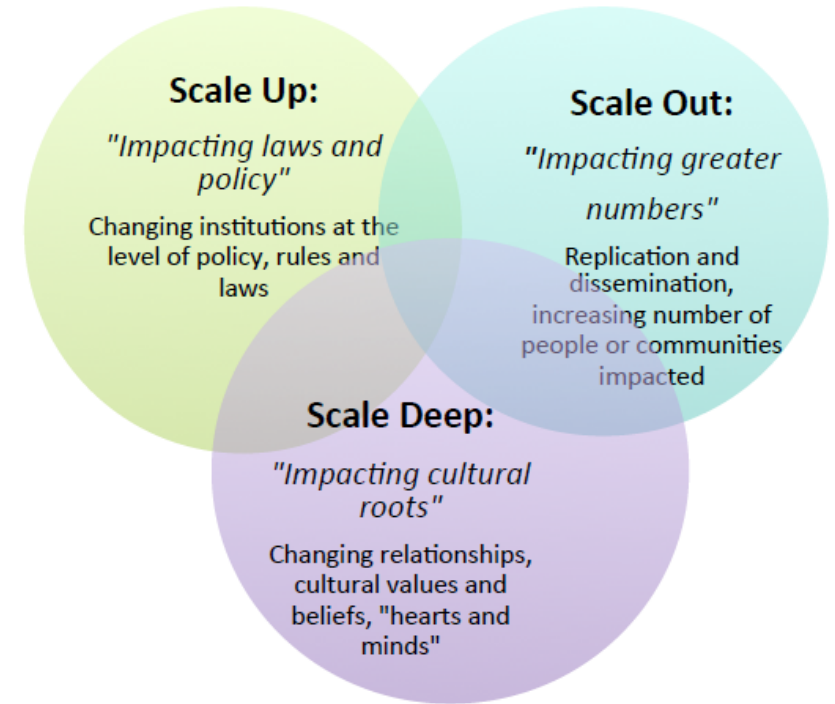


Figure 1. Scaling out, scaling up and scaling deep for social innovation

Riddell D, Moore M-L. (2015) Scaling Out, Scaling Up, Scaling Deep: Advancing Systemic Social Innovation and the Learning Processes to Support it.





Photo: Kevin Schafer