



Ziegler's crocodile newt  
(*Tylototriton zieglerei*)



Annamite striped rabbit  
(*Nesolaagus timminsi*)



Vietnamese golden cypress  
(*Cupressus vietnamensis*)



Glue-spitting Vietnamese velvet worm (*Eoperipatus totoro*)



Cua Da land crab  
(*Gecarcoidea landanii*)



Red Shanked Douc  
(*Pygathrix nemaeus*)



Great Hornbill (*Buceros bicornis*)



Vietnamese Mossy Frog  
(*Theloderma corticale*)

## Scientific and Technical Advisory Panel Report to the 54<sup>th</sup> Meeting of the GEF Council

# STAP Panel Members

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**Rosina Bierbaum**  
*Chair, USA*



**Thomas Lovejoy**  
*Senior Advisor to Chair*



**Blake Ratner**  
*International Waters*  
USA



**Brian Child**  
*Biodiversity*  
South Africa



**Ricardo Barra**  
*Chemicals & Waste*  
Chile



**Annette Cowie**  
*Land Degradation*  
Australia



**Ferenc Toth**  
*Climate Change*  
*Adaptation*  
Hungary



**Ralph Sims**  
*Climate Change*  
*Mitigation*  
New Zealand

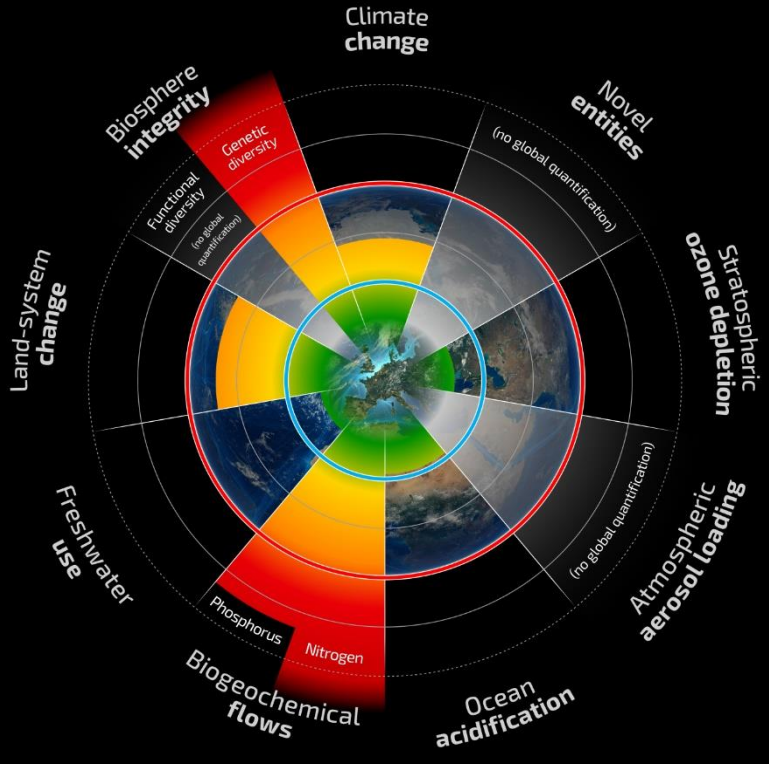
# Michael Stocking



*The livelihoods of most rural people are directly supported by soil;  
and all of us, whether  
in recreation or occupation or subsistence, depend upon soil as the  
hub of all life-supporting processes.*

# Planetary Boundaries

A safe operating space for humanity

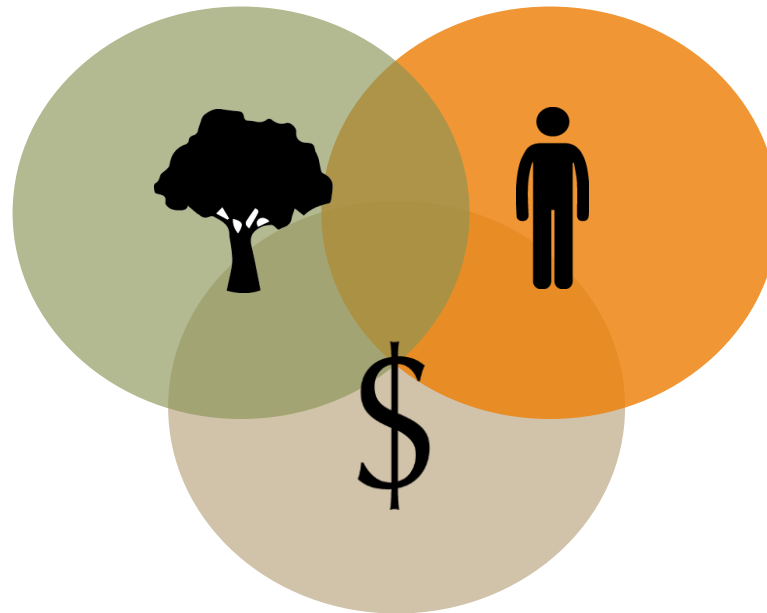


- Beyond zone of uncertainty (high risk)
- In zone of uncertainty (increasing risk)
- Below boundary (safe)
- Boundary not yet quantified

Source: Steffen et al. Planetary Boundaries: Guiding human development on a changing planet. *Science*, 16 January 2015.  
Design: Globaia

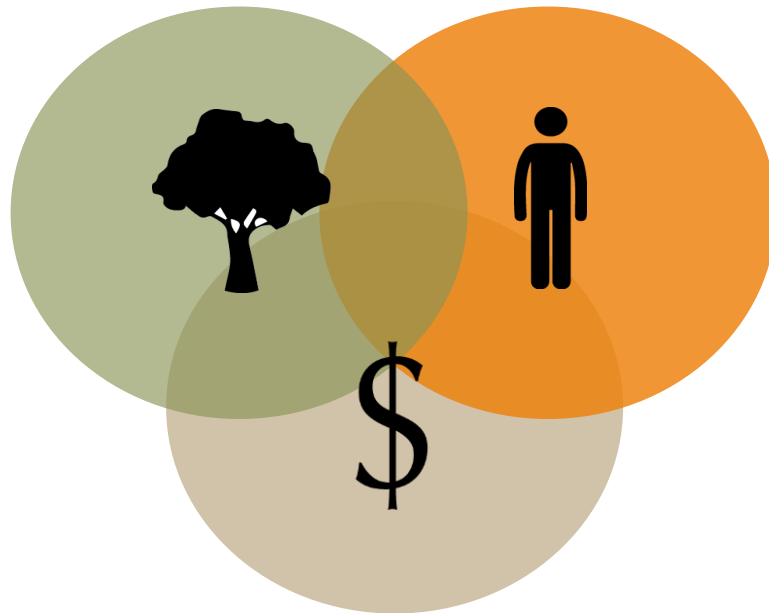
# The 3 inter-dependent facets of sustainability

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# The 3 inter-dependent facets of sustainability

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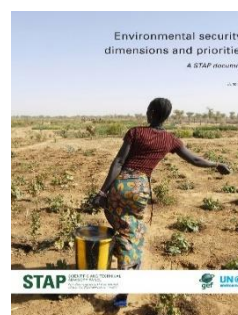
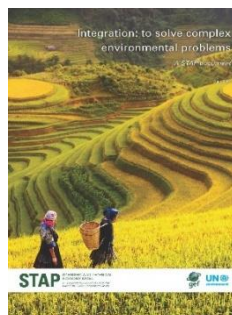


In 2014, STAP called for a focus on “environmentally sustainable development”

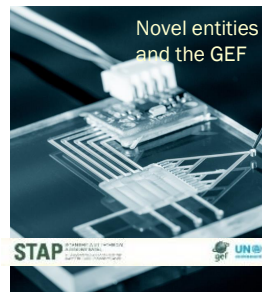
<http://www.stagef.org/stap-report-fifth-gef-assembly>

# Integration, Innovation, and Learning

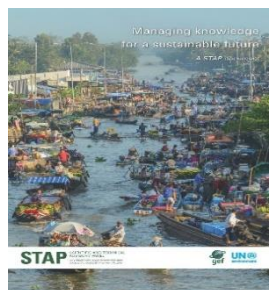
## Integration



## Innovation



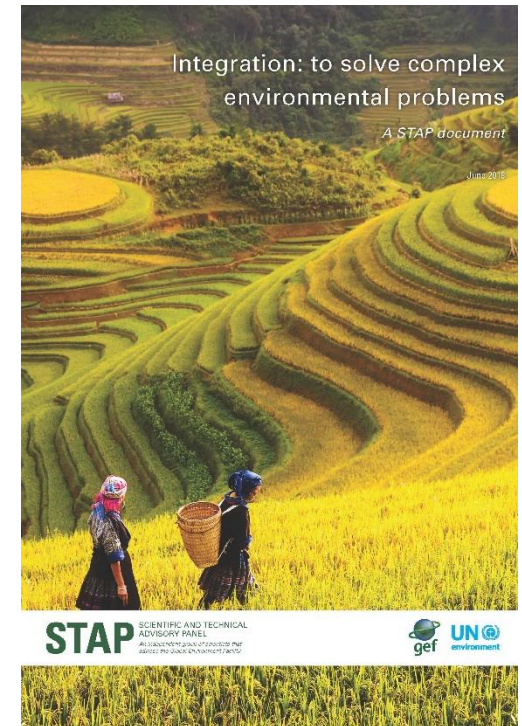
## Learning



# Integration to solve complex environmental problems

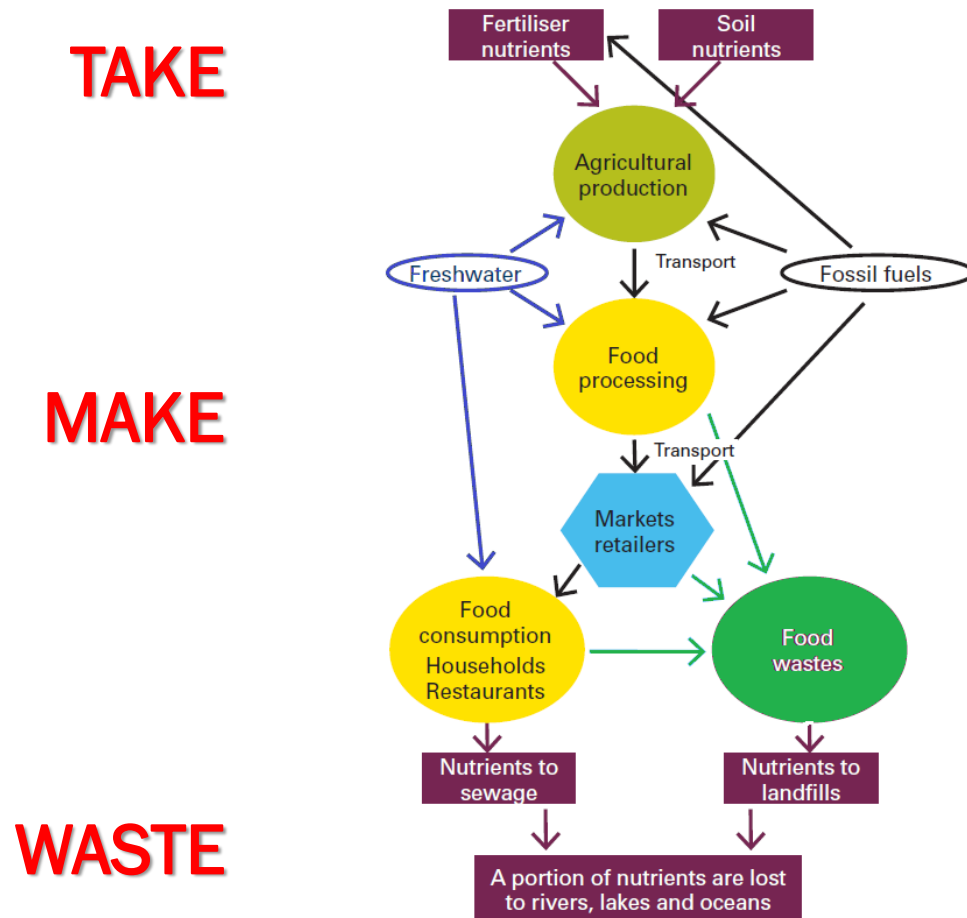
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1. Systems thinking
2. Theory of change & Plan B
3. Resilience planning
4. Implementation pathways
5. Knowledge management
6. Stakeholder engagement
7. Flexibility

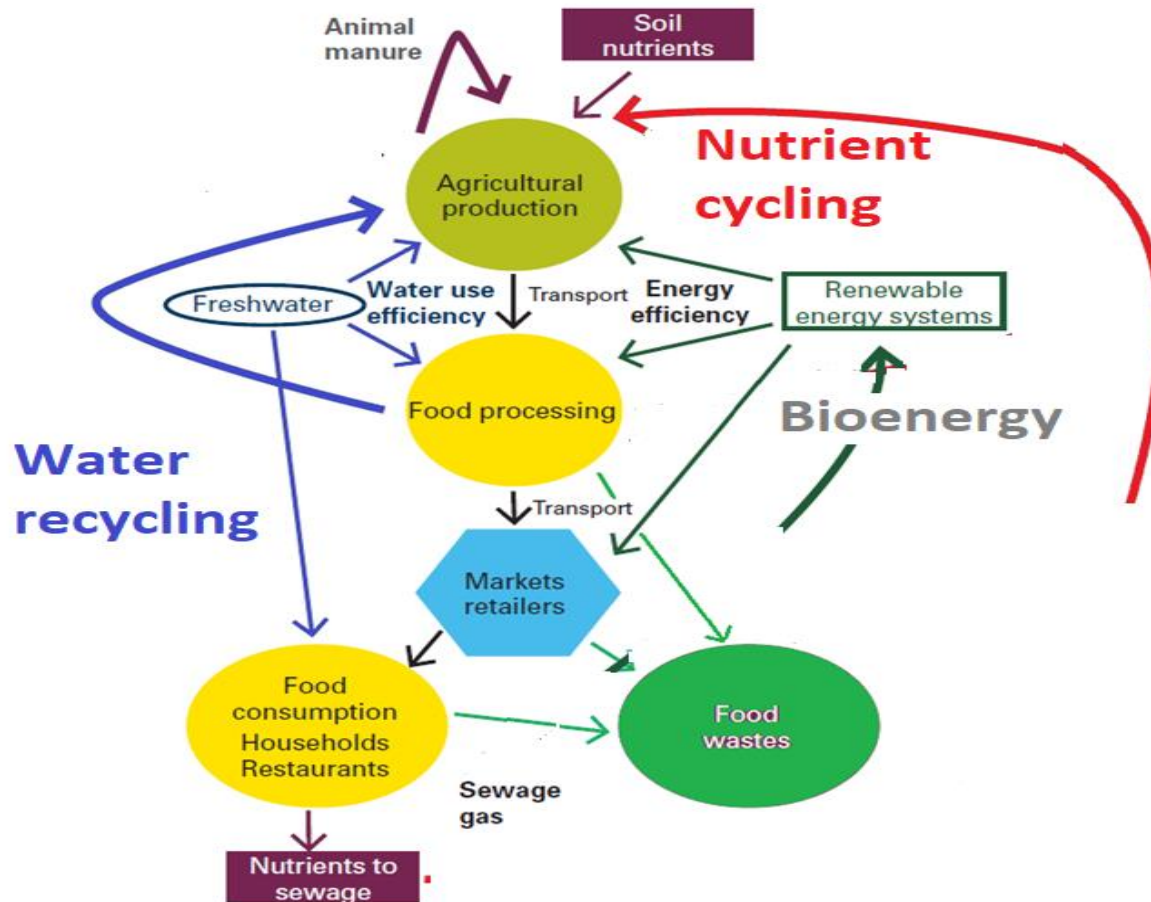




# Bringing integration to our food system



# The circular economy food system



# A future food system for healthy human beings and a healthy planet

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## *Problem:*






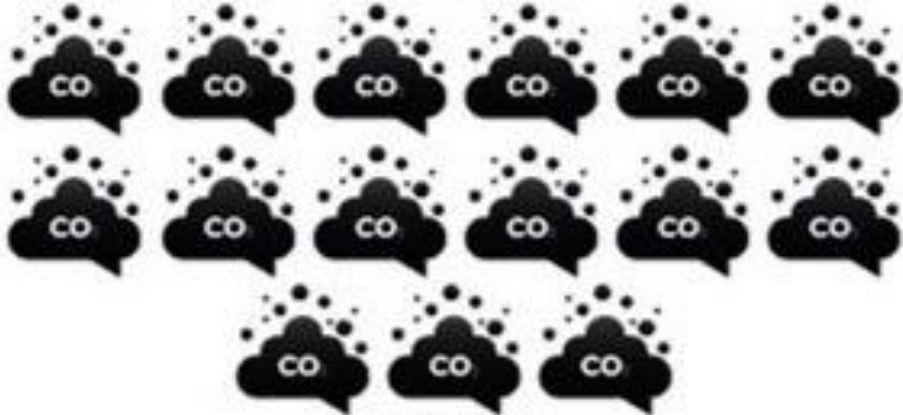
- Need to increase food production, but current “take-make-waste” system detrimental to the environment

## *Solutions:*









- Reduce inputs and use resources more efficiently, without decreasing productivity
- Circular economy keeps resources in use, maximizes value, recovers and regenerates at end of life - consider for the ‘Food systems, Land Use and Restoration’ Impact Program



# Systems thinking needed for plastics

Recent Estimates	Business as Usual Projections
<p data-bbox="189 372 508 405">Production and Use</p>  <p data-bbox="355 558 631 586">Up to 380 Mt in 2015</p>	 <p data-bbox="1155 558 1450 586">Up to 1500 Mt by 2050</p>
 <p data-bbox="421 768 568 796">6% in 2014</p>	 <p data-bbox="1219 768 1392 796">20% by 2050</p>
 <p data-bbox="421 1172 568 1200">1% in 2014</p>	 <p data-bbox="1219 1243 1387 1272">15% by 2050</p>

# Systems thinking needed for plastics

Disposal and Post-disposal	
 <p>6,300 Mt - cumulative from 1950 to 2015</p>	 <p>33,000 Mt by 2050</p>
 <p>4900 Mt in 2015</p>	 <p>12,000Mt by 2050</p>
 <p>Over 150 Mt in 2015</p>	 <p>Over 450 Mt by 2025</p>
 <p>1:5 in 2014</p>	 <p>1:1 by 2050</p>

# Plastics and the circular economy

## *Problem*

- Plastics consume/affect a lot of natural resources:
  - Oil, produces carbon dioxide
  - 185 liters of water to make 1 kg of plastic
  - plastics ingested by marine life
  - Microplastics contaminate drinking water, fish
- Plastics use chemical additives including POPs
- Last for decades to centuries

## *Solutions:*

- Renewable feedstocks
- Use plastics as resources
- Redesign plastics
- Business and consumer collaboration
- Fiscal and regulatory measures



# Environmental security: dimensions and priorities

STAP Assembly report 2014 encouraged more attention to environmental security:

*“to enable improved human well-being, health, security, livelihoods and social equity at the same time as environmental benefits”*

Environmental security is centrally important to the GEF. Relevant to **all focal areas**

Many GEF operations **exposed to conflict risk**

Addressing environmental security in an **explicit, consistent and integrated** manner is essential to deliver global environmental benefits – including the sustainability of GEF project investments.



# Environmental security: dimensions and priorities

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## Recommendations:

1. Explicitly address environmental security in project and program design
2. Consider use of protocols from GEF agencies (including UNDP, UN Environment and World Bank, etc.) to assess conflict risk
3. Evaluate links between environmental change and vulnerability in GEF interventions
4. Contribute to conflict prevention through environmental cooperation





# Innovation

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“...an idea, embodied in a technology, product or process, which is new and creates value...To be impactful, innovations must also be scalable, not merely one-off novelties”

Five domains:

- Technological
- Business model
- Institutional and social
- Policy
- Financing

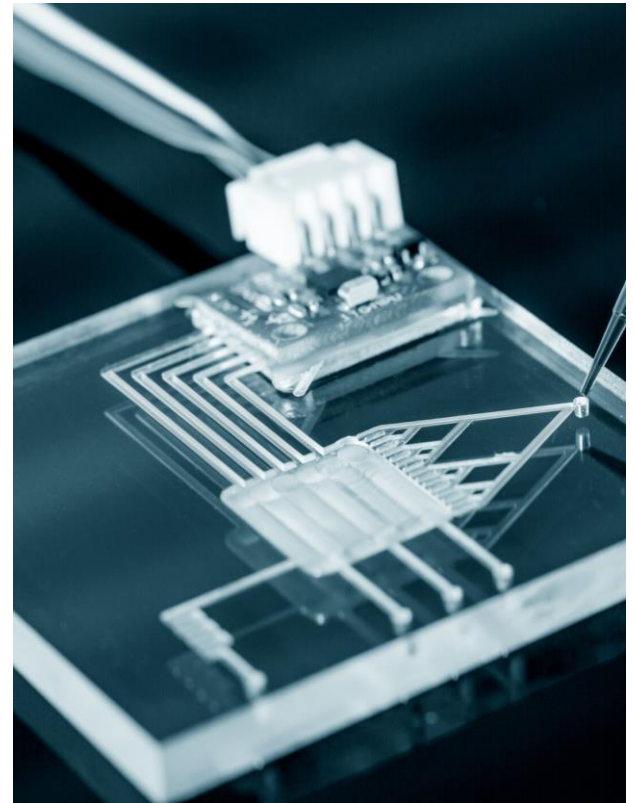


# Novel entities

**Novel entities** are broadly defined as, “things created and introduced into the environment by human beings that could have positive or negative disruptive effects on the earth system; and may include synthetic organic pollutants, radioactive materials, genetically modified organisms, nanomaterials, microplastics.”

## Importance – past novel entities:

- **CFCs** ➡ ozone depletion
- **POPs** ➡ impact on ecosystems, biodiversity and human health



# Novel entities: examples

## Gene editing: modification of DNA of organisms

- +Cacao and maize plant - climate change adaptation
- +Controlling methane emission in ruminants
- +Saving endangered species or eradicating invasive species
- But threat to biodiversity, ecosystems

## Technological critical elements (rare earth elements): needed for green and emerging technologies

- But chemical pollution, biodiversity loss, deforestation, and land degradation

## Cellular agriculture: producing livestock products from cell cultures without the animal itself

- +Help reduce the environmental footprints of current food production systems
- ? But regulation, ethical concerns, and public acceptance



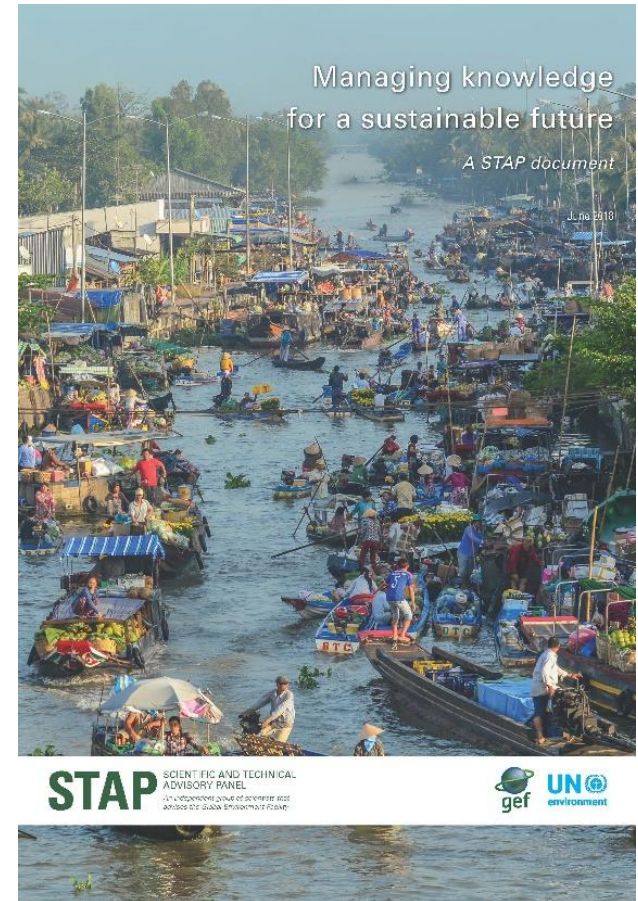
# Learning

Knowledge management essential for:

- Maximize GEBs
- Evaluating best practices
- Scaling-up
- Transformational change

Recommendations:

- 5% set-aside for KM applied in all programmes/projects



# Local commons for global benefits

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- Community-based natural resource management is a local approach to sustainability problems
- Applicable where poverty and biodiversity losses overlap
- 4 key elements:
  - Ownership
  - Price
  - Governance
  - Co-learning and adaptive management



# Preliminary GEF-7 Work program

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- **Integration**
  - Climate risk screening
  - Stakeholder engagement in socio-ecological transformations
  - Land Degradation Neutrality guidelines
  - Reducing climate vulnerability and climate adaptation
- **Innovation**
  - Remote sensing
  - Aquaculture contributions to nutrition security, climate mitigation, and land restoration
- **Learning**
  - Development of a global mercury platform
  - Estimating environmental impact of C&W projects
  - Continue to press for monitoring, evaluation and learning in screening

# Preliminary GEF-7 Work program

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- Continue to contribute to the Food Security, Commodities, and Cities IAPs
- And work with the GEF partnership on designing the new Impact Programs

