CCRN/IUCN INTERNATIONAL CONFERENCE
COMMUNITIES, CONSERVATION AND LIVELIHOODS
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ASSESSING COMMUNITY CONSERVATION

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The context

- **Communities, conservation and livelihoods** is big research agenda -- cuts across disciplines
- But the big agenda also enables asking some big questions, and broadening the scope of conservation:

  - "How" of conservation: who gets to have a say in conservation/management

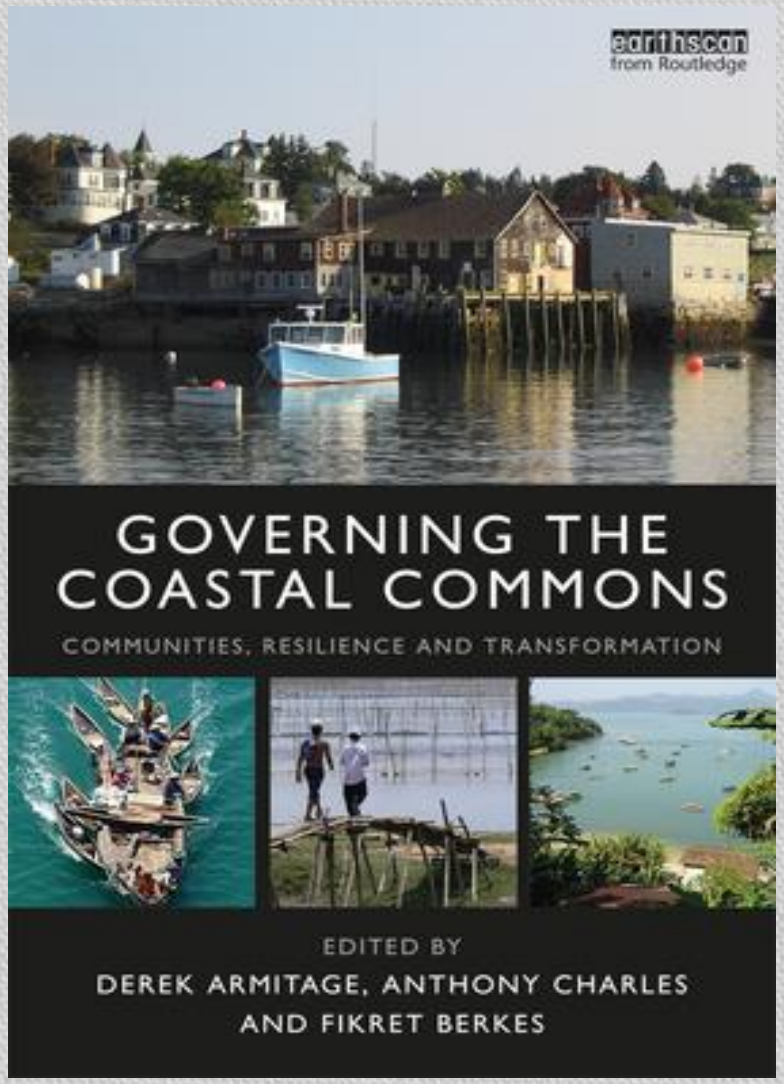
  - "Why" of conservation: livelihoods; actors and their values and needs

  - Attention to space and time scales

  - Broadening the definition of the "system" as humans-in-nature

The plan

- The unit of analysis: humans-in-nature
- Conservation-related knowledge and practice
- Governance, including commons rights and institutions
- Ability of the system to respond to change: resilience
- **Putting these all together: community conservation assessment**
- Based on CCRN and other cases and our 2017 book



Community conservation assessment

- Borrowing/adapting from **ecosystem assessment** (NRC 2007. *Analysis of Global Change Assessments*) and **resilience assessment** (RA 2010 https://www.resalliance.org/files/ResilienceAssessmentV2_2.pdf)
- **Defined** as 'a systematic evaluation of what is known about the status, trends and future trajectories of a community conservation case, focusing on livelihood benefits'
- A collective, participatory, deliberative process by which experts and communities together review, analyze and synthesize knowledge and findings (Sustainability science)
- Should be inclusive, equitable, transparent, legitimate, ethnicity-sensitive and gender-sensitive

Steps in a community conservation assessment

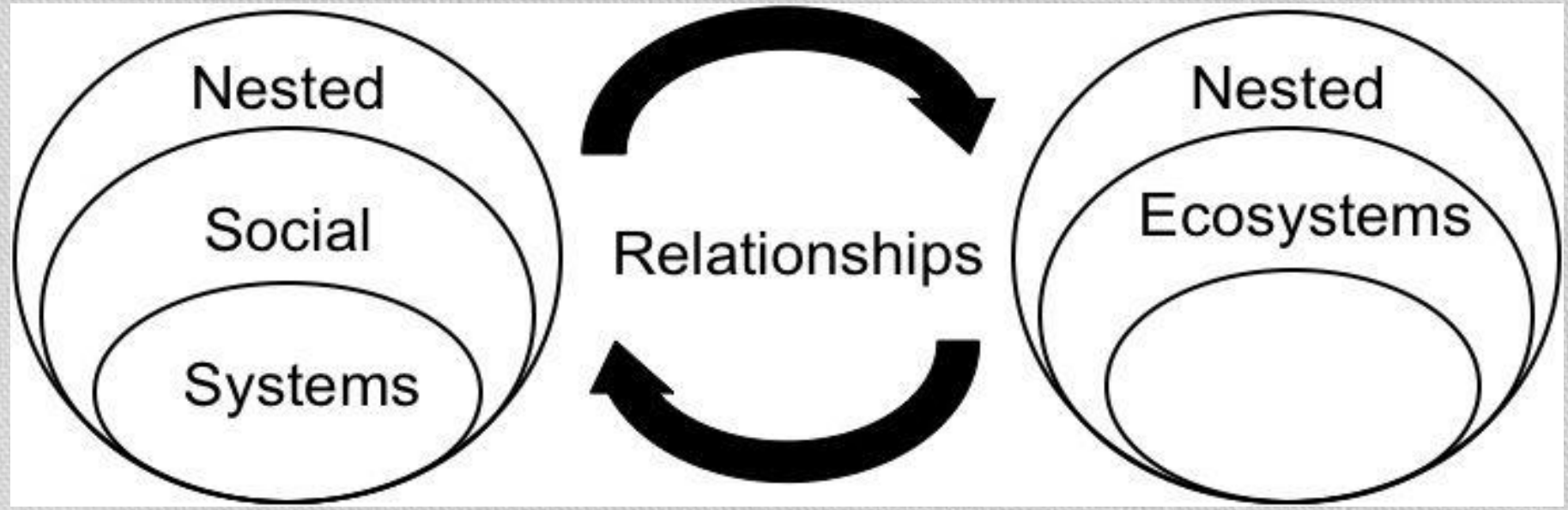
1. **Define the social-ecological system (SES):** identify the resources and the actors at the relevant space and time scales
2. **Identify conservation-related knowledge and practices**
3. **Who are the rights-holders?** Identify commons rights and institutions
   Who makes the management decisions? Characterize multi-level governance; co-management and power-sharing, if any
4. **How does the SES respond to change?** Characterize the resilience of the system; where does social learning and adaptive capacity reside?
5. **Re-evaluate and prescribe improvements:** What can be done better in terms of institution and capacity development, collective learning, knowledge co-production, resilience-building, and government polices that enable these

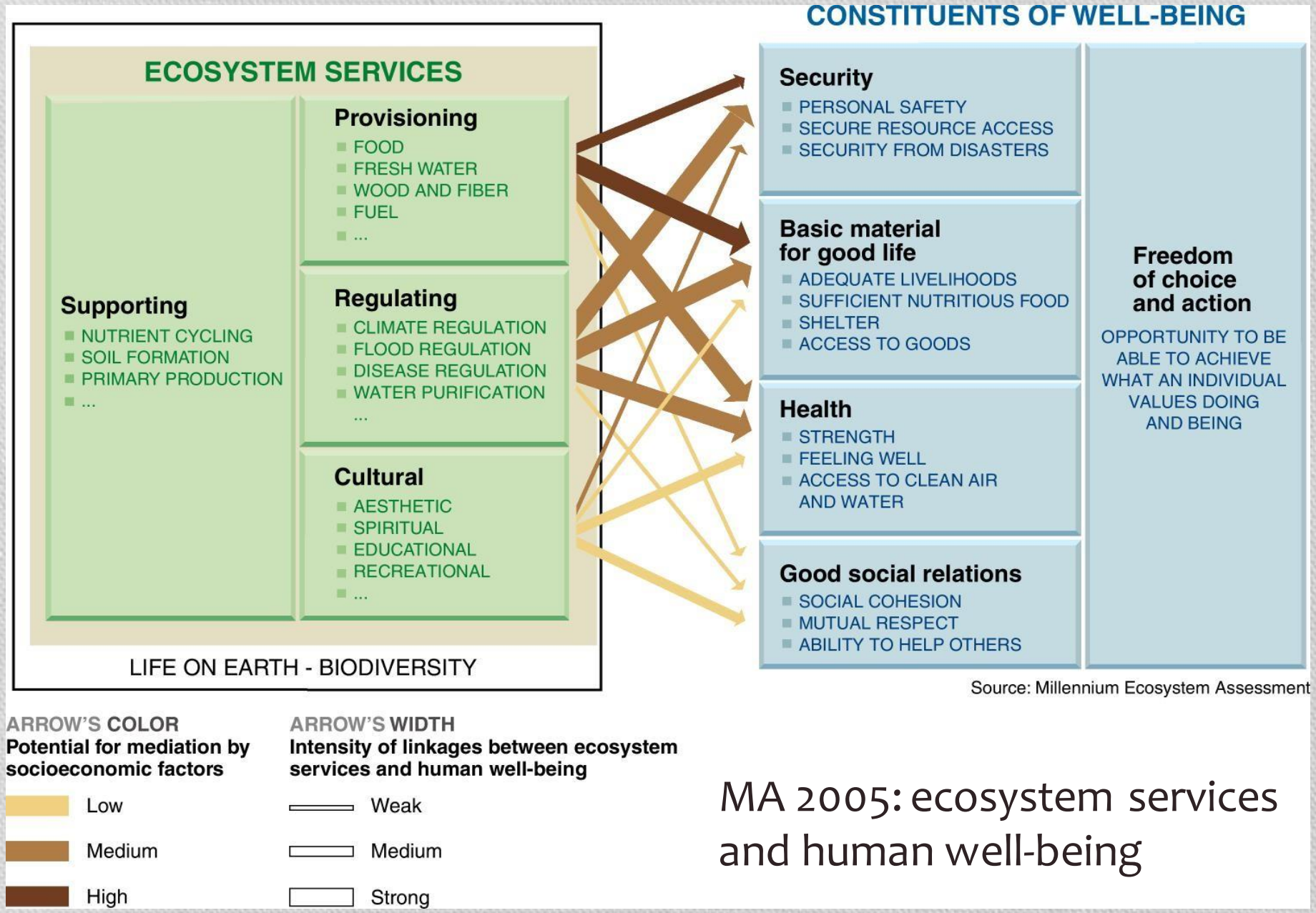
1. Social-ecological system (SES) as the unit of analysis

SES: the **complex adaptive system** that includes human and biophysical components

- coupled, interdependent, co-evolutionary
- multi-level (nested)

(Berkes & Folke, eds. 1998. *Linking Social and Ecological Systems)*



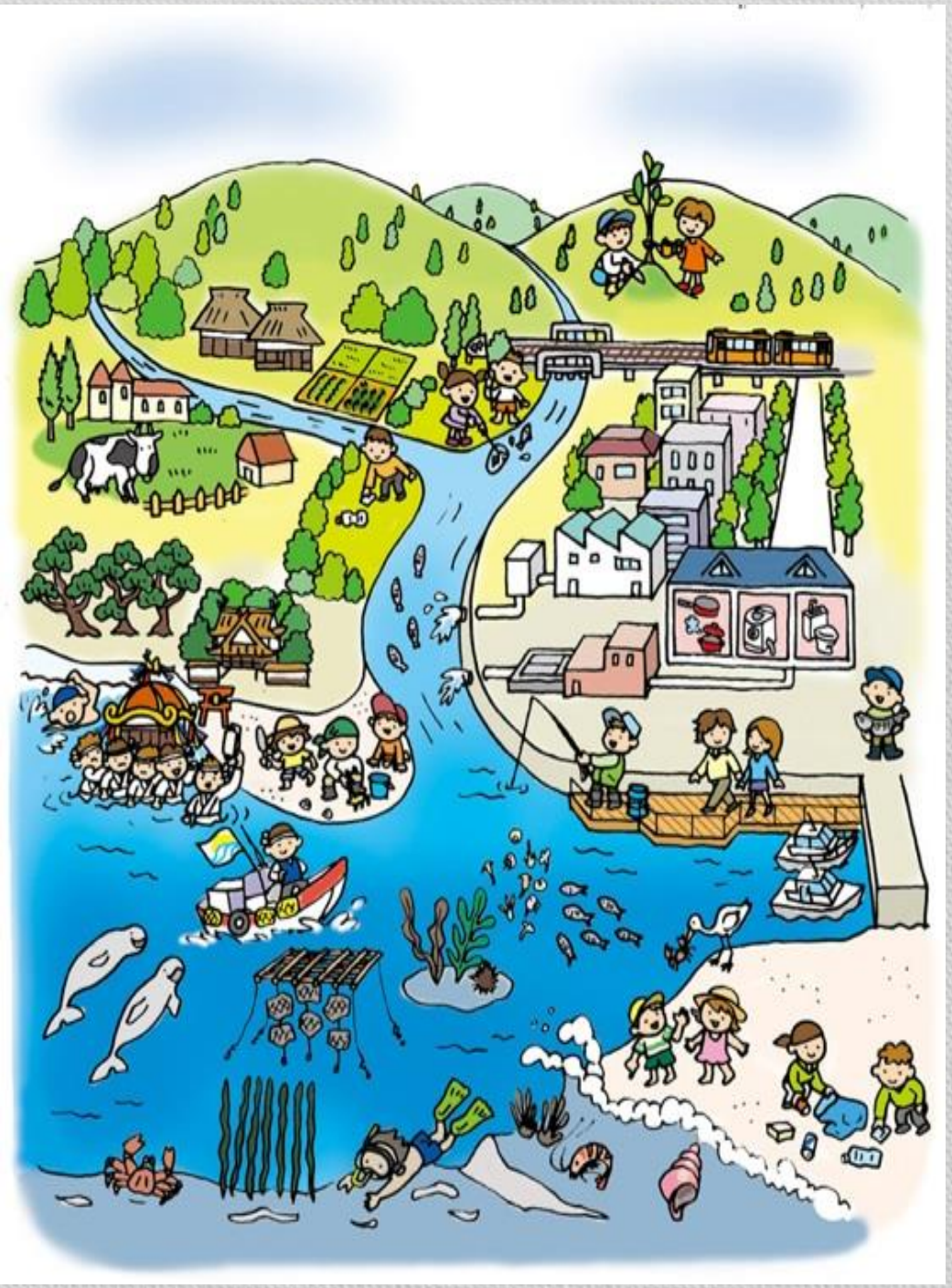


MA 2005: ecosystem services and human well-being

The Japanese SES concept of **satoyama** (sato = village; yama = hill) . Typically, a mosaic of mixed forests, rice paddy, dry rice fields, grasslands, streams, ponds.

More recently, ***satoumi****,* a mosaic of coastal ecosystems.

Application: rebuilding after the 2011 Japan earthquake and tsunami: bottom-up, customized by region and centered on local communities



Seagrass bed re-plantation in Tokyo Bay (Mitsutaku Makino)

Since the 17th century, Tokyo Bay has been famous as a production area of high quality fish for sushi. According to the maps of fishing grounds from the 19th, coastal areas were mostly tidal lands covered by seagrasses. But with urban and industrial development of Tokyo Bay 1960s on, seagrass beds almost entirely disappeared.

In 1981, scuba divers and local researchers started clean-up and re-plantation , joined by local fishers, residents, schools, NGOs and companies -- with government financial support 2003 on. Meanings of conservation was derived from the famous woodblock prints (*Ukiyoe*) of Tokyo Bay from the early 19th century.

The outcome: seagrass areas of Tokyo Bay partially recovered. As an indicator of recovery, spawning of oval squid was observed in 2004 for the first time in 30 years.

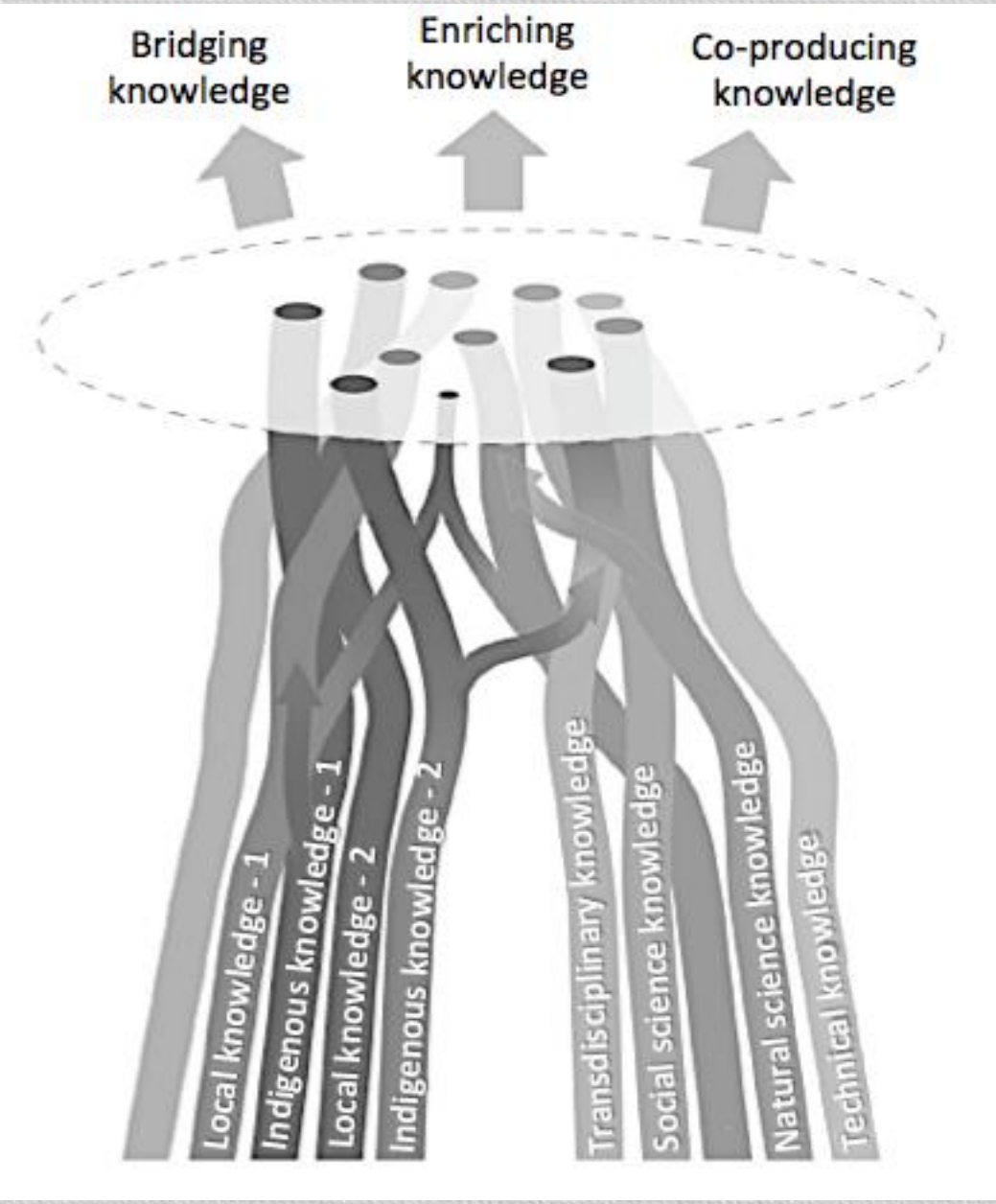
2. Knowledge and practice

- Complex systems problems, such as biodiversity conservation and climate change, have no definitive formulation and no obvious end-point; problems cannot be separated from issues of values and equity
  (Ludwig 2001. *Ecosystems*)
- Hence a new kind of approach must be created through a process by which researchers and stakeholders together **deliberate** to define the important questions, research approaches, and the resulting evidence
  (Kates et al. 2001 *Science*; Clark & Dickson 2003 *PNAS; Clark et al. 2016 PNAS*)
- Such an approach requires place-based models, sensitivity to **multiple epistemologies**

Multiple epistemologies

Multiple evidence base approach emphasizes the advantages of combining different kinds of knowledge to solve problems

(adapted from: Tengö et al. 2014. *Ambio*)



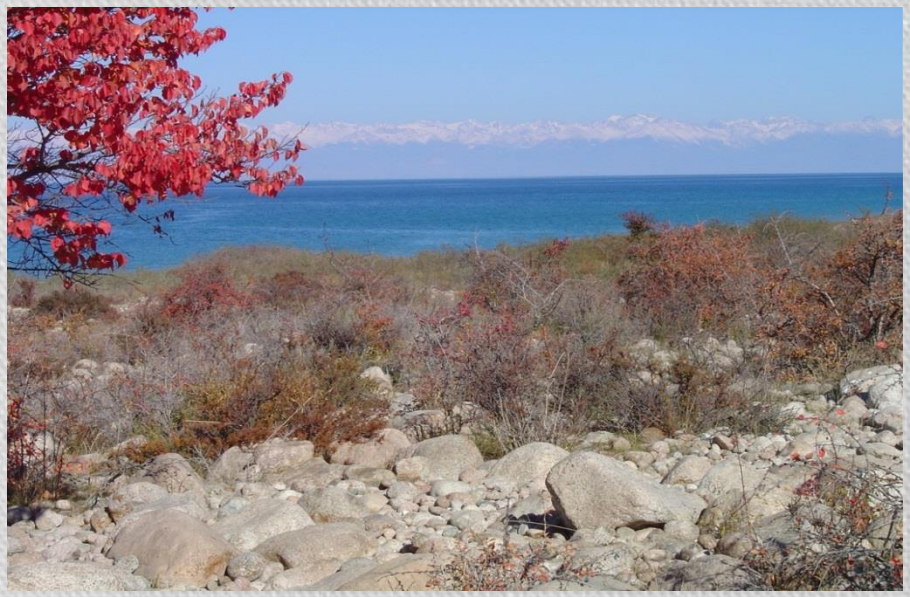
Traditional, indigenous, local knowledge

- **TEK**: A cumulative body of knowledge, practice and belief, evolving by adaptive processes, and handed down through generations by cultural transmission
- **IK**: the local knowledge held by indigenous peoples or local knowledge unique to a given culture or society

(As defined in Sacred Ecology 1999)

- **ILK** (indigenous and local knowledge) in the IPBES literature. Defined the same as TEK above

Ysyk-Köl Biosphere Reserve, Kyrgyzstan: combining community conserved areas (sacred sites) with formal protected areas?



Co-production of knowledge

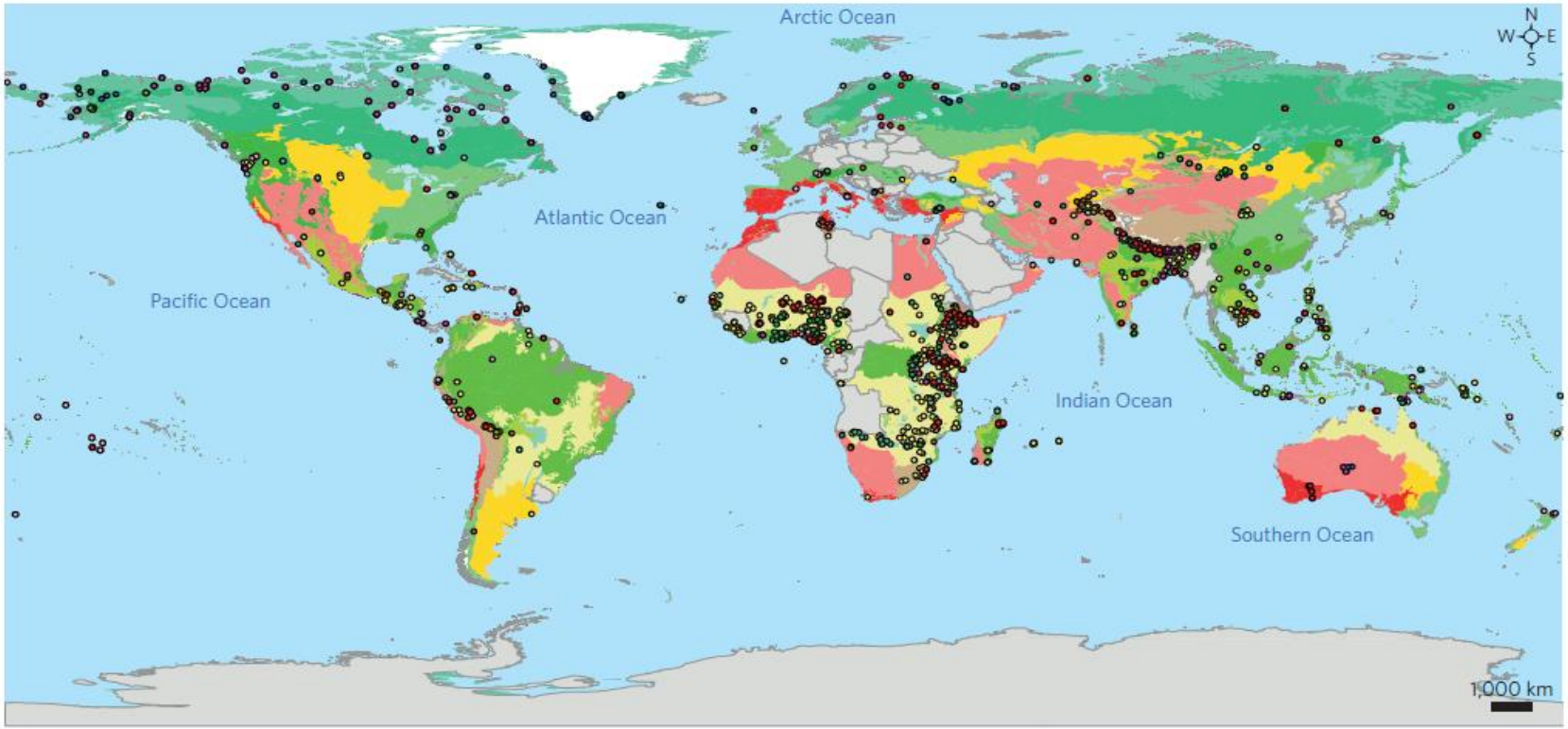
Defined as the collaborative process of bringing a plurality of knowledge sources and types together to address a defined problem (Jasanoff books; Kates et al. 2001 *Science*; **Armitage et al. 2011 *GEC***; Tengö et al. 2014 *Ambio;* Miller & Wyborn 2018 *Env Sci & Policy*)

- Collaboration involves learning together, also basis of adaptive management
- Not a "synthesis" of different kinds of knowledge but "bridging" them respectfully
- Production of "new knowledge", problem-oriented
- Example: local observations of climate change

Using local observations (TEK/ILK) to complement climate change science

- Inuit Observations of climate change study, Canadian Western Arctic, 1998-2001
- Five areas in which TEK can be used in knowledge co-production:
  - Local-scale expertise
  - Climate history baseline
  - Research hypotheses
  - Community adaptation (adaptive capacity)
  - Community-based monitoring

  (Riedlinger and Berkes 2001. *Polar Record*)
- Since then, explosion in the number of studies involving local observations of climate change: Nakashima et al. (2012) 305 references; Savo et al. (2016) 1,017 references



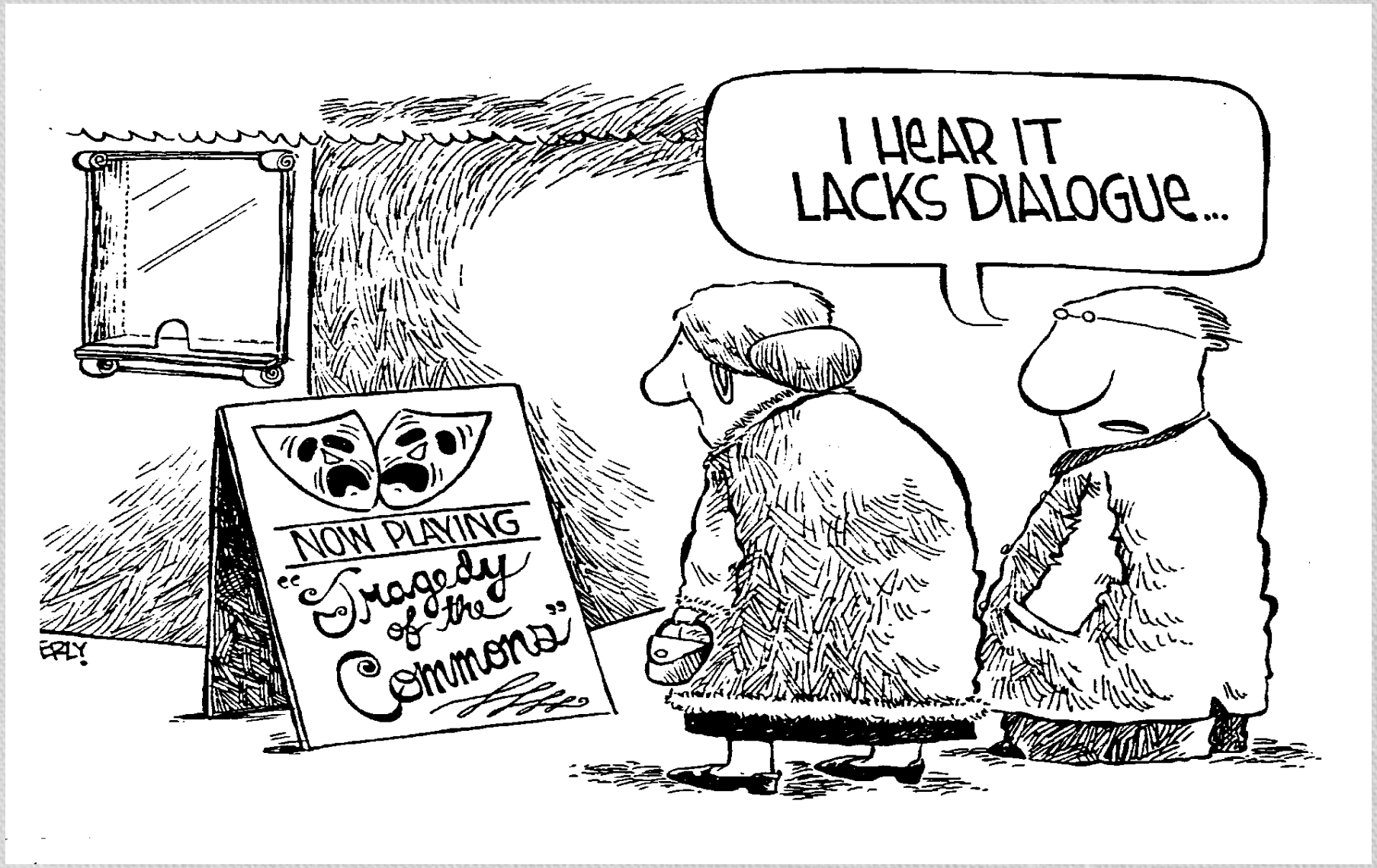
Changes in the biological components of the environment

- Plants, animals, insects — appearance of new species
- Plants, animals, insects — decreased diversity
- Plants (wild and crops) — changes in phenology
- Plants (wild) — change of vegetation
- Plants (wild) — decline of forests
- Plants (wild) — decreased abundance
- Plants (wild) — shifts of species range
- Plants (crops) — shifts of species range
- Plants (crops) — decreased yields and/or quality
- Animals — change in behaviour
- Animals (migratory birds) — decreased populations
- Animals — decreased populations
- Animals — increased populations
- Animals — increased incidence of diseases
- Animals (corals) — increased bleaching
- Pests and diseases (crops) — increase

- Tropical and subtropical moist broadleaf forests
- Tropical and subtropical dry broadleaf forests
- Tropical and subtropical coniferous forests
- Temperate broadleaf and mixed forests
- Temperate coniferous forests
- Boreal forests/taiga
- Tropical and subtropical grasslands, savannas, shrublands
- Temperate grasslands, savannas, shrublands
- Flooded grasslands and savannas
- Montane grasslands and shrublands
- Tundra
- Mediterranean forests, woodlands and scrub
- Deserts and xeric shrublands
- Mangroves
- Lakes
- Rock and ice

Savo et al. 2016. Observations of climate change among subsistence-oriented communities around the world. *Nature Climate Change* 6: 462-473.

3. Governing the commons: community conservation has to solve the two fundamental problems of commons (exclusion and subtractability) -- this requires communication



Notion of governance

- Governance as the broader arena in which institutions operate; used as the **more inclusive** term
- **Management** is about action; **governance** is about politics – sharing of responsibility and power, and setting the policy agenda and objectives (Kooiman et al. 2005 . *Fish for Life*)
- Policy level – in between
- Governance: not only for government managers
- Dividing lines between public and private sectors have become blurred in recent decades, as indicated by the phrase "public-private partnerships"

Adaptive governance: going beyond management

- Much of conventional management does not work because it is based on **assumptions of equilibrium and controllability** (Holling and Meffe 1996. *Conservation Biology*)
- And deals with one **sector** at a time
- Adaptive management includes **feedback learning,** taking **uncertainty** into account (Holling, ed. 1978. *Adaptive Environmental Assessment and Management*)
- But **ecosystem management** also has to take a broader view to become **interdisciplinary** and more **comprehensive** (Berkes 2012. *Fish and Fisheries)*
- That is, to become adaptive governance

Adaptive governance requires collaborative approaches because…

- Essential **unpredictability** of complex systems
- **Expert-knows-best** conventional science does not work well with complex systems (Ludwig 2001. *Ecosystems*)
- **Deliberating** on the important questions, research approaches and the resulting evidence requires **partnerships**
- Instead of the conventional managerial approach, we need adaptive governance with collaborative approaches
- **Collaborative/cooperative** approaches, such as **co-management** (sharing of power and responsibility between the government and local resource users) and **knowledge co-production**
- Collaborative approaches require learning together, facilitated by good leadership, networks

Coral reef restoration, Bali, Indonesia

- Live aquarium fish trade and the use of cyanide reached Bali in the 1980s
- By the 1990s, coral reefs were in crisis, as cyanide kills reefs
- Impacted fishing livelihoods
- New live fishing techniques were introduced in Les, Bali, in 2000 by NGOs
- Reef restoration undertaken
- Success at Les exported to other communities by networking

Coral reef case: factors of success

- Availability of cyanide-free fishing technology
- Capacity-development in the community – learning how to use new technology and co-producing knowledge
- Establishment of a new institution (Ornamental Fishers' Assoc) for collective action and to prevent TOC
- Facilitated by social learning, good leadership, networking

(Frey and Berkes 2017. In: *Governing the Coastal Commons*)

4. Responding to change: resilience

- "Capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity and feedbacks" (Walker et al. 2004 *Ecology & Society*)
- A resilient SES has the ability to respond to **shocks** and **stresses**, while maintaining the functioning and identity of the system
- For example, a herding community still stays as a herding community, while making adjustments to deal with shocks (e.g., theft of cattle) and stresses (e.g., climate change)

Resilience: innovative responses to change

- In general, resilient systems have the ability:
  (1) to absorb shocks and stresses
  (2) to self-organize
  (3) to learn & adapt
- Living in a rapidly changing world, resilience becomes important, especially in resource-dependent communities
- Persisting, adapting or transforming under change:
  - How is the community **coping** with change?
  - Does the community have the flexibility to **adapt** to change?
  - If coping and adapting are no longer possible, does the community have the capacity to **transform**?

Resilience may be considered to include coping capacity, adaptive capacity, and transformative capacity

Béné et al. 2014. *Journal of International Development* 26: 598-623.

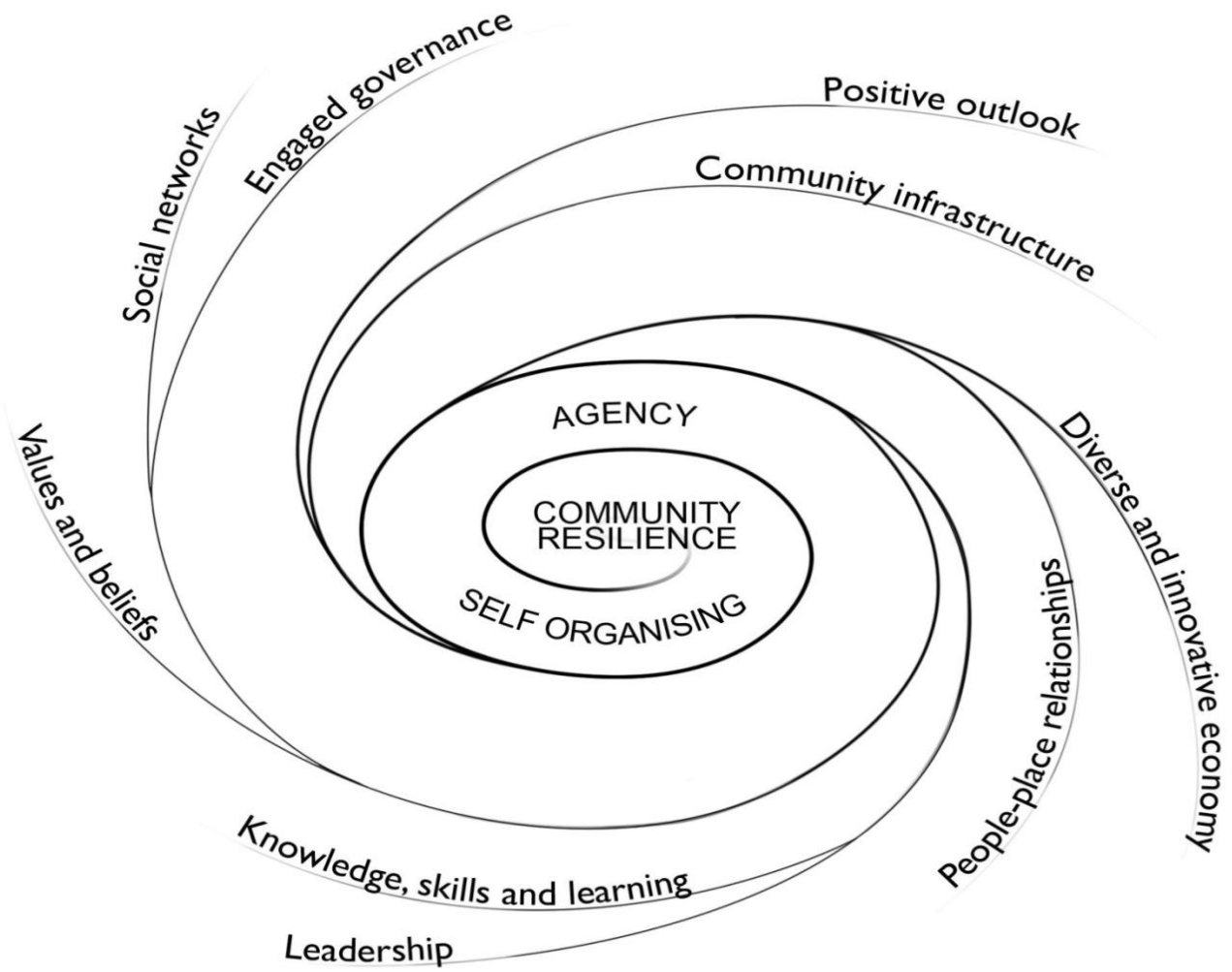
Brown, K. 2016. *Resilience, Development and Global Change*. Routledge.

Building resilience in general, theoretical considerations (Folke et al. 2003 In: Navigating Social-Ecological Systems)

Four clusters of factors for building resilience:

- learning to live with change and **uncertainty**
- nurturing ecological, cultural and economic **diversity** for increasing options and reducing risks
- increasing the range of **knowledge** for learning and problem-solving, and
- creating opportunities for **self-organization**, including fostering social memory; strengthening local institutions, building linkages and problem-solving networks

Community resilience: build on existing strengths, based on empirical findings (Berkes and Ross 2013 *SNR*)



Participatory research methods build community resilience (Ross & Berkes 2014. *SNR*)

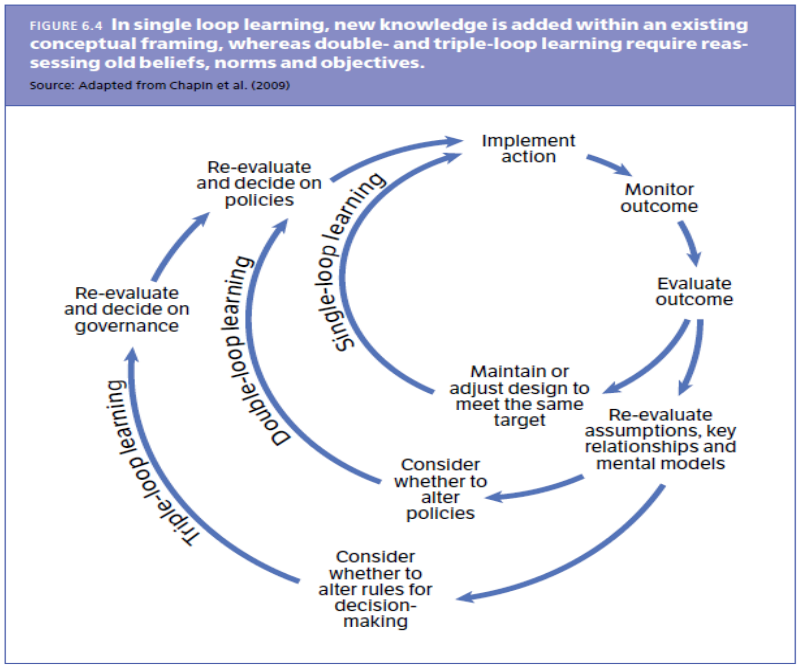
- … by helping communities increase their own understanding of change through research, reflection and applied learning
- POPA: participatory research and public engagement in Uruguay (Trimble & Berkes 2013. *JEM*)
- **Actor networks** sharing management responsibility: iterative, collaborative, feedback-based problem-solving (Olsson et al. 2004. *Env Mgmt*)

Self-organization and **knowledge production**: Port Mouton Bay, Nova Scotia. Fishers and independent scientists re: aquaculture impacts on local fishery

Social learning for resilience and governance: a hot area for research

Double and triple-loop learning requires re-assessing old beliefs, norms and objectives

Learning comes naturally: age, education level, ethnicity etc. are not barriers!



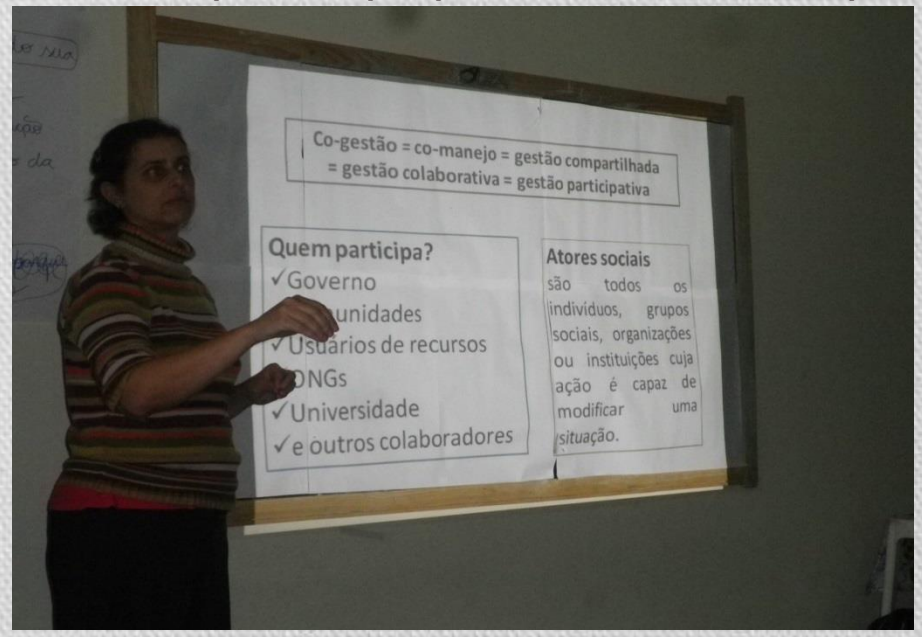
Arctic Resilience Report 2016 p. 156

5. Re-evaluate and prescribe improvements

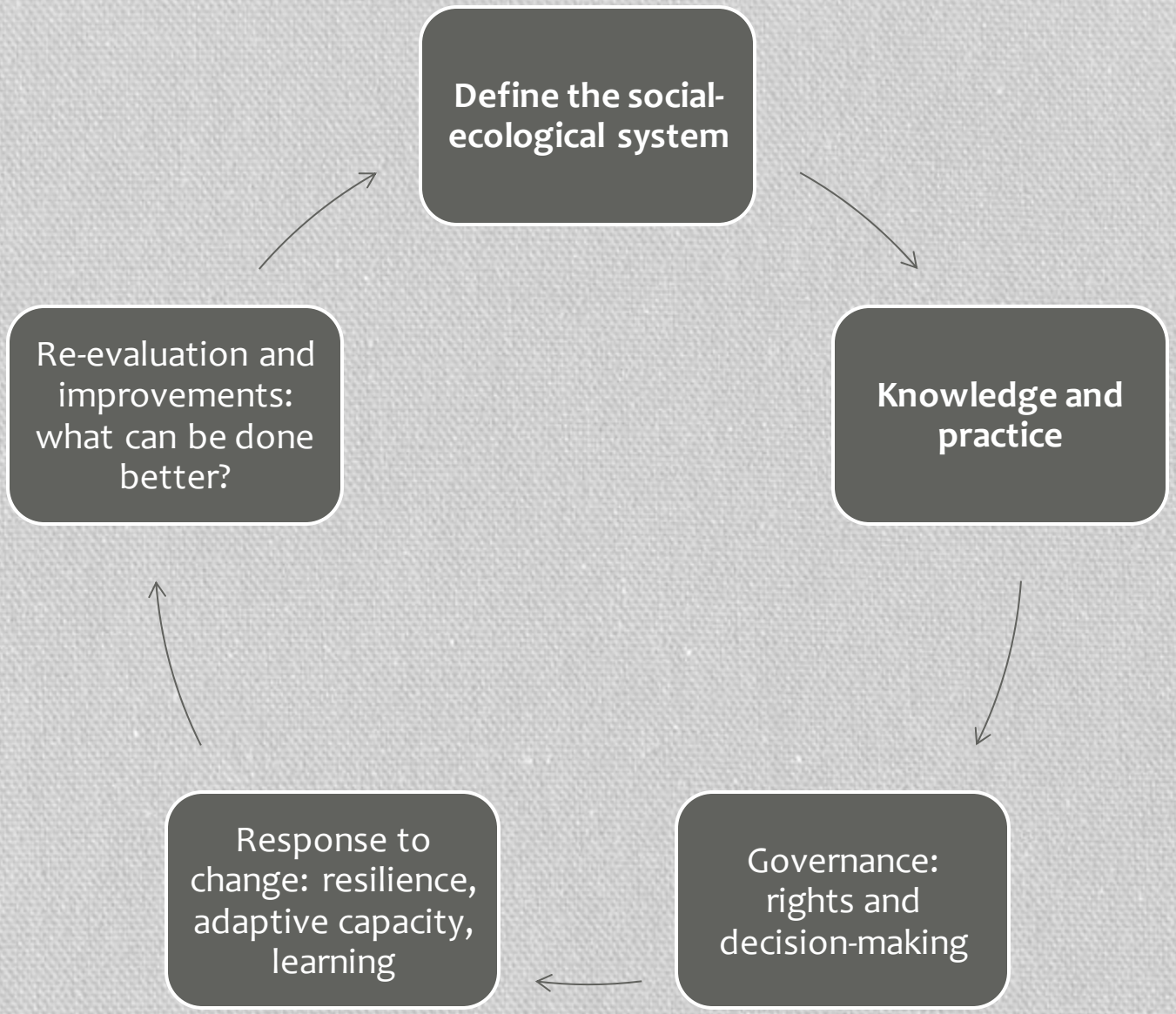
What can be done better?

- In defining the SES: missing user-groups? Telecoupling?
- Knowledge requirements; making better use of existing knowledge; knowledge co-production
- Governance arrangements; enabling policies and legislation; institutions and their linkages; clarifying rights and rules
- Responding to change; resilience-building; social learning and its various components such as social memory
- Each case of community conservation is unique
- But all cases tend to have in common: capacity development needs ("Two to tango" about capacity needs in co-management, Pomeroy & Berkes 1997. *Marine Policy*)

Capacity development in the Paraty project, Brazil: working with local organizations to help them prepare themselves for protected area negotiations with government



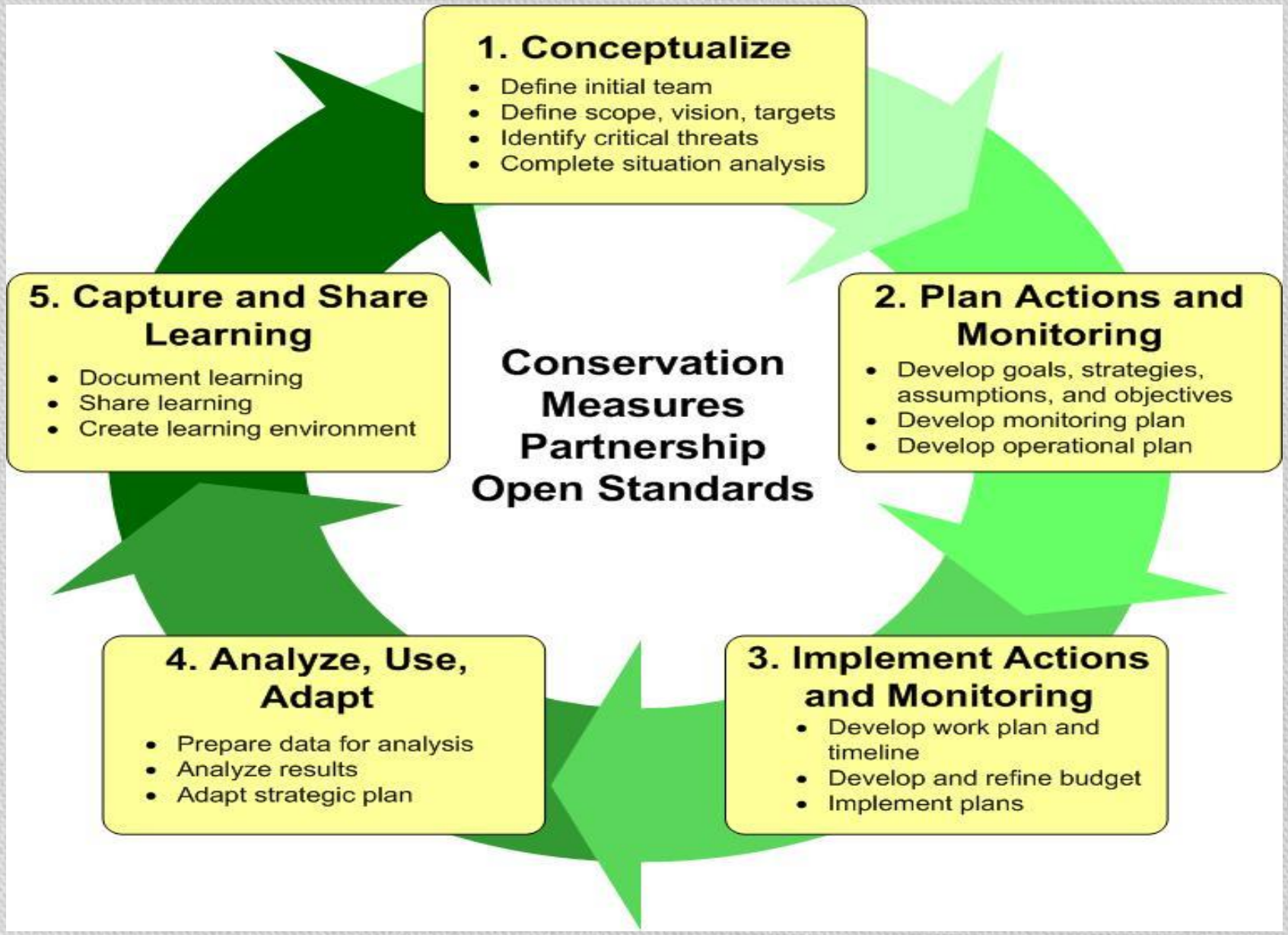
Putting it all together: **Community conservation assessment cycle**



Conclusions I

- Community conservation – first and foremost, a **commons** problem
- Communities need to have secure control over their resources for conservation to be viable
- 'Community conservation assessment' helps understand it, analyze it, possibly improve it
- Importantly, it can help look for **intervention points** and **anticipate problems** in a rapidly changing world
- Emphasis on resilience, adaptive capacity, learning makes community conservation assessment **dynamic**
- Note also that this assessment is a never-ending process; it is **a cycle**

Adaptive management (learning-by-doing)



Conclusions II

- Relevant lessons: although the focus here is on conservation, one can adapt this kind of planning cycle to focus on **livelihoods**, or **Indigenous cultures**, or …
- We have the tools to understand what works and what doesn't
- This meeting: how local communities are engaging in conservation supporting sustainable livelihoods
- How they can be best supported by policies and interventions
- Together (Indigenous, community, university, government, and NGO people), we are in a position to shape future linkages of communities, conservation and livelihoods.

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