Knowledge Synthesis Methods

19. Collaborative Adaptive Management

Summary of method

Collaborative Adaptive Management (CAM) is a structured/flexible, stepwise, transparent approach that includes the iteration of knowledge synthesis, most often using collaborative methodologies, such as participatory scenario building, joint fact-finding and/or multi-criteria analysis. New knowledge is then generated, through the selection, application and monitoring of policies or management strategies.

CAM differs from other knowledge synthesis methods in a key aspect. Instead of aiming to identify single, broadly-applicable, optimal solutions, it aims to identify flexible solutions that are resilient to errors and uncertainty. The initial phase of CAM represents a specific type of knowledge synthesis, but the overall approach goes beyond synthesis to locally or specifically relevant knowledge generation.

Key references

The following methodological tools and guidance are available to support and guide implementation of CAM.


The NeWater project (European Comm. Contract No 511179) and the Global Water System Project provide an online course in Adaptive Management for water resources: http://www.newatereducation.nl/

Examples of application

The US Department of Interior used CAM to carry out its responsibilities under the Grand Canyon Protection Act of 1992 to monitor the operation of the Glen Canyon Dam and mitigate any significant environmental impacts. There is not agreement over whether this landmark example of CAM was a success, or achieved its environmental objectives. Susskind et al. (2012) argue that it was not a success, because the process was flawed and best practice was not followed. Specifically, they argue that joint fact-finding should be used as part of CAM, to deal with scientific uncertainty.

---

Other examples of CAM used to improve the governance of water resources management and wetland conservation are presented in Méndez et al. (2012) and Kallis et al (2009).

Useful reviews of the utility and practical implementation of Collaborative Adaptive Management are provided by Westgate et al. (2013), Scarlett (2013) and Susskind et al., (2012).


### Collaborative Adaptive Management

**Cost**

Staff (3-12 months FTE if restricted to diagnosis and planning; 12-48 months FTE including a first learning-by-doing cycle), travel and subsistence (for workshops and, if necessary, to interview stakeholders), software (for complex issues requiring knowledge-mapping visualization and/or dynamic modelling tools), expert (facilitation of collaborative knowledge mapping or collaborative modelling, incl. visualization tools)

Affected by: available evidence; knowledge gaps and uncertainties; need for specialist expertise; complexity of the question; Capacity for conflicts among agencies and/or stakeholders

**Time required**

3-12 months if restricted to diagnosis and planning

24-60 months including a first learning-by-doing cycle

Affected by: number and scale of interventions/actions, complexity of socio-natural system, availability of staff, response time

**Repeatability**

High (if done and recorded, and archived properly)
**Transparency**
High (if properly done). CAM is specifically designed to ensure transparency, legitimacy and trust among stakeholders

**Risk:** In the absence of adequate design and implementation of collaborative work, AM may be used to obscure rather than address underlying conflicts - thus reducing transparency

**Risk of bias**
Low (if done well and with enough time/resources). CAM acknowledges bias as inherent to knowledge and designs learning-by-doing strategies to evaluate inherent assumptions, thus reducing the risk of failure

**Scale (or level of detail)**
Independent of scale (any)

**Capacity for participation**
Very high (if done well). All key stakeholders involved in collaborative modelling and decision-making. Several opportunities for open consultation and/or participation along the diagnostic phase and learning cycle

**Data demand**
Low in the initial phase, though it should aim to include all relevant information, know-how and expertise available. High in the implementation (learning-by-doing) phase

**Types of knowledge**
All

**Types of output**
Collaborative knowledge maps, identification of uncertainties and knowledge gaps, adaptive management strategy, policy briefs
These outputs can be presented user-friendly written reports, interactive website of narrative evidence, short documentary films and/or other communication materials

**Specific expertise required**
CAM specialist (incl. interviewing and facilitation), topic expert, modelling specialist
<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholders are involved in a proactive, structured way</td>
<td>Depends on trust and willingness to participate, as all stakeholders must be involved</td>
</tr>
<tr>
<td>High transparency and participation</td>
<td>Implementation of learning-by-doing cycle depends on sufficient top-down and bottom-up support</td>
</tr>
<tr>
<td>Allows for a way forward when insufficient evidence precludes the identification of an optimal solution</td>
<td>Needs agreement on an overarching goal and how to measure progress towards it</td>
</tr>
<tr>
<td>Designed to accommodate to counterintuitive effects, uncertainty and evolving circumstances</td>
<td></td>
</tr>
<tr>
<td>Designed to handle differing views and facilitate conflict resolution, though it might be challenging in wicked problems and longstanding socio-environmental conflicts</td>
<td></td>
</tr>
</tbody>
</table>