WATER for AGRICULTURE

Fact Sheet: Single-, double- and triple-loop learning

Single-loop Learning

- Requires trust, risk-taking and the opportunity for individuals to become vulnerable.
- A matter of simply following the rules and not questioning underlying assumptions.
- **Asks the question:** "Are we doing things rights? (Medema et al., 2014)
- EXAMPLE: In an attempt to address water quality issues, individuals may request improvements to a local city ordinance on nonpoint source pollutants (NPSP).

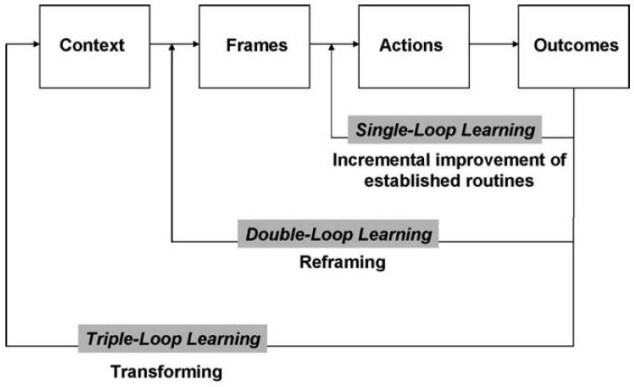
Double-loop learning

- Questioning of the status quo which includes, but is not limited to institutions, ideologies, assumptions, rules, and procedures.
- Revisiting earlier assumptions which may involve a departure from the norm.
- May require reframing of the issue and potential solution.
- **Asks the question:** "Are we doing the right things?" (Medema et al., 2014)
- EXAMPLE: In dealing with water quality, this may involve requiring more up-to-date mechanisms used to remove NPSP from the public water supply.

Triple-loop learning

- An acknowledgement that the "rules" are part of a broader system and may requires a redesign of the context or structure upon which the rules are decided.
- Requires a transformation or shift in paradigm, underlying norms, and behaviors.
- **Asks the question:** "How do we decide what is right?" (Medema et al., 2014)
- EXAMPLE: To improve the quality of the public water supply, this shift may include engagement with water polluters (industry, agricultural sector, hazardous waste sites, etc.) to identify workable solutions to reduce NPSP levels as opposed to a heavy-handed regulatory approach.

Sequence of learning cycles in the concept of triple-loop learning (Pahl-Wostl, 2009, p. 359)



Comparison of Three Loops of Learning (Flood & Room, 1996)

	Single-loop learning	Double-loop learning	Triple-loop learning
Purpose	Effective problem solving	Questioning fundamental assumptions	Continuous inquiry for timely action
Type of question asked	What	How	Why
Process	Revising methods and tactics	Reframing problems and situations	Re-creating visions and intentions
Dimension	Behavioral (doing)	Cognitive (knowing)	Existential (being)

Multi-loop Learning

- The use of multi-loop social learning is one indication of a community's adaptive capacity ability as its understanding or recognition of the limits of "existing institutions and mechanisms of governance" (Medema et al., 2014, p. 26).
- Single-, double-, and triple-loop learning can be viewed as a reflexive process which may eventually result in behavioral change within land and water resources management.

Who can assist with multi-loop learning?

- **Facilitators**
- **Boundary spanners**: Individuals who have the capacity to reach across organizational boundaries to build relationships and multi-disciplinary connections to solve complex problems *(van Meerkerk & Edelenbos, 2019) as well as* encourage or foster *mutual learning* among research, policy and practice *(Maag et al., 2018).*

Individual attributes for double- and triple-loop learning

Drivers and conditions for double- and triple-loop social learning.

Double-loop and Triple-loop Social Learning			
Individual Attributes	Process Factors	Internal Context	External Context
Tolerance of ambiguity [80,82]	Promoting system orientation and system thinking [27,41]	Vertical and horizontal integrated cooperation through networked governance [21,108,113]	change and uncertainty [8,111,112,121]
Openness and commitment to change and learning [79,148]	Facilitating institutional interplay [107,108]	Innovative learning structures and partnerships [21,36,51,87,109,125,126]	Political support and buy-in [8,111,112]
Capability for critical self-reflection [21,49,79,114,149]	Extended participation and engagement [27,41,137]	Commitment to ongoing multi-loop social learning [41,49]	National and regional funding and support instruments [114]
Locus or perceptions of power and control [81,111]	Co-management through collaboration and negotiation [27,41,107,109]	Sound knowledge base and (technical) capacity [3,12–14,112]	Supportive regulatory frameworks [8,111,112,114,121]
Flexibility and open-mindedness [111,150,151]	Developing bridging organizations that facilitate integration and synthesis of knowledge [5,41,107,110,138]	Emergent leadership with clear vision [111,114,124]	
Reliable, consistent and respectful of others' viewpoints [49,148]	Facilitating ongoing reflection & reflexivity by embracing an intentional approach to learning [5,41,86,87,94,139,140]	Advanced information management [42,112,126]	
	Creating an enabling and democratic environment characterized by informal and open discourse [21,41,49,114,124]	Dealing with sustainability management issues from a regional scale level [34,49,131,132]	
	Following rules and principles of dialogue [27,41]		
	Building trust, good will and mutual understanding [49,111,]		

(Medema et al., 2014)

Things to keep in mind…

- Double-loop learning may only be effective when in combination with triple-loop learning as structural content often influences process factors and, in turn, value and beliefs. This often requires changes within internal and external contexts which is difficult to control (Medema et al., 2014).
- Social learning is essential to the development of adaptive capacity as it encourages stakeholders to negotiate goals through feedback loops, reframing of issues, and collaboration with others.

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