

# What does it mean to have a systems perspective on policy development and evaluation?

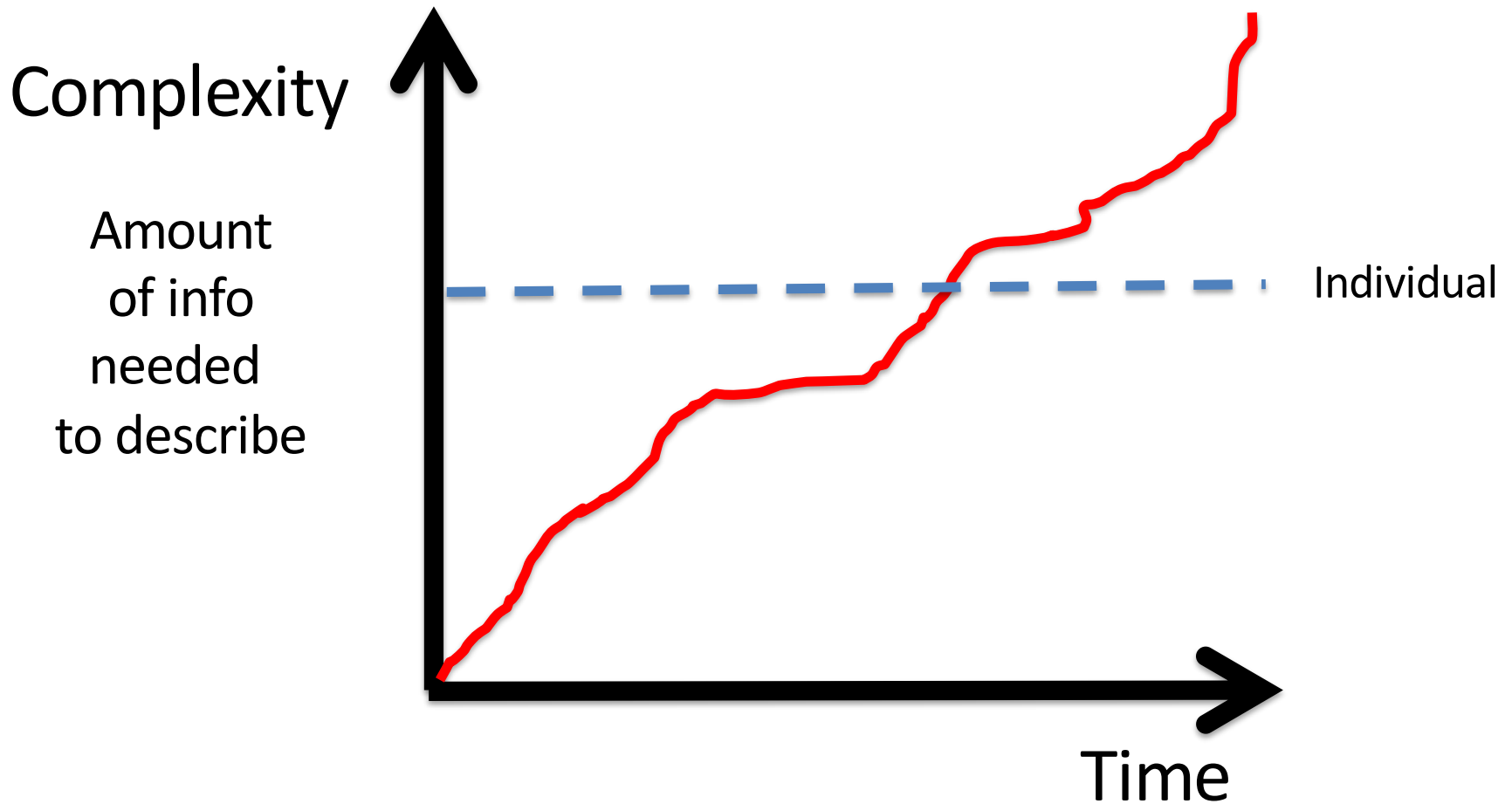
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# Complexity is rising



# Edge of chaos?



# Common responses to complex problems

- Retreat
- Despair
- Believe the problem is beyond hope
- Assign blame, figure out who is responsible
- Simple solutions
- Galvanize our collective response and invest significant resources

# Key Messages

- Complex systems/problems are not the same as simple or complicated systems/problems.
- *Approaches* to complex/wicked problems are not the same as *solutions* to simple or complicated problems.
- Systems thinking is needed when defining the problem to be solved, implementing interventions and when assessing their impact.

# Complex is not the same as complicated

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| Simple | Complicated | Complex |
|--------|-------------|---------|
| Cake   | Rocket      | Child   |

# Characteristics of Systems

| <b>Simple or Complicated Systems</b>       | <b>Complex Systems</b>       |
|--|------------------------------|
| Homogeneous                                | Heterogeneous                |
| Linear                                     | Nonlinear                    |
| Deterministic                              | Stochastic                   |
| Static                                     | Dynamic                      |
| Independent                                | Interdependent               |
| No feedback                                | Feedback                     |
| Not adaptive or self-organizing            | Adaptive and self organizing |
| No connection between levels or subsystems | Emergence                    |

|                    | Simple                | Complicated                            | Complex  |
|--------------------|-----------------------|--|--|
|                    | Bake cake             | Rocket to moon                         | Raise a child  |
| Problem definition | Clear                 | Some uncertainty                       | Lots of uncertainty  |
| Rules              | Same apply every time | Continuously improved until repeatable | No direct transference from context to context               |
| Expertise          | Not really required   | Requires high levels in specific areas | Not needed to develop a common understanding; may be helpful |
| Success            | Follow protocol       | Experiment to develop protocol         | Adaptation and continuous learning                           |

# Simple?



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# Complex?



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# We need to start thinking differently

|                            | Reductionist           | Systems Thinking  |
|----------------------------|------------------------|---|
| Problem exploration        | Isolate parts          | Explore emergent nature of the whole                                |
| Goal                       | Solve a problem        | Develop shared understanding of problem, approach, progress         |
| Nature of problem          | Understood objectively | Multiple causes, no single solution, perspective and context matter |
| Responsible to take action | Others                 | Everyone  |

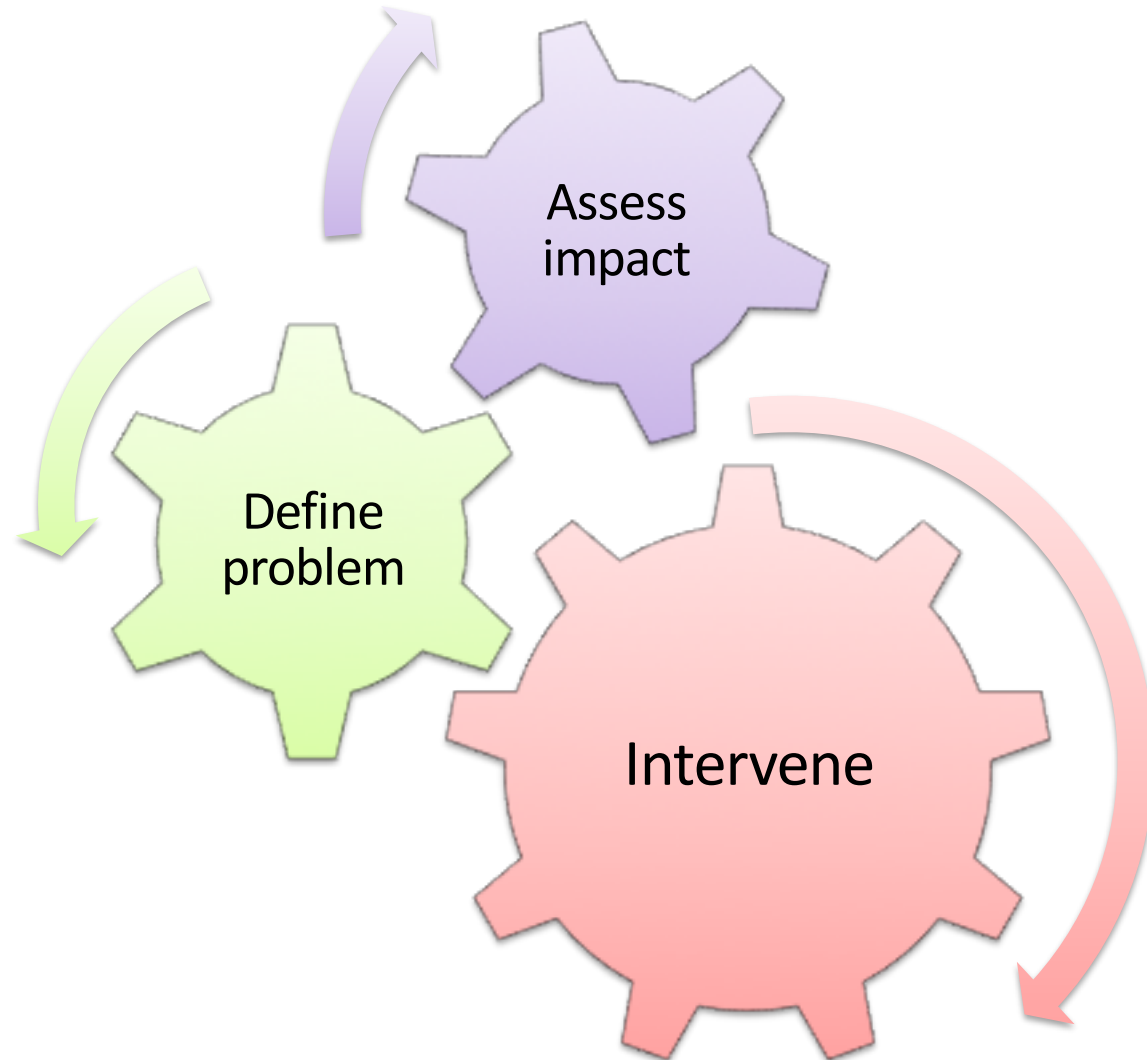
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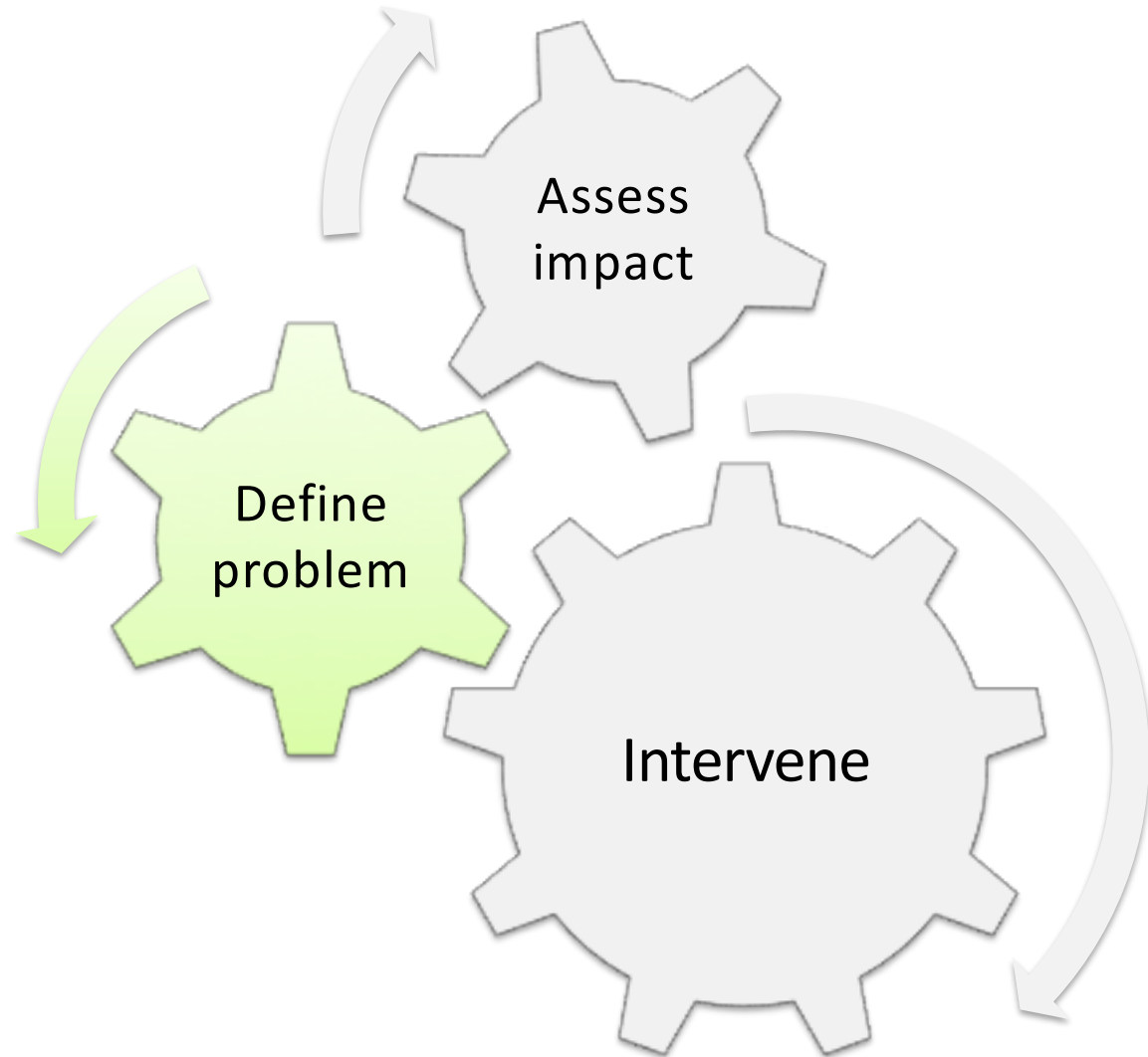
# Systems Thinking

- Set of analytic skills used to improve capability of identifying and understanding systems, predicting their behaviors, and devising modifications to produce desired effects (Arnold & Wade, 2015).
- Way to make sense of a complex system that gives attention to relationships, boundaries and perspectives. A mental framework that helps us to become better at addressing complex problems. Find ways to shift or recombine parts to offer improved outcomes (Adapted from [TAPPC](#)).

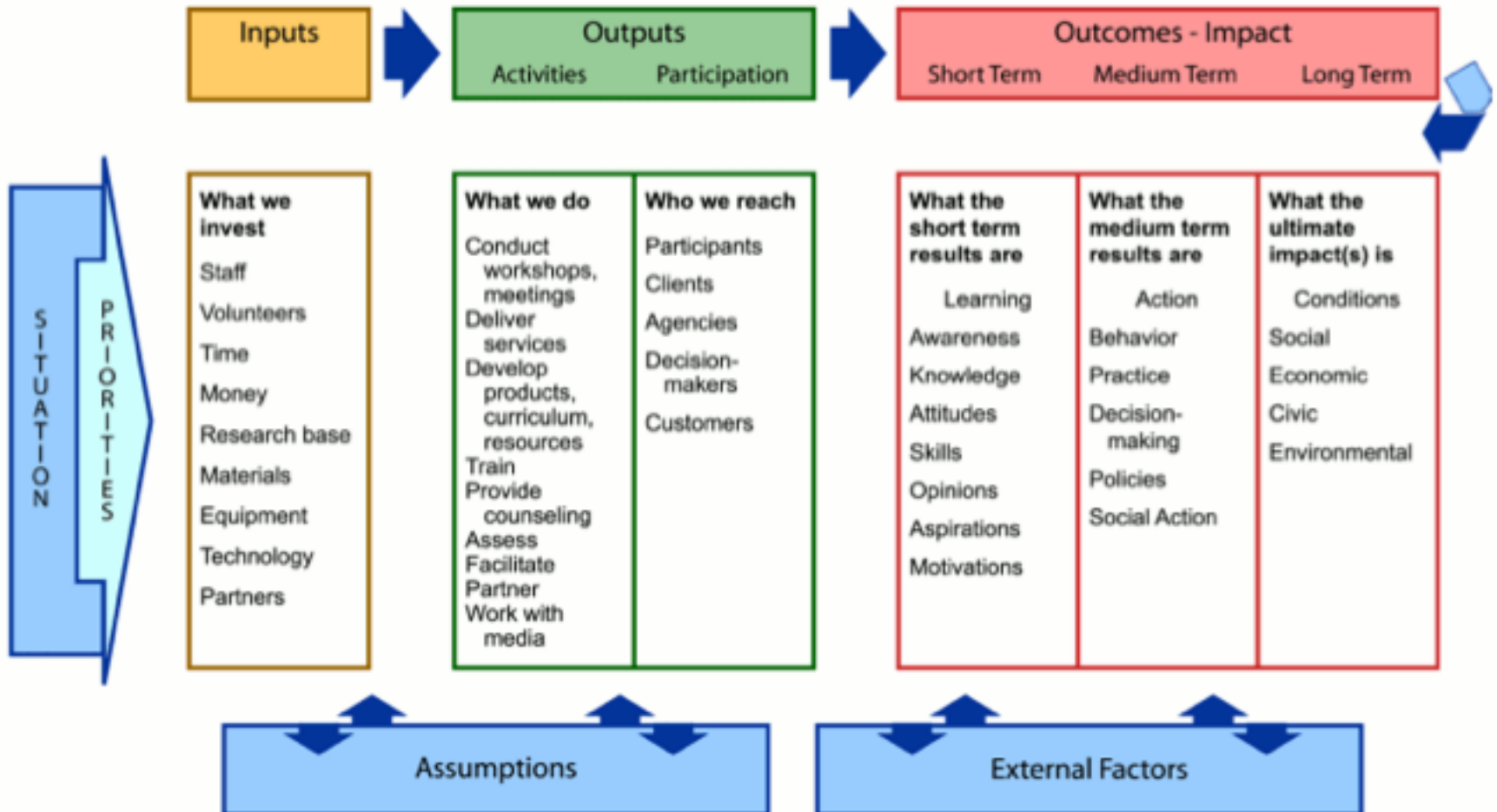
# Domains for a systems approach



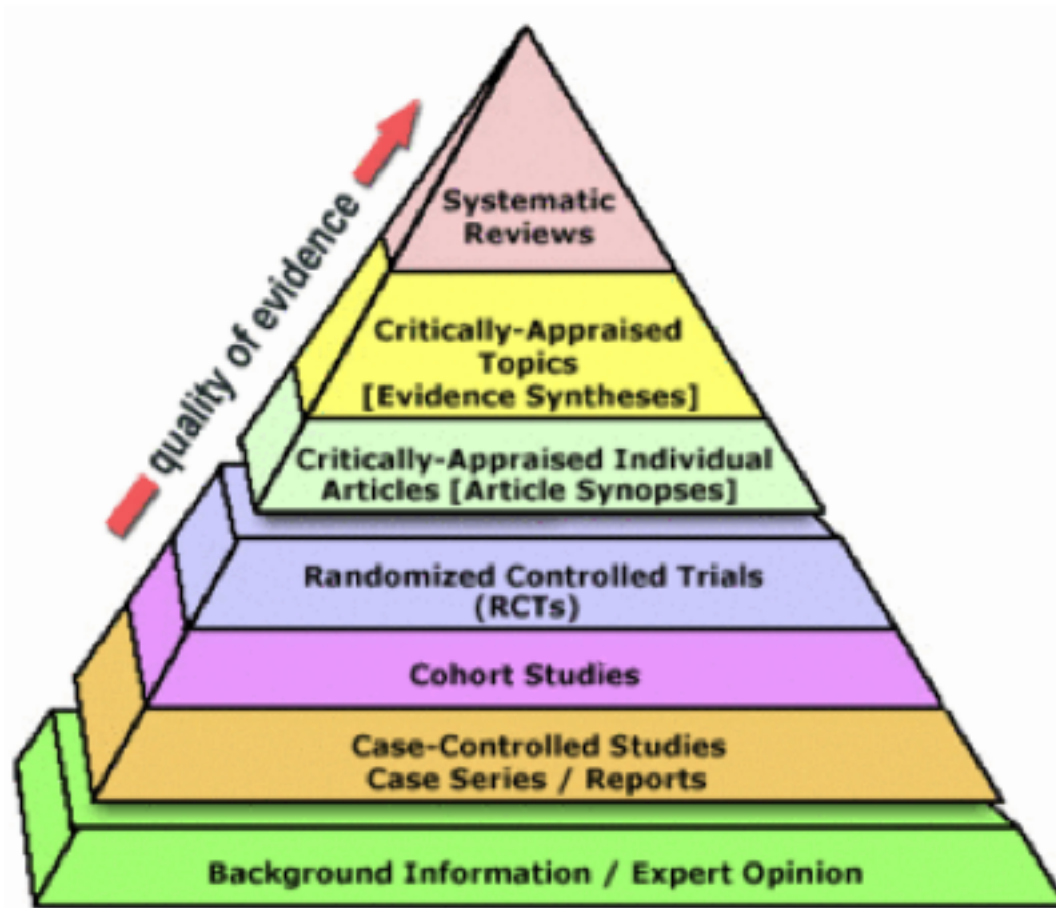
# Domains for a systems approach



# Linear logic models suggest a problem is only complicated



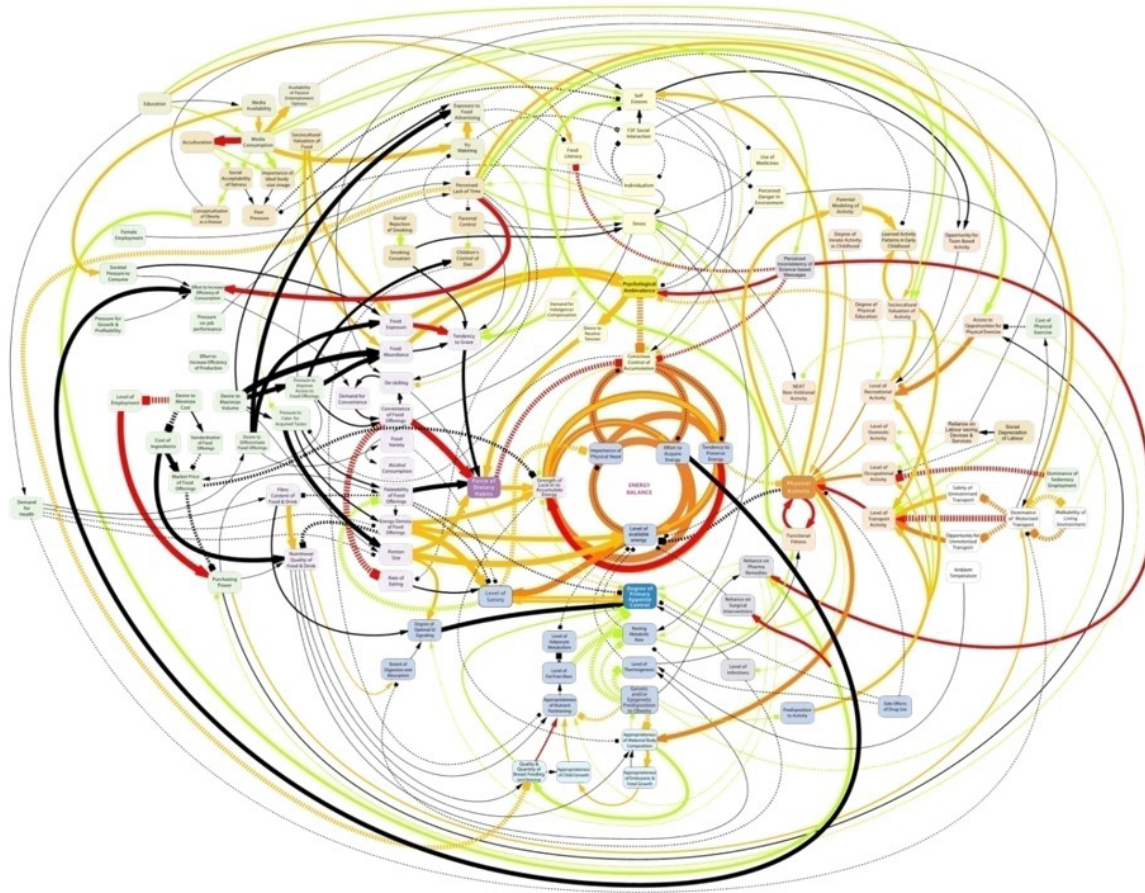
# Evidence-based medicine is built on a reductionist paradigm



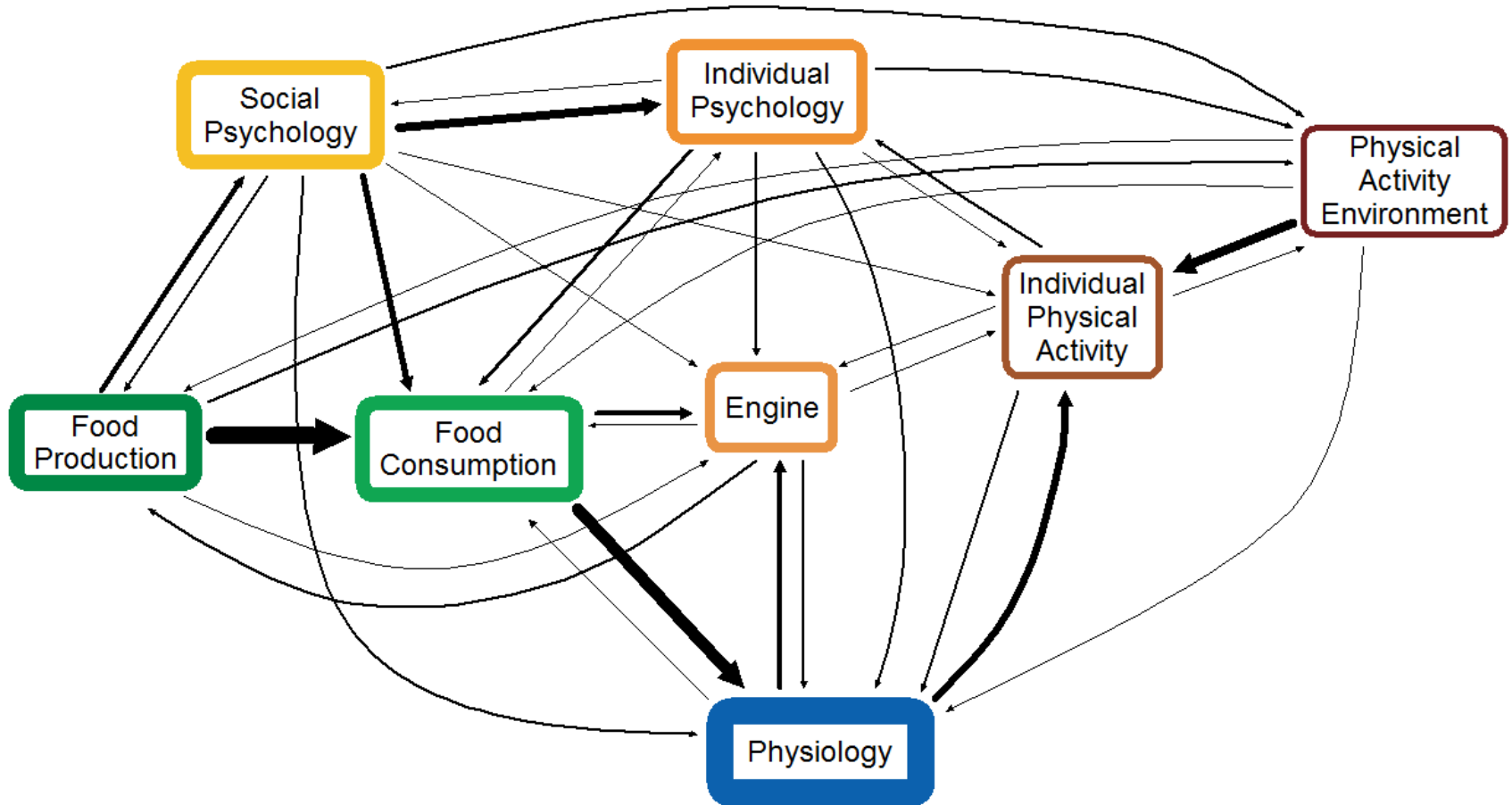
# Social ecological models do not emphasize interdependencies



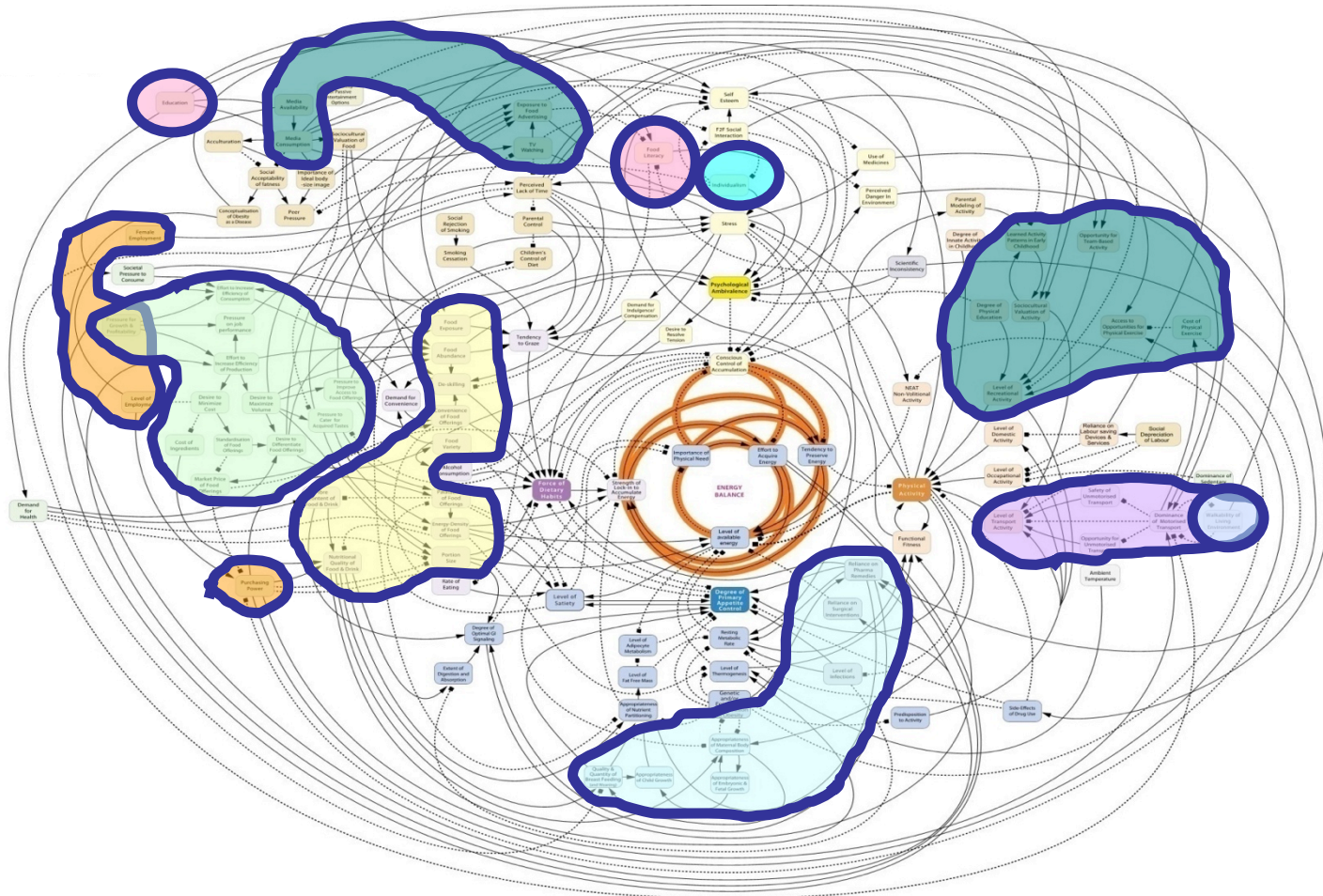
# Causal loop diagrams emphasize interdependencies



# Problem definition depends on who is in the room



# Problem definition *and resolution* are concomitant



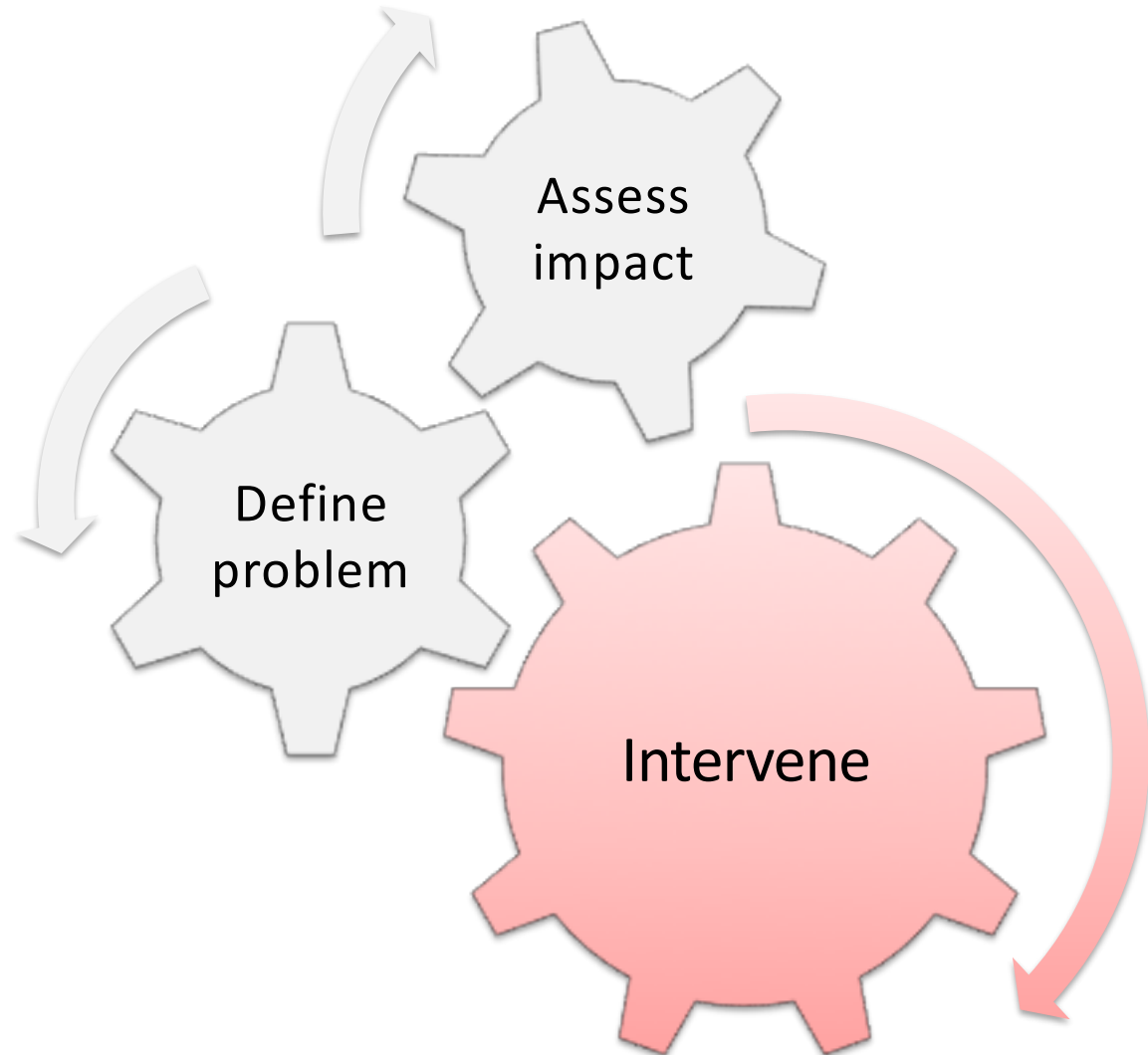
# “Defining” Methods and Tools

- Causal loop diagrams
- Concept mapping
- Network mapping
- Visual/Graphic mapping
- System effects mapping
- Fuzzy cognitive mapping
- Intervention level framework
- Group model building
- Delphi methods

# Principles for problem definition

- Develop a shared understanding among stakeholders
- Use heuristics that reflect relevant aspects of complexity
- Work on problem definition and problem resolution together
- Use methods and tools that support co-creation

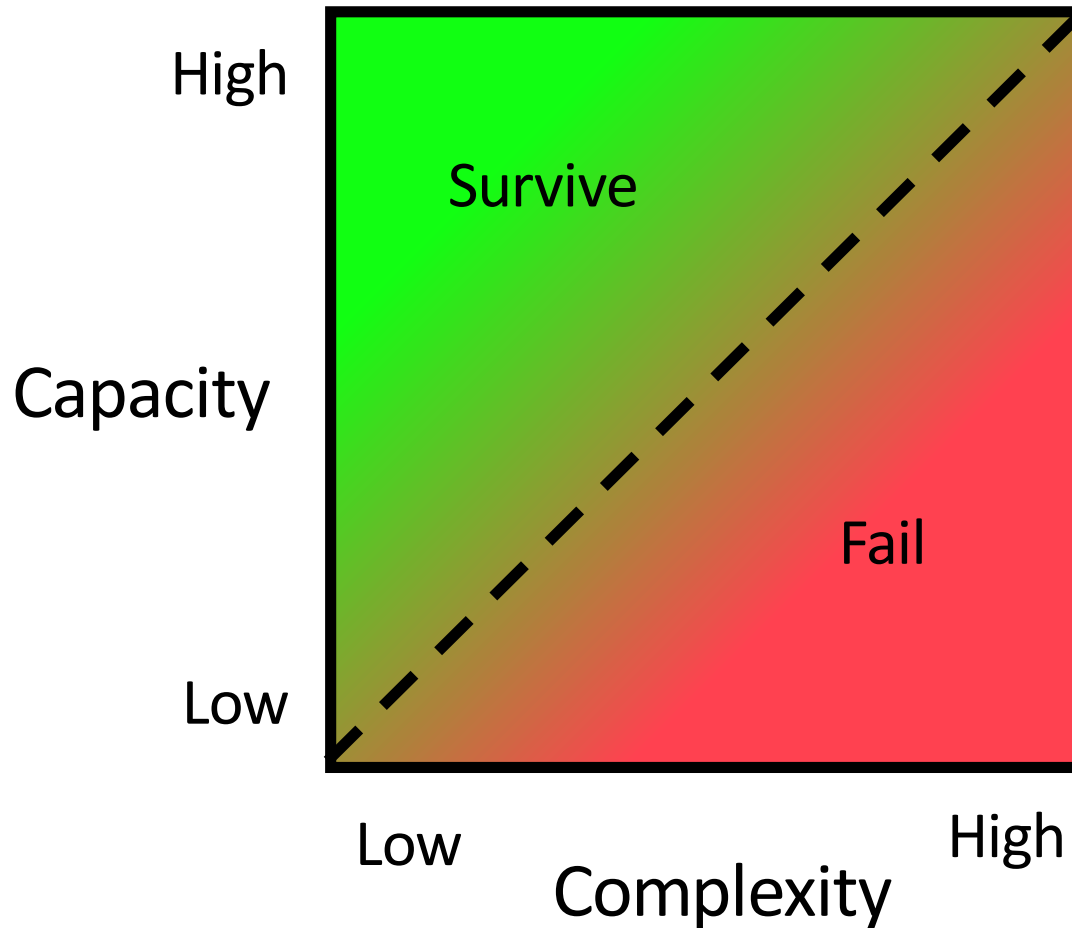
# Domains for a systems approach



# Systems Approaches to Intervention

- Support individuals / individuals matter
- Match capacity to complexity
- Set functional goals; focus on principles that GUIDE
- Distribute decision, action, & authority
- Separate simple and complex processes
- Establish networks and teams
- Build authentic trust
- Utilize the relationship between cooperation and competition
- Act locally, connect regionally and learn globally
- Move from “let it happen” or “make it happen” to help it happen

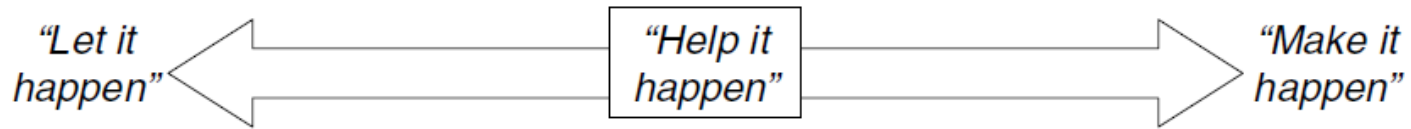
# Match capacity to complexity



# Influence Emergence

- **Stage 1 – Networks:**
  - self-organized, based on self interest
  - have fluid membership
- **Stage 2 – Communities of Practice:**
  - also self-organized, but people commit to be there for each other
  - used to share knowledge and to intentionally create new knowledge
  - good ideas move rapidly amongst members
- **Stage 3 – Systems of Influence:**
  - can't be predicted; sudden appearance
  - pioneering efforts at the periphery suddenly become the norm
  - policy/funding debates include perspectives/experiences of pioneers
  - critics suddenly become chief supporters

# Spread innovation



## *Defining Features*

Unpredictable,  
unprogrammed,  
uncertain, emergent,  
adaptive, self-  
organizing

Negotiated,  
influenced,  
enabled

Scientific, orderly,  
planned, regulated,  
programmed,  
systems “properly  
managed”

## *Assumed Mechanism*

Natural,  
emergent

Social

Technical

Managerial

## *Metaphor for Spread*

Emergence,  
adaptation

Knowledge  
construction,  
making sense

Diffusion

Negotiation

Knowledge  
transfer

Dissemination,  
cascading

Re-  
engineering

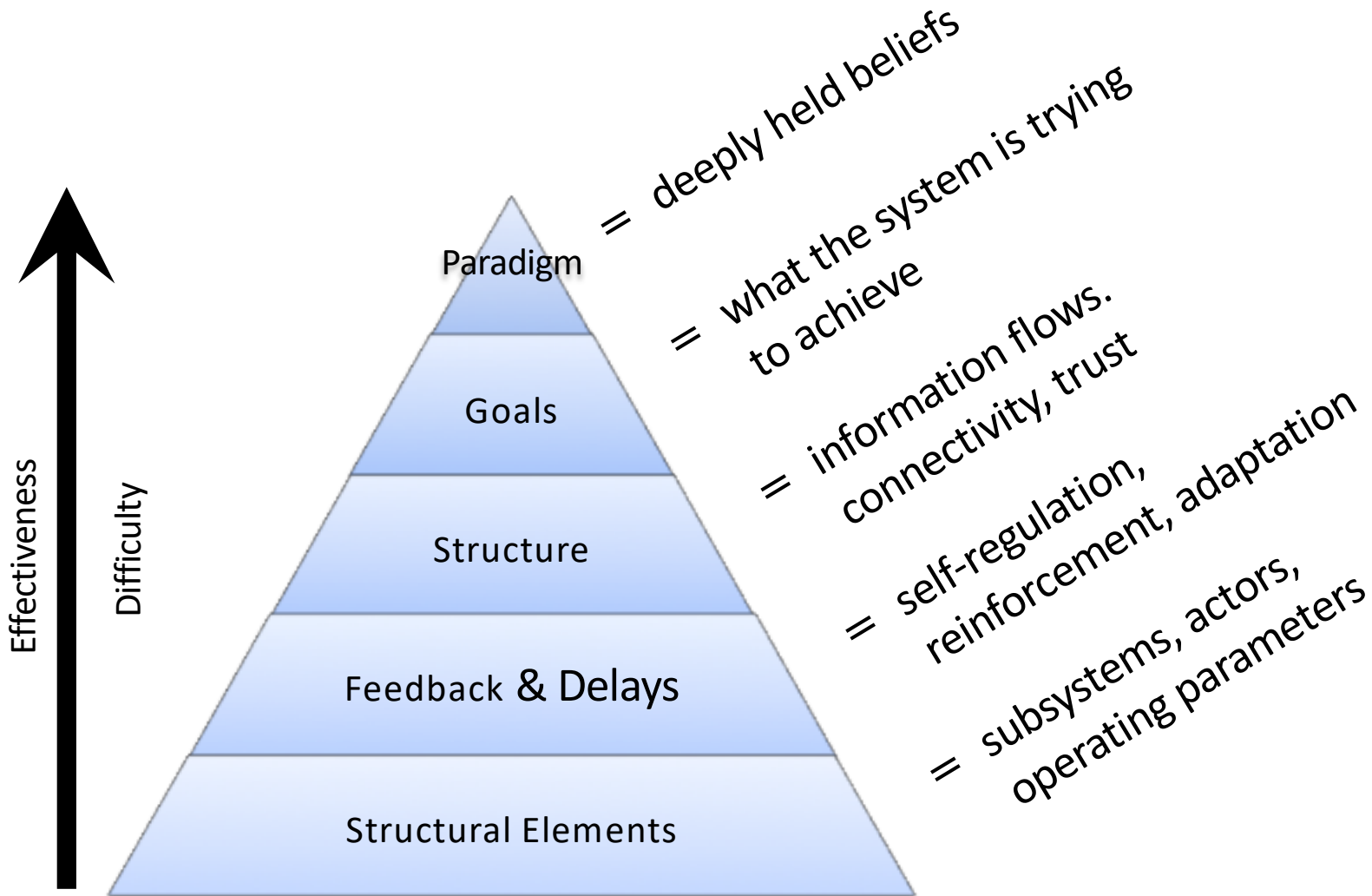
# Build trust to reduce complexity

- **Simple Trust**
  - Devoid of suspicion, demands no reflection, no conscious choice
  - Can't be recovered if it is lost
- **Authentic Trust**
  - Mature, articulated, carefully considered
  - Recognizes possibility of betrayal and disappointment
  - Must be continuously cultivated
- **Cordial Hypocrisy**
  - Façade of goodwill and congeniality that hides distrust and cynicism
  - Destructive to teamwork
  - Makes honest communication impossible

# Consider a spectrum of partnerships

| Sponsorships         | Alliances                 | Partnerships          |
|----------------------|---------------------------|-----------------------|
| independent          | interdependent            | interconnected        |
| transactional        | collaborative             | co-ownership          |
| information exchange | resource exchange         | resource optimization |
| low cost, low risk   | limited costs, staff time | leverage leadership   |
| equity valued        | equity needed             | equity is core        |

# Consider intervention levels



# GUIDE for Principles

## Guiding

- Prescriptive, directional – provides advice, guidance, specifies direction, informs priorities
- Effectiveness-oriented – “Do this...” to be effective
- Distinctive from its opposite or alternative

## Useful

- Points toward desired results; describes how to be effective
- Supports making choices and decisions
- Utility resides in being interpretable, doable, feasible and actionable

## Inspiring

- Values-based, ethically grounded
- Meaningful
- Is important, evokes a sense of purpose

## Developmental

- Context sensitive
- complexity adaptable
- Enduring (not time-bound)

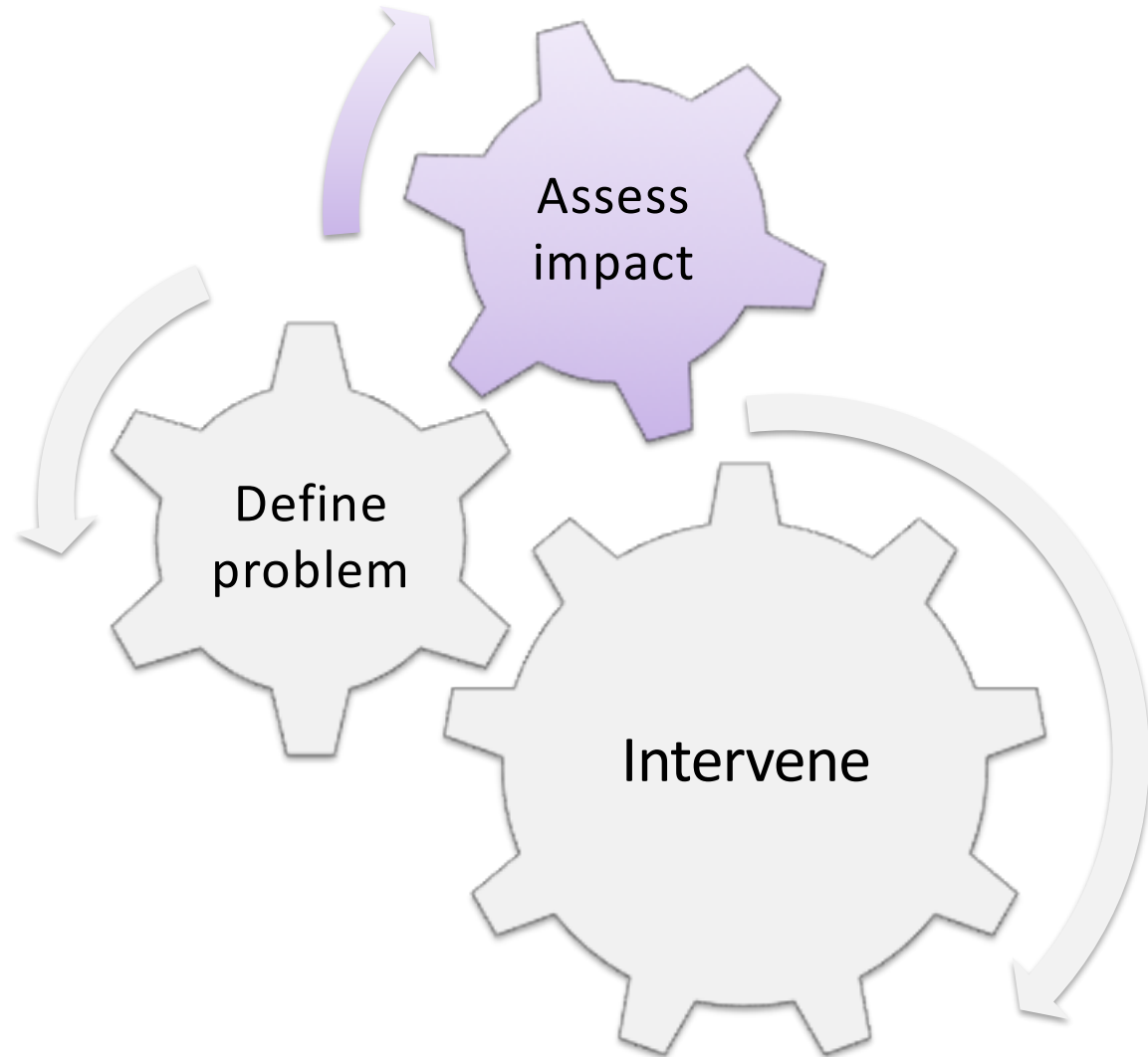
## Evaluable

- Can document and judge whether it is followed
- Can document and judge what results
- Can determine if it takes you where you want to go

# Principles for intervention

- Focus on matching capacity and complexity for individuals/organizations in the system
- Influence emergence by nurturing and enabling networks to become communities of practice
- Build authentic trust to reduce the complexity of working in partnership
- Attend to higher levels (paradigms, principles) of the system

# Domains for a systems approach



# Shared Measurement

- Collecting data and measuring results consistently across all participants ensures efforts remain aligned and participants hold each other accountable.
- The process of designing and managing the shared measurement system is participatory and transparent
- Quality data on a set of meaningful indicators is available to partners in a timely manner

# Principles for Assessment

- Focus on adaptation rather than attribution and fidelity
- Focus on improving (rather than proving) effectiveness
- Create shared measurement systems
- Consider outcomes of interest to diverse stakeholders
- Emphasize participatory and co-production approaches
- Value different types of evidence (scientific, practice, contextual)
- Develop measures/methods to assess complexity, capacity, context and trust
- Create relevant and timely feedback loops

# Empirical evidence for a systems approach

**Table 1: Characteristics of complex adaptive systems abstracted**

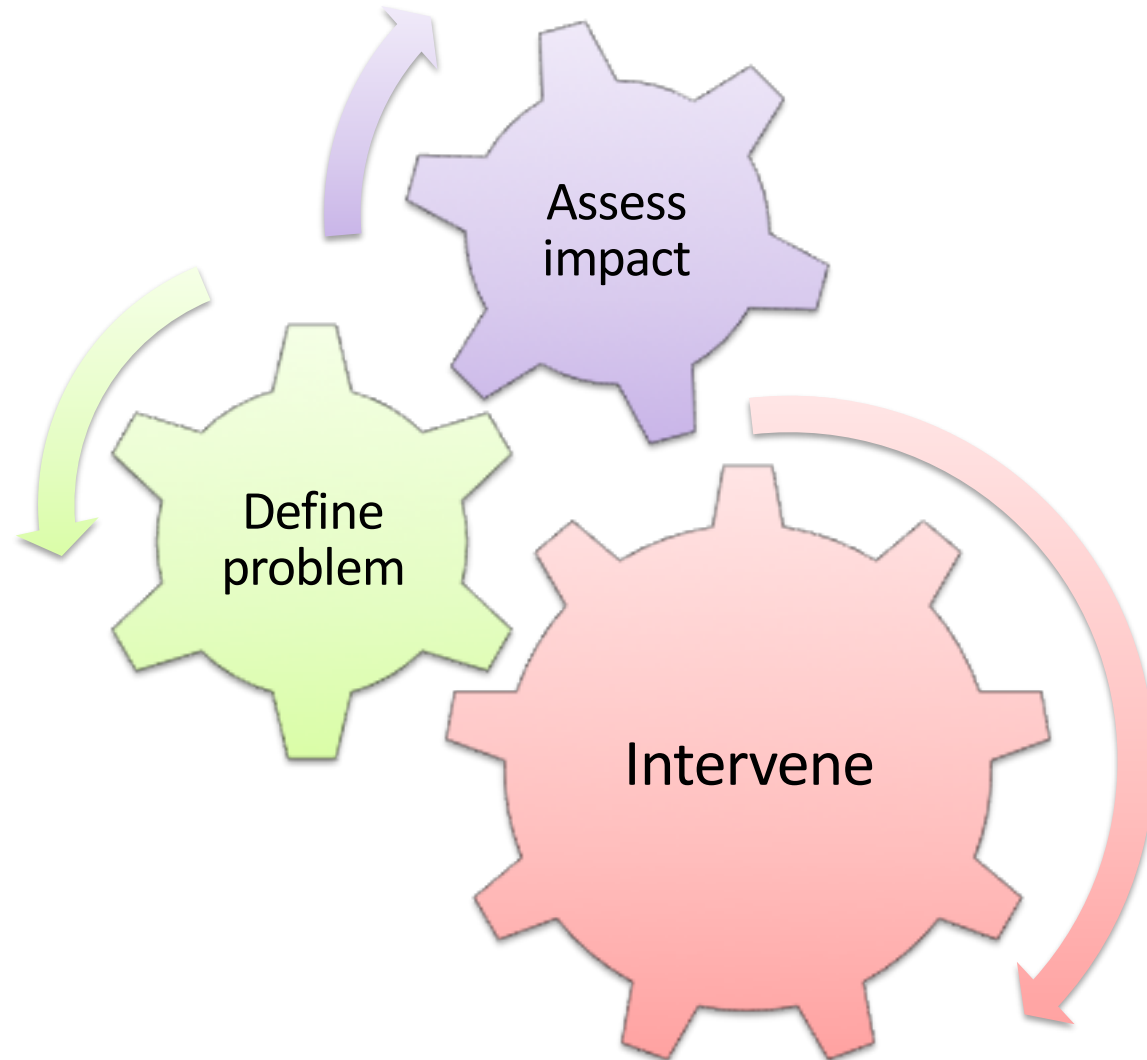
| Characteristic    | Definition  |
|-------------------|---|
| Agents who learn  | People can and will process information, as well as react to changes in information   |
| Interconnections  | Change in pattern of interactions, including non-verbal communication, among agents Introducing new agents into the system. |
| Self-organization | Order is created in a system without explicit hierarchical direction  |
| Co-evolution      | The system and the environment influence each other's development   |

**Table 4: Distribution of CAS and effectiveness of interventions**

| Total CAS Score                                  | Rating of Intervention Effectiveness |     |    | Total No. Studies with each CAS Score |
|--|--------------------------------------|-----|----|---------------------------------------|
|  | 0                                    | 0.5 | 1  |                                       |
| 0  | 1                                    | 0   | 0  | 1                                     |
| 1  | 1                                    | 1   | 0  | 2                                     |
| 2  | 1                                    | 3   | 0  | 4                                     |
| 3  | 0                                    | 7   | 11 | 18                                    |
| 4  | 0                                    | 1   | 6  | 7                                     |
| Total No. Studies at each Level of Effectiveness | 3                                    | 12  | 17 | 32                                    |

$p = 0.002$

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# Thank you



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