

# THE REALITY OF USING TRANSDISCIPLINARITY AND ECOSYSTEM APPROACHES FOR VECTOR BORNE DISEASES

Jennifer Steele, DVM, PhD

JITMM Bangkok, Thailand

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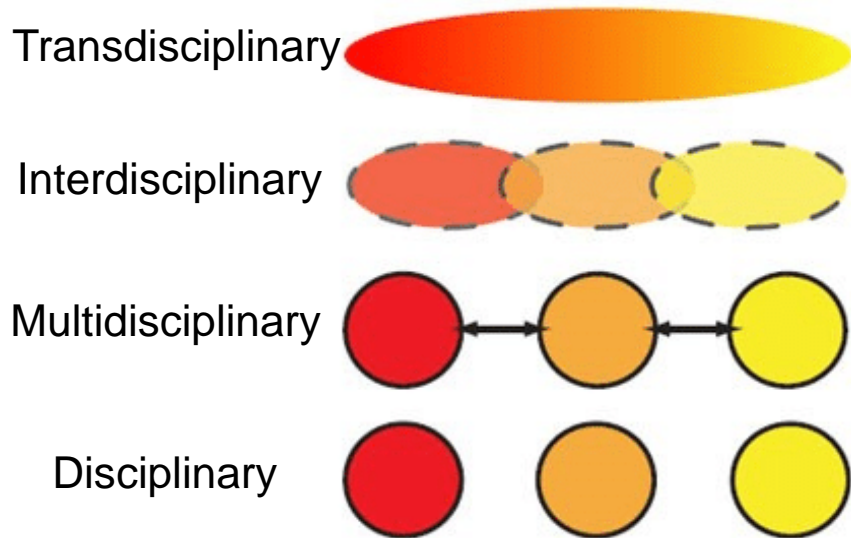
# DEFINING THE ECOSYSTEM APPROACH

A transdisciplinary approach targeted at sustainable development of human well-being in the context of dynamic interactions between society, economies, and ecosystems. (Charron 2012)

Three Pillars:

- Transdisciplinarity
- Participation
- Equity

# TRANSDISCIPLINARITY



- Crosses disciplinary boundaries
- Seeks a holistic approach
- Integration of diverse forms of research
- Issues exist between, across, and beyond disciplines
- Overarching union of knowledge
- Transcends disciplines

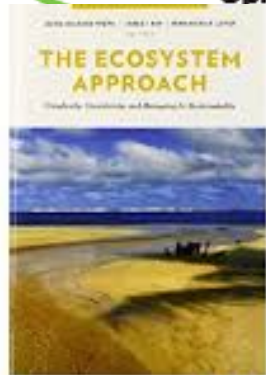
Transcend – to go beyond the range or limits of something

# WHY IS IT SO HARD?

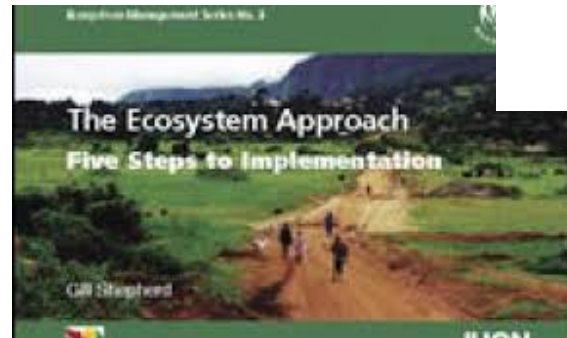


Sustaining Terrestrial Biodiversity:  
The Ecosystem Approach

Chapter 10



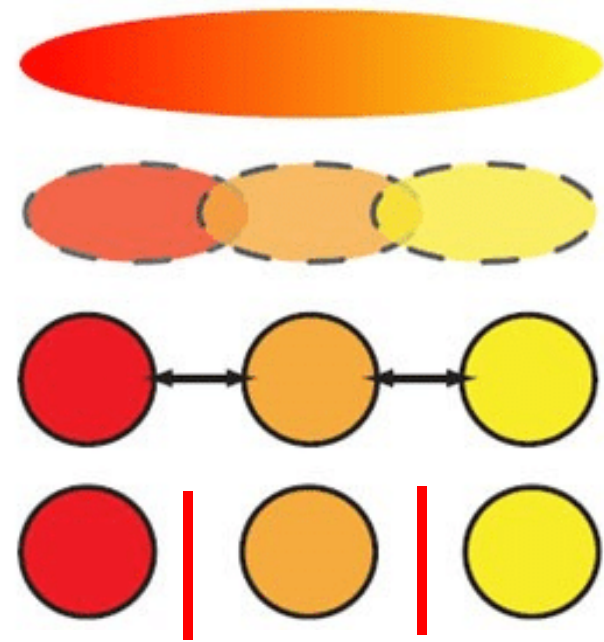
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Prime

# DISCIPLINARY CONSTRAINTS

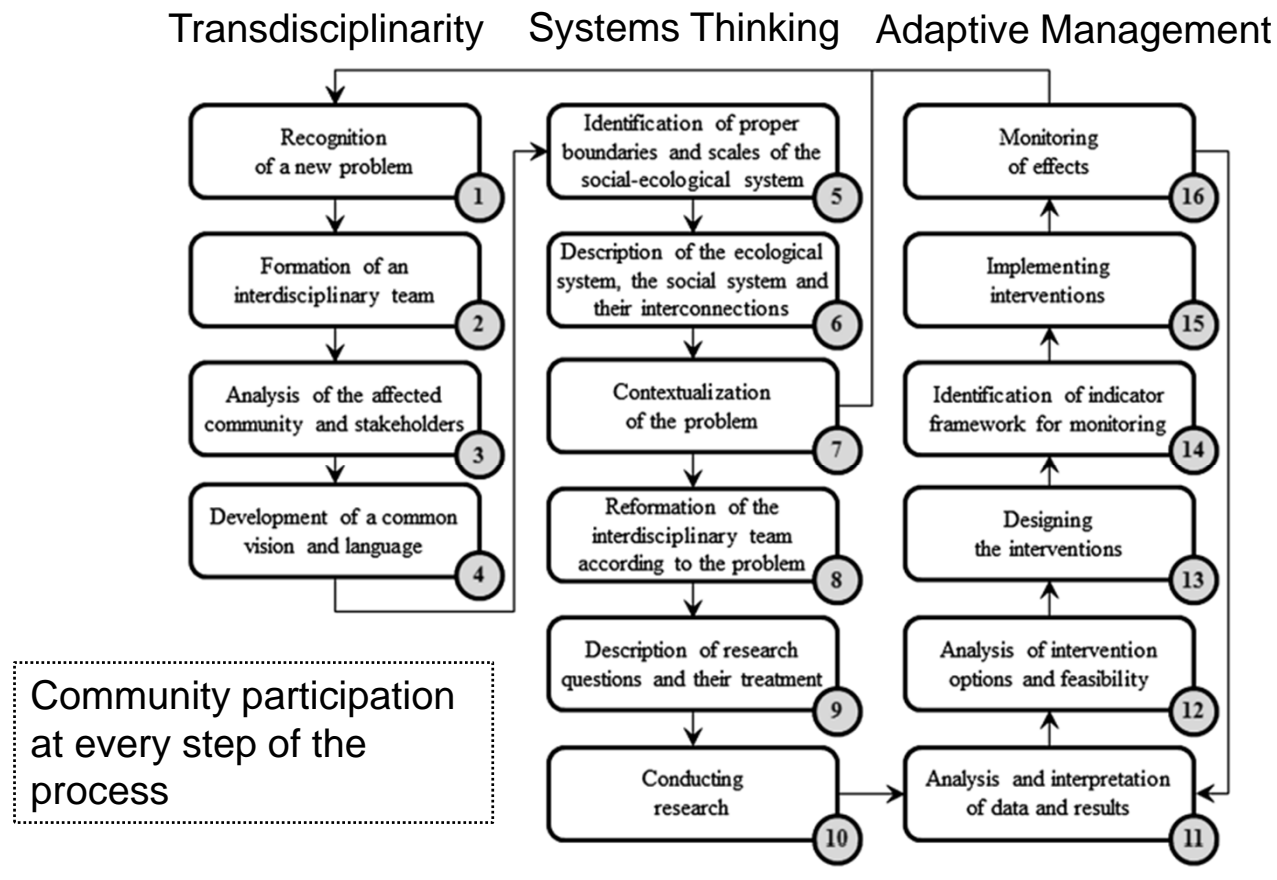
- Traditional education separates disciplinary knowledge
- Difficult to see outside of own experience
- Biomedical model has traditionally been used to approach human disease
- Complex disease problems require focus on more than the disease
- What are all the components of health?



# DEALING WITH COMPLEXITY

- Transdisciplinarity creates new concepts, methods, and innovations to go beyond discipline specific approaches
- Complex disease issues require consideration of the entire social-ecological system
- Systems thinking process can guide team through complex problem
- Development of alternate theories and ability to use adaptive management to overcome obstacles

# ECOSYSTEM APPROACH IN ACTION



Richter et al 2015, Toward Operational Criteria for Ecosystem Approaches to Health

# COMMUNITY INVOLVEMENT

- Social component of social-ecological system is key
- Local community involvement drives sustainability
- Engage community to appreciate risk, understand approach, define valued interventions, participate in management
- Use community knowledge of the ecosystem to define the problem and solutions





# WHO WORLD MALARIA REPORT 2017



- Malaria Millennium Development Goals 2015 achieved

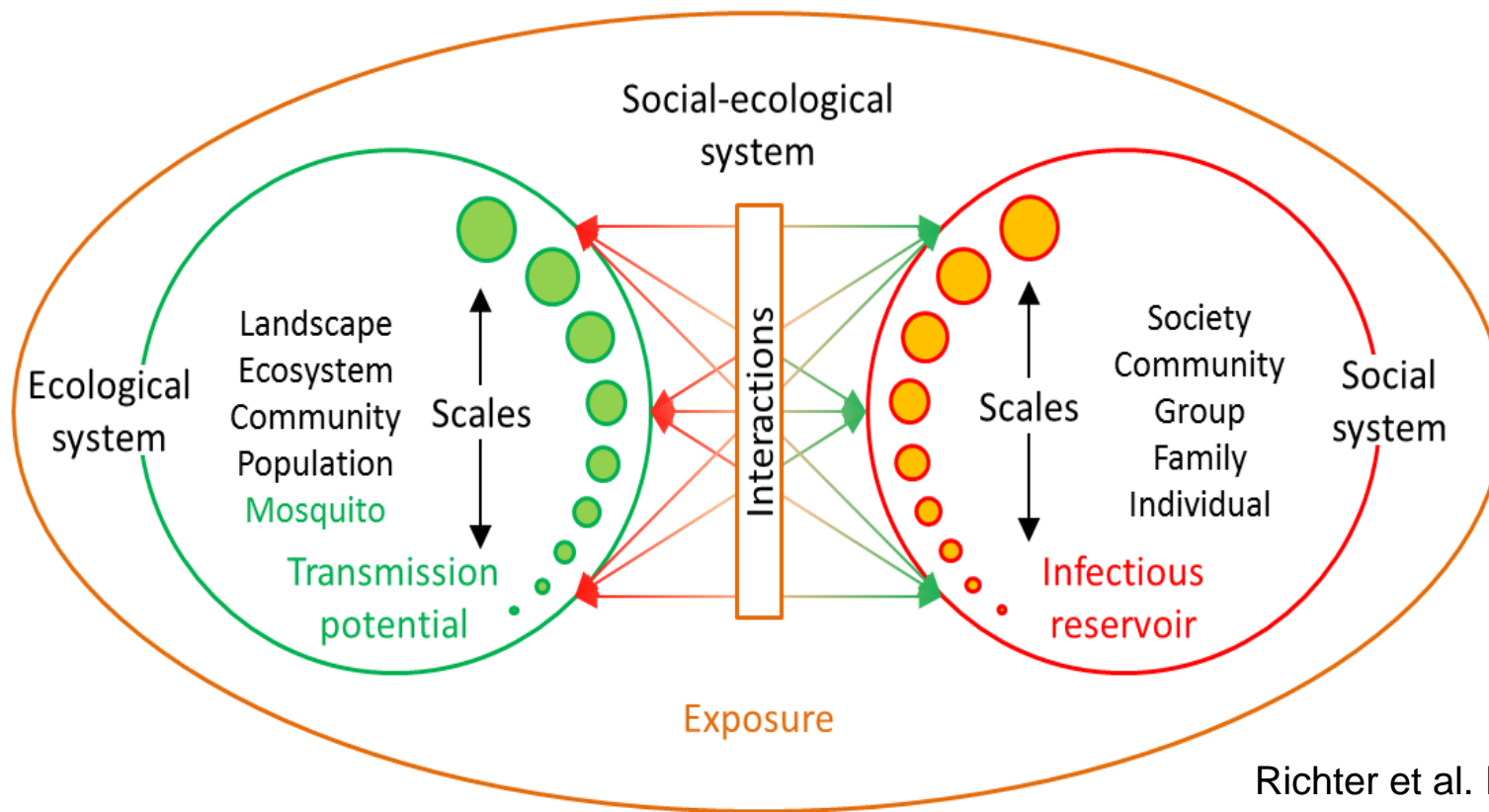
But...

- 5 million more cases globally in 2016 than in 2015
- Incidence increased in the Americas, South-East Asia, Western Pacific, and African regions from 2014-2016

# MALARIA CONTROL: SUSTAINABILITY

- Challenges to sustainability:
  - Funding – economic, political
  - Conflict zones – social, political
  - Climate – ecological
  - Access to care – social, economic
  - Surveillance systems – biomedical, social, economic
  - Diagnostics and treatment – biomedical, economic
  - Drug and insecticide resistance – biomedical, ecological

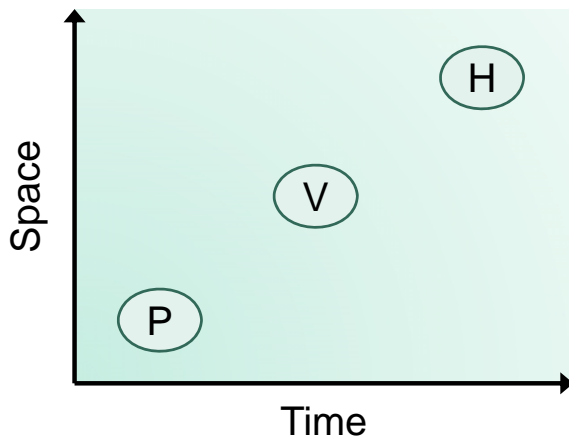
# SOCIAL ECOLOGICAL PERSPECTIVE OF MALARIA TRANSMISSION



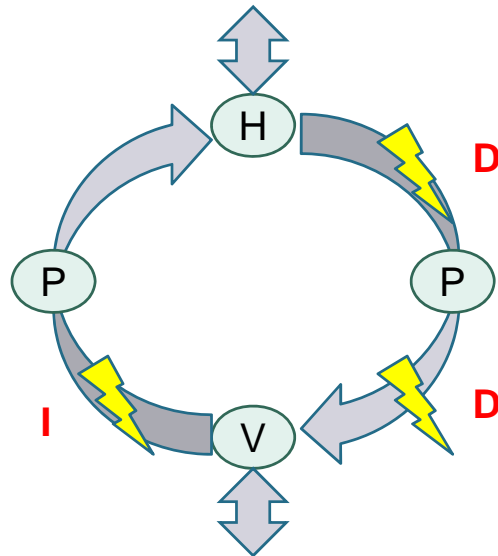
Richter et al. In preparation

# ECOSYSTEM APPROACH TO MALARIA CONTROL

## Key Variables

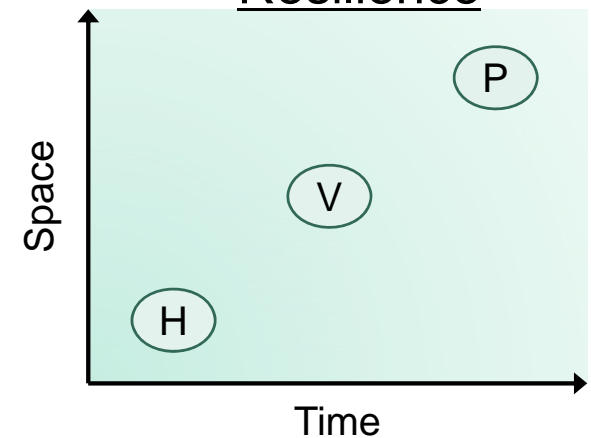


- Humans
- Vectors
- Parasites



- Drug Administration
- Insecticides

## Limitations to Resilience



- Insecticide Resistance
- Drug Resistance
- Population Mixing

Richter et al, in preparation

# ECOSYSTEM APPROACH: MALARIA CONTEXT

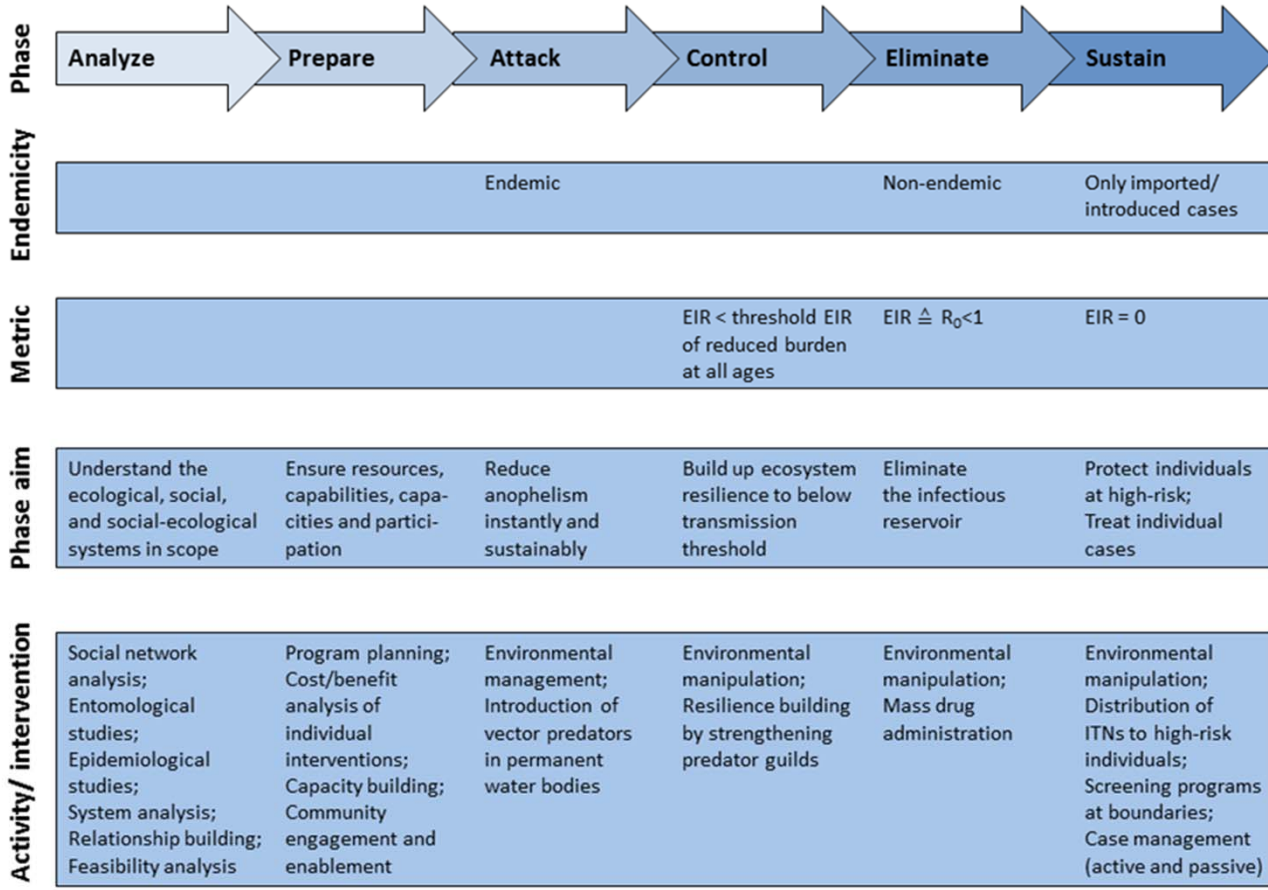
Key Variable	(V)	(H)	(P)
Sub-System	Ecological	Social-Ecological	Social
Risk Factor	vector density	exposure to biting	exposure to the infectious reservoir
Indicator	mosquitoes/ area	bites/ person	infectious bites/ bites
Domains	ecosystem management	education, development	prevention, health care access

Richter et al, in preparation

# MALARIA: HUMAN ECOSYSTEM PROBLEM

- Human social aspects influence exposure to parasite and onward transmission
  - Behaviors and attitudes toward disease and prevention
  - Access to health care
- Environmental management for vector does not eliminate all risk
- Need to incorporate public awareness and education to reduce human exposure
- Community engagement to increase adoption of preventive measures and participation in control efforts
- Key to sustainability of program achievements

# PROPOSED SCHEME FOR BUILDING SOCIAL-ECOLOGICAL RESILIENCE TO MALARIA REINTRODUCTION



Key components:

- Social
- Ecological
- Integrative preparation
- Sustainable reduction in transmission

# THANK YOU! QUESTIONS?



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