

## ECOSYSTEM APPROACHES TO HEALTH PRINCIPLES AND HISTORIES

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CONNECTS WITH:

Gender - Using and Developing an Ecohealth Case Study

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### SUGGESTED CITATION

Morrison K, Feagan M, and Brisbois B, (2012) Ecosystem approaches to health principles and histories. In: McCullagh S ed. (2012). *Ecosystem Approaches to Health Teaching Manual*. Canadian Community of Practice in Ecosystem Approaches to Health. Available: [www.copeh-canada.org](http://www.copeh-canada.org)

## MODULE INTRODUCTION

### DESCRIPTION

This module presents ecosystem approaches to health as a process of inquiry into health and ecosystems. Through activities which encourage the exploration and discussion of key principles, a critical, open-ended model of ecohealth is presented.

### DIRECTIONS

The introductory activities outlined in this module can be modified, as necessary, to meet the needs of the instructor.

- The two case study focused activities could be combined for a short ecohealth workshop, or different cases can be assigned for courses where there is more time for discussion.
- The conversation about what attracted the instructors and students to the field could be a discrete event or incorporated into other activities (e.g. in the introduction to a new talk).
- The introduction to the field ecohealth is an optional exercise that could be a didactic lecture or developed by the students independently as a self-study assignment.

**Preparation for Instructors:** Select one of the suggested case studies or develop your own case [See [Using and Developing a Case Study](#)]. Read or review a few of the seminal texts in the field, in order to develop your sense of what ecohealth is, and where it came from.

### AIMS/GOALS

- Involve students in exercises related to ecohealth.
- Have the ecohealth principles emerge from practical work.
- Be open ended and interpretive.

### GUIDING QUESTIONS

- Eco + Health + Process: Why is this integration necessary?
- Where did ecohealth come from? How is history also contextual/interpreted?
- Who, what, why, when, where, and how of ecohealth, such as:
  - How is human health linked to environmental systems?
  - Where have you encountered ecosystems and health?
  - How has the field of ecohealth developed?
  - When is an ecohealth approach needed?
  - What are the key components of an ecohealth approach?
  - What types of questions are best-suited to an ecohealth approach?

## WORKING TERMS

- Ecosystem approaches to health
- Scale
- Simple, complicated, complex problems
- Social-ecological system
- Principles of ecohealth research and practice (Charron, 2011): transdisciplinarity, systems thinking, and multi-stakeholder participation, sustainability, equity, and knowledge to action.
- Three pillars of ecohealth (Forget & Lebel, 2001): transdisciplinarity, participation, equity.

## SECTION 1- ECO + HEALTH + PROCESS

### DESCRIPTION

Through case study and group discussion, this section explores student experiences and conceptions of “health” and “environment”. Questions, discussions and activities are constructed in a way which will prompt the emergence of the 6 principles (transdisciplinarity, systems thinking, multi-stakeholder participation, sustainability, equity, and knowledge to action).

### LEARNING OBJECTIVES

- To learn about ecohealth principles, practices and questions through the examination of case studies
- To develop an understanding of the literature from which ecohealth thinking has emerged

### KEY QUESTIONS

- Why are health and ecology converging now?
- What questions are missing from the scenario/case study?
  - What perspectives are not included?
  - What scales are missing?
- How do gender [[Module 5: Gender](#)], power, equity and sustainability factor in?

### PREPARATION

#### 1. Choose a case study with ecology and health components

A good approach is to choose a case which you are already familiar, or one that you have some connection with through your community and social networks. If you would like to develop a new case, have a look at the processes outlined in [Module 8: Using and Developing a Case Study](#).

The main criteria for selecting a case is that it pertains to both environmental and health concerns. The challenge of linking environmental change to human health is the main focus of the field of ecohealth, but many papers and cases focus on one or the other.

**Examples of possible case studies to use for this section:**

- Case Study of Kathmandu, Nepal.
  - o Neudoerffer CR, Waltner-Toews D, Kay J, Joshi DD, Tamang MS. (2005). A diagrammatic approach to understanding complex eco-social interactions in Kathmandu, Nepal. *Ecology and Society* 10: 12.
- International Development Research Centre (IDRC) case studies: [http://web.idrc.ca/en/ev-27268-201-1-DO\\_TOPIC.html](http://web.idrc.ca/en/ev-27268-201-1-DO_TOPIC.html)
- Pull out a case description from a journal article (remove the scholar's interpretation).

**2. Develop perspectives**

Each case will have a variety of stakeholders associated with it – either explicitly, or implicitly. Instructors may want to develop a list of stakeholders from the text and add additional ones where necessary. Different perspectives may include those of members of the community (men, women, children, elderly; male, female; different socio-economic classes), as well as policy-makers (bureaucrats from the local, state or national government; elected or un-elected officials); and researchers with different backgrounds (engineering, environmental science, ecology, political science, anthropology, etc.).

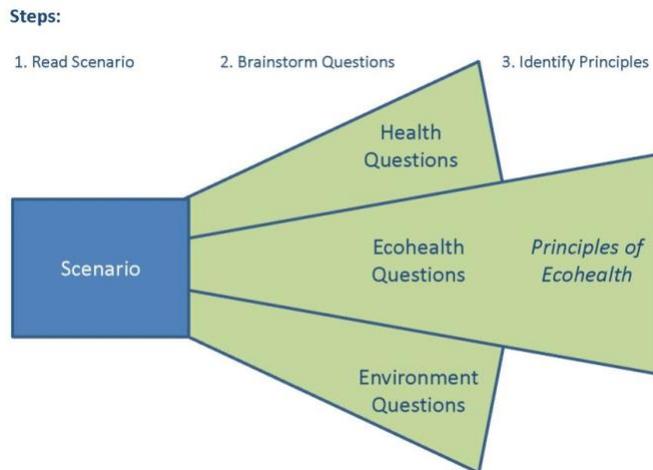
**3. Prepare prompts**

Develop a series of questions that you can use to prompt students to critically examine the case from a specific perspective. Prompts should be designed in a way that bring out issues around power, representation and participation.

In developing prompts, consider both the spatio-temporal scale and the socio-cultural context of the issues in question. Try to develop some prompts which will probe these elements of the case.

- Whose health is of interest?
- Who speaks for the trees? Fish?

## ACTIVITIES



**Figure 1.** Summary of Steps in Eco+Health+Process Activity

### **STEP 1:** Read Scenario

- Small group work (3 – 5 people)
- Distribute one copy of the case description
- Ask students to read the case and to highlight the questions that relate to environment and the questions that relate to health.

### **STEP 2:** Brainstorm Questions

- Are the health questions also environmental questions (and vice-versa)?
- Are there specific questions that combine environment and health?
- Whose health? How do you define the environment?
- From reading the case, what other questions could be considered?
- What concept of health is at work in this case?
- What concept of the environment is at work in the case?

### **STEP 3:** Identify Principles

- *Plenary Discussion:* Use the prompts you developed to facilitate a plenary discussion which connects the concepts of health and environment which students found in their examination of the cases. Draw attention to ideas which reflect the principles of ecohealth as the discussion progresses.

## SPECIFIC READING

*Select one reading which relates to the case that you have chosen to use.*

Webb, J., D. Mergler, M. W. Parkes, J. Saint-Charles, J. Spiegel, D. Waltner-Toews, et al. (2010). "Tools for Thoughtful Action: the role of ecosystem approaches to health in enhancing public health." *Canadian Journal of Public Health* 101(6): 439-441.  
[http://www.copeh-canada.org/documents/Volume\\_101-6\\_439-41.pdf](http://www.copeh-canada.org/documents/Volume_101-6_439-41.pdf)

## SECTION 2: INTERESTS AND EXPERIENCES IN ECOHEALTH

### DESCRIPTION

This session provides an opportunity for students and instructors to talk about how and why they first got involved with ecohealth.

### LEARNING OBJECTIVES

- Recognize that people have been attracted to the field from very different backgrounds and experiences.
- Share experience and develop insight into how ecohealth approaches research.

### FORMAT

- This entire session can be done as a plenary discussion, or participants can begin their discussions in smaller groups and then come together as a plenary after they have had the opportunity to share their experiences.
- Another approach could to break people into groups of 2 and ask them each to spend 5 – 10 minutes interviewing each other, then facilitate a plenary discussion.

### KEY QUESTIONS

- How did you become involved in ecohealth?
- Why are you interested in the field?

### DISCUSSION QUESTIONS

- What is ecohealth a response to?
- What conditions call for an ecohealth approach to health?
  - Emergence of complex problems and the incapacity of traditional medical model of health to deal with them
- How is ecohealth situated in relation to other approaches to health?
- What does it mean to take an ecosystem approach to health?
- What institutional and infrastructural supports seem to be necessary to facilitate this approach?
- What attitudes and dispositions are related to this approach?

## SECTION 3: ECOHEALTH HISTORIES

### DESCRIPTION

This session develops the intellectual and institutional history of ecohealth through a combination of instruction (information transfer) and interpretation (student recontextualization of information) employing collaborative, group work processes.

### LEARNING OBJECTIVES

- Identify key moments in the history of health.
- Think about the significance of key events.
- Experientially explore the idea of multiple perspectives and languages related to the same “facts”.
- Demonstrate the evolution of thinking on environment and health over time.
- Represent the idea of ecohealth as a collective and situated way of thinking and acting.

### KEY QUESTIONS

- How have people understood health, environment, and the interaction between the two over time?
- What institutional structures, events and paradigms (or paradigm shifts) are relevant to understanding the origins of ecohealth?
- What are the inter-relationships between the concepts described as ecohealth and the places and people who have been involved with them over time?
- What are the histories of ecohealth? (link to contemporary post-colonial historiography)

### PREPARATION

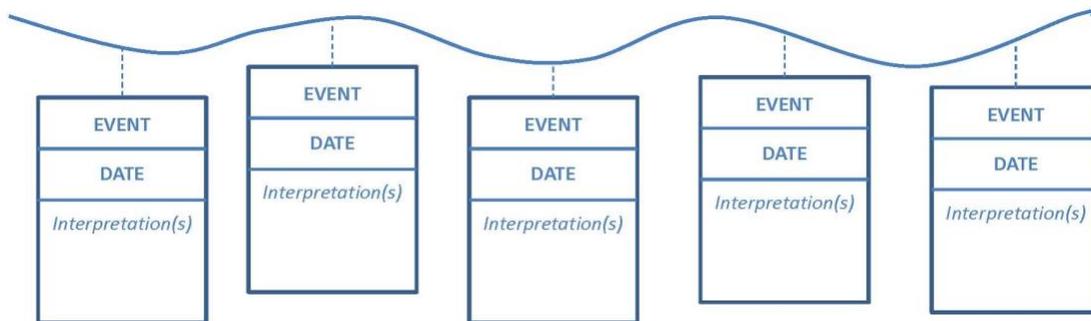
- The teaching team should develop a ‘History of Ecohealth Milestones’ document.
  - Circulate Table 1
  - Each member will contribute from their disciplinary, professional, organizational, personal, cultural perspectives.
  - Create cards for each event using the information developed in Table 1.
    - Cards can be created based on the table that contain these milestones in Ecohealth (dates, places, names, dollar figures, languages, etc.) – see Figure 2.
- Milestones will begin with Aristotle (and other early integrative thinkers) who theorized the relationship between health and larger systems. Include more recent theories, including Schwab’s One Medicine, conservation biology, ecosystem health and others.
  - Include descriptions of milestone significance (interpretations). This may be done by the instructors or researched by students.

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- Students will be asked to connect the events into a narrative that demonstrates how thinking in the field has evolved over time, so **consider this when selecting and describing the milestones.**

Date	Event/Title	Organizers and Participants	Place	Significance to Ecohealth	Alternative Significance
300 BC	Early Philosophy	Aristotle and students	Ancient Greece	Early expression of integration of environment and health	
1986	Ottawa Charter for Health Promotion	Canadian Department of Health	Ottawa	Mention of environment (but underdeveloped ...)	
2003	Health: An ecosystem approach	IDRC	Ottawa	First attempt to define ecohealth pillars	
2004	Ecohealth Forum	IDRC international	Montreal/ Merida, et.	Field Building	

**Table 1.** Example content for History of Ecohealth Milestones



**Figure 2.** Ecohealth milestone cards arranged on a timeline.

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## ACTIVITIES

**Many activities can use the cards and timeline as a basis for discussion, for example:**

1. 'Creation myth':
  - Participants are provided with milestone cards containing dates, names, locations, etc., but with the 'Significance to Ecohealth history' (Interpretations) section left blank.
  - Working in groups of three or four, participants are asked to select milestones they feel are important to telling the history of Ecohealth, then fill in the 'Interpretation' section of those cards.
  - One group member should be selected to tell the story of Ecohealth to the group as a whole.
  - After each group has told their story to the group, there should be time for debrief/discussion. At this point, the facilitator can fill in any gaps they think participants missed and guide a discussion about how the way in which we order facts can affect interpretation. How would a different order lead different interpretations?

Additional options:

- a. Divide the groups based on age, gender, disciplinary background, or other;
  - b. As students will be expected to have read at least one of the 'story of Ecohealth' assigned readings, they can also be separated based on which reading participants did. There should be a respectful but potentially provocative discussion about the different stories that emerged.
2. Facilitator tells 'the' story of Ecohealth using milestone cards – points to key events being more relevant to certain disciplines than others.
  3. Students are given individual cards and asked to research the event and think of how it might be significant to ecohealth – they then present their card to the group and place it on the shared timeline (see Figure 2). The cards will be more and less relevant to the history of ecohealth from different disciplinary, geographical and cultural perspectives. The cards used and developed in Latin America or China will be different than those developed in a North American context. Blank cards will also be provided so that students can include events they deem to be significant, and that better reflect their context.

#### SPECIFIC READING

Students should be asked to read at least one of the following (preferably the one they think looks most interesting at first glance):

- Cole D. (2006). Canada's International Development Research Center's Eco-Health projects with Latin Americans: origins, development and challenges. *Canadian Journal of Public Health Revue Canadienne de Sante Publique* 97:8-14.
- Wilcox BA, Aguirre AA, Daszak P, Horwitz P, Martens P, Parkes M, et al. (2004). EcoHealth: A Transdisciplinary Imperative for a Sustainable Future. *EcoHealth* 1:3-5.
- Waltner-Toews D, and Kay J. (2005) The Evolution of an Ecosystem Approach: the Diamond Schematic and an Adaptive Methodology for Ecosystem Sustainability and Health. *Ecology and Society* 10: 38 Available at: <http://www.ecologyandsociety.org/vol10/iss1/art38/>
- Bunch M, McCarthy D, Waltner-Toews D. (2008). Chapter 8: A Family of Origin for an ecosystem approaches to managing for sustainability. In D Waltner-Toews, J Kay NM Lister. (Eds.), *The Ecosystem Approach: Complexity, uncertainty, and managing for sustainability*. New York: Columbia University Press.
- Forget G, & Lebel J. (2001). An ecosystem approach to human health. *International Journal of Occupational & Environmental Health* 7: S3-38.
- Charron D. (2011) *Ecohealth Research in Practice: Innovative Applications of an Ecosystem Approach to Health*, New York, NY: Springer / Ottawa, ON: International Development Research Centre.
- Dakubo CY. (2011). Chapter 1, Section 1.1: Introduction. *Ecosystems and Human Health: A Critical Approach to Ecohealth Research and Practice*. New York, NY: Springer, pp. 3-17.
- Parkes M, Panelli R, & Weinstein P. (2003). Converging paradigms for environmental health theory and practice. *Environmental Health Perspectives*, 111: 669-675.

## SECTION 4: CASE STUDY

### DESCRIPTION

Using the same case study used in Section 1, students are challenged to identify the kind of questions that require an ecohealth approach. Complex questions are differentiated from complicated and simple questions and the strengths and weaknesses of each are discussed.

### LEARNING OBJECTIVES

- Identify and discuss the differences between simple, complicated and complex questions.
- Develop the ability to zoom in and out to place different studies in their larger context.
- Consider how framing the research question differently can lead to different kinds of studies.

### KEY QUESTIONS

- What research questions emerge from the case study?
- Which questions require an ecohealth approach? Another approach?
- Who decides which questions are asked, funded, identified?
- How might the different questions fit together? Or not?

### KEY CONTENT

Using the case study, pull out a variety of questions and perspectives. Demonstrate how, from the same case, simple, complicated and complex questions can emerge (see Figure 3). Complex questions and “wicked problems” (Rittel & Webber, 1973) are characteristic of ecohealth investigations, as they tend to require the weighing of different values and perspectives, at different spatio-temporal scales.



**Figure 3.** Scenario analysis to identify questions requiring an ecohealth approach

The terms simple, complicated and complex are often used to describe ecohealth thinking (and similar systems-based thinking in other fields, see for example Westley et al., 2006). Generally speaking: Simple systems are easily knowable – they respond well to relatively straightforward (often single discipline) investigation or action. Flying an airplane is an example of a simple system. Complicated systems are difficult to master but benefit from the combined expertise of a number of experts – e.g. multi-disciplinary and interdisciplinary research. Building an airplane is an example of a complicated system requiring the expertise of many actors.

Complex systems are inherently unknowable and unpredictable. Raising a child is an example of a complex system. Investigations tend to focus on trends, patterns, processes and relationships (Capra, 2005) in particular spatial-temporal contexts. Complex systems are characterized by non-linearities, autocatalysis, time delayed feedback loops, emergent phenomena, and chaotic behaviour (Kay and Regier, 2000; Costanza and Jorgenson, 2002; Gunderson and Holling, 2002). Incorporating multiple ways of knowing is an important theme (e.g. transdisciplinary research, Brown et al., 2010).

Another commonly used breakdown emphasizes linear, random and middle-number systems, whereby:

- Linear systems can be represented by mathematical equations (linear or quadratic) such as:

$$x + 2 = y \text{ or } x^2 + 2y + c = 0$$

- Random systems can be represented by various statistical methods, including mean, median, standard deviations, p-values, etc.
- Middle-number systems are neither linear nor random and are impossible to model mathematically. Middle number systems are defined by the observer. They characterize many social-ecological systems (Kay and Schneider, 1995).

#### EXAMPLES

From x case, the following questions could emerge:

- Simple: What is the effect of x parasite on dogs?
- Complicated: How are dogs infected with x?
- Complex: How can we reduce the impact of x on dog populations?

#### ACTIVITIES:

#### MODULE 2: ECOSYSTEM APPROACHES TO HEALTH PRINCIPLES AND HISTORIES

- **Individually or in groups:** Read the case and develop research questions that emerge from it. Identify what kind of question each is; simple, complicated or complex. Discuss the differences between the kinds of questions and any gaps or differences in perspectives which they give rise to.
- **Plenary:** How are the questions related to different aspects of the social-ecological system?

#### SPECIFIC READING

- Brown V, Harris JA and Russell JY. (2010) *Tackling Wicked Problems: Through the Transdisciplinary Imagination*. London: Earthscan.
- Capra F. (2005) Complexity and life. *Theory, Culture & Society* 22: 33-44.
- Costanza R and Jorgenson SE. (2002) Introduction: Understanding and Solving Environmental Problems in the 21<sup>st</sup> Century: Toward a new, integrated hard problem science. In: Costanza R. and Jorgenson SE. (eds.). *Understanding and Solving Environmental Problems in the 21<sup>st</sup> Century: Toward a new, integrated "hard problem science*. New York: Elsevier Science Ltd.
- Kay J and Regier H. (2000) Uncertainty, Complexity, and Ecological Integrity: Insights from an Ecosystem Approach. In: PA Crabbe, L Holland, Ryszkowski and L Westra (eds.) *Implementing Ecological Integrity: Restoring Regional and Global Environmental and Human Health*. Kluwer, NATO Science Series, Environmental Security.
- Kay J and Schneider E. (1995) Embracing complexity: the challenge of the ecosystem approach. *Perspectives on Ecological Integrity* 5: 49-59. DOI: 10.1007/978-94-011-0451-7\_4
- Gunderson LH. and Holling CS. (2002) *Panarchy: Understanding Transformations in Human and Natural Systems*. Washington: Island Press.
- Rittel HWJ and Webber MM. (1973). Dilemmas in a General Theory of Planning. *Policy Sciences* 4, 155-169.
- Westley F, Zimmerman B and Patton M. (2006). *Getting to Maybe How the World Is Changed*. Toronto, Canada: Random House Canada. See Simple, Complicated and Complex Problems. pp. 8-10

## REFERENCES

Students pick 1-2 to read:

- Forget G, & Lebel J. (2001). An ecosystem approach to human health. *International Journal of Occupational & Environmental Health* 7: S3-38.
- Charron D. (2011). *Ecohealth Research in Practice: Innovative Applications of an Ecosystem Approach to Health*, New York, NY: Springer / Ottawa, ON: International Development Research Centre.
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- Waltner-Toews D, & Kay J. (2002). An Ecosystem Approach to Health. *Leisa Magazine* March: 15-16.
- Wilcox B, Aguirre AA, Daszak P, Horwitz P, Martens P, Parkes, M, Patz JA, & Waltner-Toews D. (2004). EcoHealth: A transdisciplinary imperative for a sustainable future. *EcoHealth* 1: 3-5.
- Cole DC, Crissman C, Orozco AF. (2006). Canada's International Development Research Centre's Eco-Health Projects with Latin Americans: Origins, Development and Challenges. *Canadian Journal of Public Health* 97: 8-14.