

A Gift of Transdisciplinarity

The Eco-health Approach

In 1950, the world's population was around 2.5 billion. In the following hundred years, the world's population is predicted to grow by more than 6.5 billion to over 9 billion. Amidst this human population boom, the earth's ecosystems are straining to provide the resources that are needed. As the human population expands and spreads, so do increasingly escalating environmental and health problems, making human health more directly dependent on environmental health than ever before. Today, the world faces a difficult challenge in promoting and improving human health through economic and social development, while still protecting ecosystems and promoting environmental sustainability.

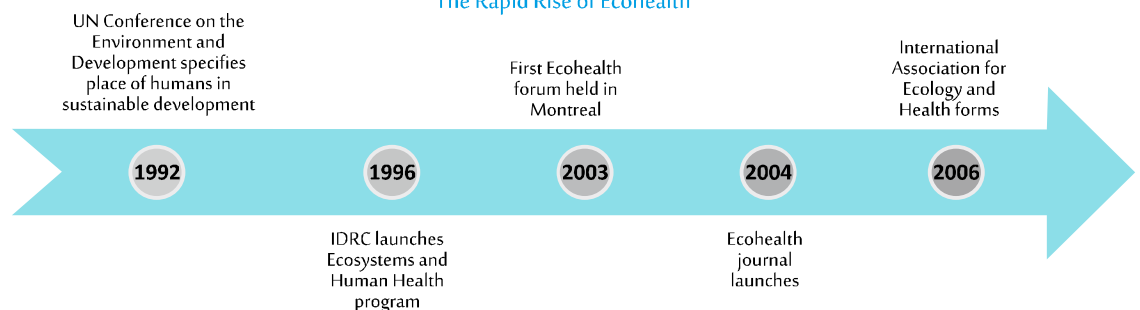
In the early 1990s, a new approach to addressing the intersection of human health with environmental sustainability began to emerge. Christened Ecosystems Approach to Health or Ecohealth, it recognized that health is at the intersection of the environment, economy, and community, and looks at how the three systems interact with each other. As the world continues to expand, Ecohealth is a key approach to find the balance between human expansion, human health, and the health of our environment.

Evolution of ecohealth

The concept that human health is inextricably linked with the health of other organisms and the ecosystems in which we live has been around for thousands of years. In the 1900s, veterinary epidemiologist Calvin Schwabe wrote extensively on the one medicine approach of ancient Egyptian and Dinka priests, and greatly supported the adaptation of a comparative medical approach to modern Western medicine. The integrative approach supported by the Ancient Egyptians thousands of years ago can also be traced to ancient Chinese, Arab, and Indian cultures. Later, Hippocrates would urge doctors to take a comprehensive approach to patient care, and in the 1800s, Rudolf Virchow argued that the causes of human disease were social and political. However, by the early to mid-20th century, with the advent of germ theory and other scientific breakthroughs, the ideas of integrated approaches to health were lost among ideas of fierce scientific and technological understandings of the world's health issues.

In the 1970s and 1980s, the expansion of the field of ecology saw the rise of environmental health and sustainable development. In 1992, the United Nations Conference on the Environment and Development brought the fields of human health and ecology together, declaring that "human beings are at the center of concerns for sustainable development". Since the 1990s, the field of Ecohealth has been growing in prominence, with the creation of a large international research program at the International Development Research Centre (IDRC) based in Canada, as well as the recent creation of major regular international conference, a scholarly journal, and an international association.

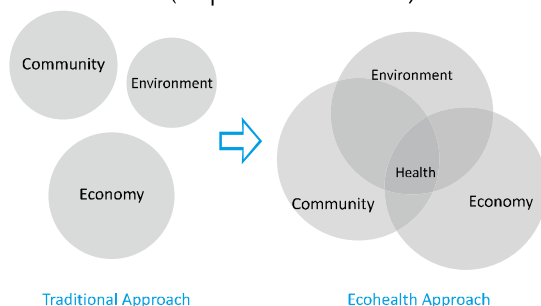
The Rapid Rise of Ecohealth



What makes the ecohealth approach powerful ?

Ecohealth is not a formula or a recipe; rather, it is an approach that highlights looking at human health with a broader lens. Traditional approaches to improving human health usually involve single disciplines, compartmentalizing and studying each separately. For example, epidemiological studies may study the prevalence of one specific disease in the region without really addressing why or how the prevalence is increasing or decreasing. Economic analysis can demonstrate the cost effectiveness of a disease prevention program, and environmental studies can show the benefits of different irrigation practices; what Ecohealth would do is to tie these pieces together to give a composite picture of the situation. Better still, well-done Ecohealth can

Traditional approaches to health vs. the Ecohealth approach (adapted from Lebel 2003)



transcend disciplinary boundaries to create new ways of approaching the health of communities through new forms of composite research design.

Each Ecohealth activity or project inherently involves three groups of participants: researchers and other specialists; community members, including ordinary citizens, peasants, miners, and city-dwellers; and decision-makers. The decision-makers could be representatives of government or other key stakeholder groups, but also those with informal influence based on their knowledge, experience, and reputation. Ecohealth studies bring the multiple specialist disciplines together with members of the affected community before the study begins.

Six principles lie at the heart of the Ecohealth approach: systems thinking, transdisciplinary research, participation, sustainability, gender and social equity, and knowledge to action. Ecohealth research connects ideas of social and environmental determinants of health with those of ecology and systems thinking to form an action-research framework, usually applied in a context of social and economic development.

Six Principles of Ecohealth

Systems Thinking	<ul style="list-style-type: none"> ● Considers relationship among several dimensions (ecological, social-cultural, economic governance) ● Can lead to better understanding of limits of a problem, its scale, and its dynamics
Transdisciplinary Research	<ul style="list-style-type: none"> ● Involves integration of research methodologies and tools across disciplines ● Includes non-academic perspectives and knowledge ● Engages community members and decision makers
Participation	<ul style="list-style-type: none"> ● Stakeholder participation adds to knowledge generated by research and enhances action that result from research ● Help identify barriers to change, clarify information and knowledge gaps
Sustainability	<ul style="list-style-type: none"> ● Ecohealth research aims to make ethical, positive and lasting changes. ● Changes must be environmentally and socially sustainable (socially and culturally responsible, easily systematized)
Gender and Social Equity	<ul style="list-style-type: none"> ● Differences between members of different social, economic, class, age, or gender groups in all societies are reflected in relationships with ecosystems, exposure to health risks, and health status ● Need for more gender and social analysis in Ecohealth research
Knowledge to Action	<ul style="list-style-type: none"> ● Notion that knowledge from research is used to improve health and well-being through an improved environment ● Innovations, actions, and changes that result from Ecohealth research involve multiple sectors, agencies, and stakeholders

How can we use the transdisciplinarity of ecohealth?

As time goes on, our interactions with the environment and the ecosystems of other organisms are becoming more and more complex. It is clear that many of the problems that we face today do not have straightforward cause and effect linkages or solutions. Ecohealth is different from other approaches to human health because of its reliance on multiple knowledge systems to develop the questions that it must address, the methods that it will use and the analytical frameworks that it will draw upon to reach its conclusions. Ecohealth does not shy away from tackling even the most vexed questions, because it is empowered with the many different ways of thinking about these questions. Because of its transdisciplinary approach, Ecohealth can be a valuable tool for studying the numerous threats to human and environmental health including understanding the connections between natural resources, pollution, ecosystems, politics and health; studying poverty and vector-borne diseases; linking human health to changing rural agricultural ecosystems; discovering ways to combat the effects of urbanization; and tracking and controlling disease outbreaks.

Ecohealth approaches are not limited to complex, long-term projects; they can also be highly useful in fast-paced epidemic situations. This can be seen in the dengue epidemic of 2001 in Cuba, when authorities relied on the Ecohealth approach to communicate among academics and communities to track, identify, and control dengue-related risk factors. Though the entomology of the *Aedes aegypti* mosquito responsible for spreading the dengue had been understood, the Ecohealth approach allowed researchers, communities, and local government to comprehensively characterize the underlying driving forces and pressures that led the mosquitoes to vulnerable human populations and thus plan accordingly to implement sustainable interventions for disease control and prevention.

Even in situations where the straightforward scientific evidence for health issues has not yet been found, Ecohealth research is extremely valuable in controlling the spread of disease. For example, in the

Lushoto region of Tanzania, scientists have been struggling for almost 20 years against plague in the communities. Though they have yet to resolve the problem, Ecohealth research approaches have shed new light on certain behavior problems that could contribute to the issue. For instance, the residents of Lushoto store their grains under the roofs of their homes where the flea where likely to rest, unlike other communities in eastern Africa. In addition, epidemiologists in the area found that

women and children were most susceptible to contracting the plague, and then anthropologists and social scientists discovered the reason: women and children were more likely to fetch the corn for cooking. Thus, while scientists continue to work on the exact cause of plague in Lushoto, progress has still been made on the control and prevention of the disease.

What is the future of transdisciplinarity?

Looking forward, the greatest value of Ecohealth lies in the potential of its six principles – systems thinking, transdisciplinarity, participation, sustainability, gender and social equity, and knowledge to action – to come together and forge new and innovative solutions for constantly evolving social and environmental problems. This cross-learning and information sharing not only expands the knowledge of all parties involved in the projects, but also helps them apply information they may never have even considered to be relevant to their research. For example, tourist destinations represent areas in which unplanned development can escalate the emergence of vector-borne and zoonotic diseases. Control and prevention of these diseases requires not only a thorough understanding of ecological, biological, and sociological (eco-bio-social) determinants but also the ability to conduct research that probes what fuels disease emergence.

The vast potential of transdisciplinarity to lead to new discoveries and innovations has been seen not only in health, but also across sectors such as management and technology. For example, in cities in the United States software engineers have been able to collaborate with law enforcement officials and municipal government actors to develop mobile

