



One Health and Ecohealth in Southeast Asia: Highlights of research by the International Livestock Research Institute and its partners

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The world is facing numerous health issues including the emergence and re-emergence of infectious diseases. The Southeast Asia region is a hot spot for emerging infectious diseases that present serious socio-economic, environmental and development challenges. Non-infectious diseases associated with the intensification of crop and livestock agriculture also lead to impacts on human and animal health and the environment.

Due to the complex interaction of disease emergence and environmental factors, the region needs strong capacity to respond to current and future challenges of emerging infectious diseases. One Health and Ecohealth approaches are more effective ways to tackle the complexity associated with emerging infectious diseases than employing a single disciplinary approach. Since 2008, the International Livestock Research Institute (ILRI) and partners have worked on One Health and Ecohealth in Southeast Asia in the areas of research, capacity development and influencing policy on the management of food safety and zoonoses.

Research

The main Ecohealth research activity was a project on 'eco-system approaches to the better management of zoonotic emerging infectious diseases in Southeast Asia' (see Box 1).

The project was unique in that it did not come packaged with a set of research questions for the teams to explore. Selecting research questions, collecting data, conducting analysis and writing and presenting results were led by local teams. In this way, Ecohealth research capacity was built through a learning-by-doing approach.

As the project came to a close, research teams planned strategic knowledge translation activities, including policy briefs and workshops, to communicate research findings to stakeholders. Through training in this area, many researchers improved their ability to reach key decision-makers. Research topics covered included various zoonoses that are relevant to the region such as leptospirosis (Indonesia and Vietnam), brucellosis (China), salmonellosis (Thailand), rabies (Indonesia) and diarrhoea (Laos).

Food safety research involving academia, policymakers and the local community was undertaken to address the safety of the pork value chain in Vietnam. A task force of risk assessment for food safety has been developed in Vietnam, bringing together representatives from the Ministry of Health and the Ministry of Agriculture and Rural Development as well as scientists from universities and research institutes working on risk assessment and food safety.

The task force is developing guidelines for risk assessment in food safety management in informal markets catering to local consumers. These guidelines will help train a wide range of decision-makers, including high-level policymakers.

A technical course and case studies on food safety in informal markets are helping to develop capacities in risk assessment among implementers, followed up by mentoring and on-the-job support. Case studies on food safety include the health risks associated with consuming contaminated vegetables and fish grown in wastewater and antibiotic residues in pork.

Group discussion at the first meeting of the task force for risk assessment in food safety, Hanoi, September 2013 (Credit CENPHER/ Giang Pham)



Capacity development

The project teams facilitated the establishment of links within and between academic institutions from the two Ecohealth resource centres established at Chiang Mai University in Thailand and Gadjah Mada University in Indonesia. Student exchanges between the two universities fostered sharing of knowledge, trans-disciplinary collaboration and networking between students and faculty leaders.

Within each university, faculty Ecohealth champions have given lectures in universities in the region, including in Indonesia, Laos, Thailand and Vietnam. The International Livestock Research Institute (ILRI) has contributed to the emergence and development of the Center for Public Health and Ecosystem Research (CENPHER) at the Hanoi School of Public Health in Vietnam.

With the support of their academic institutions, the Ecohealth resource centres play an important role in developing national and regional Ecohealth research

capacity and networks for current and future professionals to apply Ecohealth principles in preventing, managing and controlling zoonotic diseases.

Influencing outcomes and policy

As part of a synthesis exercise, the teams reviewed all Ecohealth programs, initiatives and projects implemented in Southeast Asia over the last 10 years, gathering information from peer-reviewed literature to examine the lessons, challenges and ways forward. Activities include projects focused solely on capacity, those focused on solely on research and those covering both capacity and research.

The review pointed to achievements such as research on infectious diseases in relation to socio-ecological factors associated with urbanization and agricultural intensification.

It also pointed to challenges in project design and implementation, limited capacities and coordination mechanisms to develop Ecohealth research teams in countries, limited assimilation by teams of underlying Ecohealth tenets and their translation into sustainable disease prevention and control, and the inability to scale up Ecohealth projects.

The ILRI teams suggested ways forward for Ecohealth from a regional perspective in terms of research, training and policy translation using Ecohealth in combination with the One Health approach.

Outcome mapping

All these One Health and Ecohealth projects used outcome mapping to assess and document changes in the knowledge, attitudes and practices of Ecohealth among partners. Facilitators from ILRI led sessions with the teams where they reflected on the process of team development and organizational learning. Teams then ranked their progress – low, medium or high – on each of the progress markers. Most teams held two outcome mapping sessions, so changes in knowledge, attitudes and practices could be compared.

Stall owners watch over their pork and beef stock in a wet market, Hanoi, Vietnam (Credit ILRI/ Andrew Nguyen)



Table 1: Preliminary estimate of costs and benefits of One Health investments over a 10-year period with benefits and costs per year.

One Health investment area	Annual benefit (US\$)	Annual cost (US\$)	Confidence
Sharing resources	4 billion	1 billion	++
Controlling zoonoses	85 billion	21 billion	+++
Ensuring timely response	6 billion	3.4 billion	++
Averting pandemics	30 billion		+
Improving research and development	-	-	+++
Bottom line	125 billion	25 billion	++

Note: This table summarises the estimates mentioned below.

The business case for One Health

One of the outputs was a business case for One Health that identified five potential areas where it can add value and reduce costs. These are:

- sharing health resources between the medical and veterinary sectors;
- controlling zoonoses in animal reservoirs;
- early detection and response to emerging diseases;
- prevention of pandemics; and
- generating insights and adding value to health research and development.

The table above gives examples for each category, along with preliminary estimates of the potential savings from adopting the One Health approach. The literature reviewed suggests that one dollar invested in One Health can generate five dollars worth of benefits. A global investment of 25 billion United States dollars (USD) over 10 years could generate benefits worth at least USD 125 billion.

The challenge now is to translate these estimates into investments to save the lives of millions of people and hundreds of millions of animals.

Further reading

- Engaging stakeholders to manage emerging zoonotic diseases in Southeast Asia (cgspace.cgiar.org/handle/10568/35228)
- Increasing awareness of zoonotic diseases among health workers and rural communities in Southeast Asia (cgspace.cgiar.org/handle/10568/35229)
- Outcomes in building capacity and strengthening networks: Ecohealth in Southeast Asia (cgspace.cgiar.org/handle/10568/35230)
- Grace D. 2014. The business case for One Health. *Onderstepoort Journal of Veterinary Research* 81(2), Art. #725. dx.doi.org/10.4102/ojvr.v81i2.725
- Hung Nguyen-Viet et al. Ecohealth research in South East Asia: past, present, and the ways forward. *Infectious Diseases of Poverty* (in review).

Hmong butchers selling pig meat from the indigenous Hmong black pig (Credit ILRI/Jo Cadilhon)



Box 1: Definitions

Ecohealth is an approach that recognizes the links between people and their biophysical, social and economic environments. Ecohealth brings together physicians, veterinarians, ecologists, economists, social scientists, planners and other professionals to understand how ecosystem changes negatively impact human health and to provide practical solutions to reduce the negative health impacts of ecosystem change.

One Health is a broad movement that recognises the interdependence of human, animal and ecosystem health and that multidisciplinary collaborations are often necessary to attain optimum health solutions.

Outcome mapping is a participatory and actor-centred monitoring and evaluation framework that captures changes in knowledge, attitudes and behaviour among populations to assist research teams in learning from outreach experiences.

Zoonotic diseases or zoonoses are diseases transmitted between animals and people. The biological cycle may include one or more species as well as humans. People may be an accident in the cycle. Seventy percent of all new, emerging or re-emerging diseases affecting humans originated in animals.

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Page 1 left: Morning glory sampling in Nhue River, Hanam Province (Credit ILRI/ Hung Nguyen)

Page 1 right: Selling poultry in market in Tien Lu, Hung Yen province, Vietnam (Credit CENPHER/Pham Duc Phuc)

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