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# USAID REDUCING DEMAND FOR WILDLIFE

## ONE HEALTH LANDSCAPE ASSESSMENT

OCTOBER 2022

This document was produced for review by the United States Agency for International Development (USAID). It was prepared by RTI International for the USAID Reducing Demand for Wildlife Activity, AID-468-I-16-0001, TO 72048621F00002. The contents of this study/report are the sole responsibility of RTI International and do not necessarily reflect the views of USAID or the United States government.



# USAID REDUCING DEMAND FOR WILDLIFE

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## One Health Landscape Assessment

October 12, 2022

Contract Number:	AID-468-I-16-00001, TO 72048621F00002
Activity Start and End Date:	August 25, 2021 – February 24, 2023
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Submission date:	October 12, 2022

Cover photo: A *Rhinolophus* bat exits a cave at dusk in Perak, Malaysia

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## LIST OF ABBREVIATIONS

AMAF	ASEAN Ministers on Agriculture and Forestry
ASEAN	Association of Southeast Asian Nations
ASOF	ASEAN Senior Officials on Forestry
CBNRM	Community-Based Natural Resource Management
CDC	Centers for Disease Control
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COVID-19	Coronavirus Disease 2019
CWT	Combating Wildlife Trafficking
DEEP-VZN	Discovery and Exploration of Emerging Pathogens – Viral Zoonoses
DHM	Disaster Health Management
ESG	Environmental and Social Governance
EU	European Union
FAO	Food and Agriculture Organization
IFAW	International Fund for Animal Welfare
INGO	International Non-governmental Organization
INTERPOL	International Criminal Police Organization
IP	Indigenous Peoples
IUCN	International Union for Conservation of Nature
IWT	Illegal Wildlife Trade
LMS	Lower Mekong Subregion
NGO	Non-governmental Organization
OHHLEP	One Health High-Level Expert Panel (of the Quadripartite Alliance)
OHW-NG	One Health Workforce - Next Generation (USAID program)
PAHO	Pan American Health Organization
PRC	People's Republic of China
RDMA	USAID Regional Development Mission for Asia
RDO	Regional Development Objective
RDW	Reducing Demand for Wildlife
RECOFTC	Center for People and Forests
SARS	Severe Acute Respiratory Syndrome
SEAOHUN	Southeast Asia One Health University Network
SOMHD	Senior Officials Meeting – Health Development
UNEP	United Nations Environment Programme
UNODC	United Nations Office on Drugs and Crime
USAID	United States Agency for International Development

WCS Wildlife Conservation Society  
WHO World Health Organization  
WOAH World Organization for Animal Health

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## ACKNOWLEDGMENTS

The authors would like to express sincere gratitude to the institutions and individuals that provided support and advice during the development of the United States Agency for International Development (USAID) Reducing Demand for Wildlife (RDW) Political Economy Analysis, Civil Society and Social Inclusion Assessment, and One Health Landscape Assessment. The simultaneous research represents a significant undertaking, and its completion would not have been possible without all those who graciously shared their time, insights, and recommendations.

We are grateful to Craig Kirkpatrick, Regional Conservation Advisor, USAID Regional Development Mission for Asia (RDMA) for his leadership, suggestions, and insight. The team also benefited from the consultations with the health sector teams of RDMA and the USAID/Lao PDR Mission, who graciously offered their time and expert insight on One Health. We benefited from consultations with the USAID Mission to the Association of Southeast Asian Nations (ASEAN) representatives who provided keen insights on regional cooperation for the political economy analysis.

The research team is also grateful to the many stakeholders in Cambodia, China, Lao PDR, Thailand, and Vietnam, who agreed to be consulted for this study. Despite continued coronavirus disease 2019 (COVID-19) restrictions, all found time for either in-person or virtual consultations.

*Solutions Lab, LLC*  
*October 2022*



## EXECUTIVE SUMMARY

An estimated 10,000 virus species have the capacity to infect humans. During the past century, every year, two new animal-borne viruses on average have emerged from nature to infect humans.<sup>1</sup> Zoonotic spillover into human populations is driven by habitat destruction and changes in land use and land cover. More than half of the known human pathogenic diseases can be aggravated by climate change.<sup>2</sup> As the global community continues to grapple with the repercussions of the coronavirus disease 2019 (COVID-19) pandemic, an outbreak of monkeypox is now raising concern among public officials in both the United States and in Asia.

Habitat degradation and loss stress wild animal populations, leading to illness. It also compresses wildlife populations, bringing individuals of a species into closer proximity, and bringing disparate species into contact, leading to a greater risk of inter-species disease transmission, and ultimately, to spill over into human populations. At the same time, habitat destruction often creates new habitats for species that are disease vectors, for example by opening the forest canopy for agriculture, leading to warmer water temperatures and improving the habitat for mosquitos<sup>3</sup>. Protecting intact and healthy ecosystems is a cost-effective strategy for protection against emerging infectious diseases. This is a recurring theme in the study.

This One Health Landscape Assessment was commissioned in 2022, during the COVID-19 pandemic, by the United States Agency for International Development (USAID) Regional Development Mission for Asia (RDMA), in conjunction with a Political Economy Analysis and a Social Inclusion Analysis, to provide insight into emerging opportunities to build upon work undertaken in biodiversity conservation in the region, including more than a decade of work to combat wildlife trafficking. It provides a discussion of issues and options for advancing an integrated approach to addressing the inter-related problems of resource degradation, disease emergence, and economic disruption.

Core knowledge questions considered were:

- What is the understanding of the concept of “One Health” in Association of Southeast Asian Nations (ASEAN), and how does the understanding vary between sectors and levels? What are the common threads in understanding? How is the confluence of health and biodiversity understood and characterized in ASEAN?
- What are the trends in ASEAN relating to biodiversity and ecosystem health?
- What are the barriers to knowledge exchange, and data and information sharing on One Health within ASEAN? How do gaps in the jurisdiction, or overlapping jurisdictions, contribute to barriers to progress?

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<sup>1</sup> Dobson, Andrew et al., 2020. “Ecology and economics for pandemic prevention”, *Science* 24 July 2020, Vol 369, Issue 6502, pp 379-381. DOI: 10.1126/science.abc3189

<sup>2</sup> Mora, Camilo et al. Over half of known human pathogenic diseases can be aggravated by climate change. August 8, 2022. *Nature Climate Change* <https://doi.org/10.1038/s41558-022-01426-1>

<sup>3</sup> Robbins, Jim, 2016. “How forest loss is leading to a rise in human disease” *Yale Environment* 360, Feb 23, 2016. Accessed online at: [https://e360.yale.edu/features/how\\_forest\\_loss\\_is\\_leading\\_to\\_a\\_rise\\_in\\_human\\_disease\\_malaria\\_zika\\_climate\\_change](https://e360.yale.edu/features/how_forest_loss_is_leading_to_a_rise_in_human_disease_malaria_zika_climate_change)

Core operational questions considered were:

- How can USAID generate momentum and prevent rollback in policies in a One Health framework in ASEAN? What could that framework look like?
- With USAID support, the ASEAN Senior Officials on Forestry (ASOF) has agreed to develop an ASEAN Strategy for Preventing Zoonotic Diseases Transmission from Wildlife Trade. What are the lessons from this effort that can help to take One Health to scale?
- Can thinking/working politically approaches be employed for adaptive management at the intersection of domestic animal, wildlife, and human health?
- What knowledge management/information exchange tools in the region can contribute to a common understanding?
- Are there examples of successful regional integration of One Health that USAID can share with ASEAN?

The One Health concept emerged from the recognition that ecosystem health, animal health (both wild and domesticated), and human health are allied and interconnected disciplines. And while there is no universally accepted definition of One Health at this time, the general concepts first articulated in the Manhattan Principles (2004) and updated in the Berlin Principles on One Health (see Annex 1) are widely accepted.<sup>4</sup>

The World Health Organization (WHO) defines One Health as “an approach to designing and implementing programs, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes” and the United Nations Environment Programme (UNEP) defines it as “a cross-cutting and systemic approach to health because human health and animal health are interdependent and linked to the health of the ecosystems in which they co-exist”.

USAID’s One Health Working Group defines One Health as:

*One Health is a collaborative, transdisciplinary approach that recognizes the interdependence among the health of ecosystems, wild and domestic animals, and humans to achieve resilient and sustainable outcomes across complex systems from local to global levels.”*

RDMA’s Regional Development Cooperation Strategy has the overall goal of a more resilient, inclusive, and secure Southeast Asia. Regional Development Objective 3 addresses the strengthening of regional environmental and energy systems, and Regional Development Objective (RDO) 4 addresses an improved regional response to health threats. One Health provides the link between these two overarching objectives. This landscape analysis asserts that with regard to emerging infectious diseases, it is extremely difficult, if not impossible, to achieve RDO 4 without progress on the concomitant RDO 3. This strategy puts USAID in a strong position to leverage its assets to

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<sup>4</sup> Gruetzmacher, Kim, William B. Karesh, John H. Amuasi, Adnan Arshade, Andrew Farlow, Sabine Gabrysch, Jens Jetzkowitz, Susan Lieberman, Clare Palmer, Andrea S. Winkler, Chris Walzer, 2021. “The Berlin principles on one health – Bridging global health and conservation” (10 April 2021) *Science of The Total Environment* Volume 764 <https://doi.org/10.1016/j.scitotenv.2020.142919>

achieve these two objectives in tandem. This convergence puts RDMA in a leadership position to chart the path from strategy to implementation at the intersection of health, economic development, and environment within the agency.

As an integrated, systems-based approach, One Health has the potential to be transformative. This is not inevitable, and One Health in practice includes its own limitations and constraints explored in this study. In particular, it must be emphasized that One Health, to be effective, cannot be reactive. It must address the drivers of zoonotic spillovers, many of which are environmental in nature, if we are to prevent future pandemics.

The overlap between a One Health approach and combating wildlife crime is important, but not addressed consistently in practice. The relevance of wildlife and of ecosystem management in general is recognized only superficially by the One Health community in the ASEAN region. This is despite mounting evidence that conservation is central to the containment of zoonotic spillover and is a cost-effective approach. This is addressed in the *Current Situation* section. Kock and Caceres-Escobar maintain that "the vast majority of recurring zoonoses come from domesticated animals and anthropogenically disrupted habitats, directly or through food systems and other vectors, accounting for an estimated 99% of the human incidence." The suggestion, however, that this negates the link between the spread of zoonotic diseases and wild animals including the trafficking of wildlife is strongly contested. Others, such as the Wildlife Conservation Society (WCS), have taken a firm view that the evidence base supports greater focus on addressing wildlife trafficking as part of a One Health framework. However, Kock and Caceres Escobar's emphasis on *recurring* zoonoses coming from domestic animals is relevant, if misleading. It is necessary to recognize that the pathway for zoonotic spillover through domestic animals is significant, especially in conditions where land use and land cover change allow farms to be in proximity to wildlife.<sup>5</sup>

Of particular significance to the ASEAN context is the approach developed with USAID support to cross-sectoral engagement within the ASEAN framework. ASEAN is highly compartmentalized, as discussed in Foundational Factors. USAID can build upon lessons learned in its support for an **integrated and coordinated approach** to combating wildlife crime to address cross-sectoral integration in the One Health context. This is essential if ASEAN is to avail itself of the **transformative qualities and potential of the One Health approach**. This is addressed in the Dynamics in Play section of the report.

The ASEAN region, like most of the world, operates through a crisis-response model. ASEAN's aspirations are to move to a prevention and control model. This landscape review discusses issues and options for this transition. However, most experts consulted for this study suggest that, in hindsight, prevention is only aligned with what has transpired with Severe Acute Respiratory Syndrome (SARS) and COVID-19 which effectively represent a lack of adequate prevention. Furthermore, prevention strategies alone do not adequately anticipate or prepare for new pathogens.

One Health, as one respondent put it, has been misunderstood as being about health, when it is really about the systems in which health happens – the socio-economic and the planetary systems (see discussion in Section 1.2).

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<sup>5</sup> Kock, R. and Caceres-Escobar, H. (2022). Situation analysis on the roles and risks of wildlife in the emergence of human infectious diseases. Gland, Switzerland: IUCN.

## SELECTED FINDINGS

One Health provides a potentially useful model for transformative development consistent with current USAID thinking (q.v., USAID Climate Change Policy).

- To realize this potential, sectoral integration needs to be rethought to address some significant gaps, notably, engagement of the economic sector and economic actors. This is especially important in the ASEAN region, given the strong focus on economic growth and trade. Integration remains problematic even within the One Health discipline. The level of engagement of the public health and domestic animal health with the environment sector is tenuous and requires encouragement and support.
- In ASEAN as in most regions, young professionals comprise the segment of any sector thought to be most amenable to new ways of thinking.
- One important source of support may be the USAID One Health Workforce-Next Generation (OHW-NG), which supports the Southeast Asia One Health University Network (SEAOHUN).

Models of One Health tend to be reactive and focused on known pathogens, when a prevention strategy requires proactive efforts to address unknown pathogens.

- Tools for knowledge exchange are underdeveloped and capacity remains weak.
- Healthy, functioning ecosystems at landscape levels are critical in the protection of human populations from zoonotic spillover. The value of healthy ecosystems to a healthy economy cannot be overemphasized.
- Ecosystems are being progressively degraded by a range of economic activities, and by climate change. The wildlife trade contributes to ecosystem degradation. At the same time, the wildlife trade is a potential conveyor for the transmission of pathogens. It is therefore an important part of an integrated approach to preventing zoonotic spillover. It must be understood in the proper context; combating the wildlife trade is not in and of itself a solution.

## SUMMARY OF RECOMMENDATIONS

The incidence of a zoonotic disease transmission is specific and geospatial and other surveillance tools help to identify and locate these incidents. Global and regional migratory patterns of humans and wildlife, however, challenge efforts to contain the spread of disease. It can be argued that zoonosis is inherently a threat to health security. To that end, the recommendations offered in this study are specific to the RDMA, but are broadly relevant elsewhere.

**Recommendation 1.** Continue to place biodiversity and climate change front and center as part of RDMA's health security and environmental portfolios, recognizing that conservation is an essential component of health infrastructure (see Figure 3 below).

**Recommendation 2.** RDMA should play to USAID's strengths in biodiversity conservation, climate change, health, food security, and economic growth to support a truly integrated regional strategy.

**Recommendation 3.** RDMA's One Health program should develop an economic rationale that can inform economic and trade policies. Ensure that economic actors are part of the conversation about One Health. Quantify the benefits of healthy ecosystems for a resilient society and message these to the private sector and policymakers.

**Recommendation 4.** RDMA should help to build leadership. Raising awareness of the potential benefits of a One Health approach and cultivating champions among senior decision-makers and thought leaders with a clear message that includes Healthy Economy + Healthy Environment = Resilient Society will help to shape the narrative about One Health.

**Recommendation 5.** RDMA should invest in strengthening One Health approaches in the emerging generation of young professionals in the allied health fields, agricultural development, environment, and private sector engagement, leveraging the investments for engagement of students through the USAID OHW-NG program in SEA OHUN.

**Recommendation 6.** RDMA should develop a community based One Health System in support of and in conjunction with ASEAN. This will encourage a regional framework with local application and points of access (e.g., community health clinics, community participation in disease surveillance and reporting, capacity-building for testing and lab analysis).

**Recommendation 7.** Strengthen risk awareness and integrate risk management capabilities across sectors in RDMA. Building on the USAID Global Health program's investments in surveillance, develop and implement predictive risk models to identify existing and emerging hotspots in the ASEAN region.

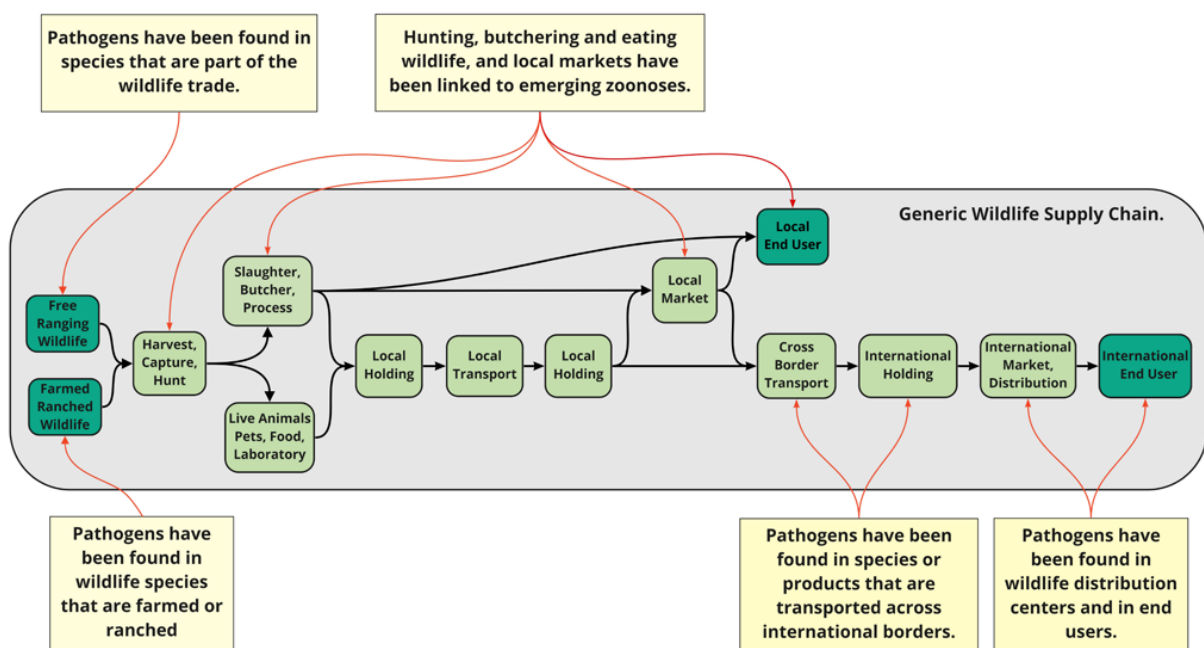
**Recommendation 8.** Develop a flexible multi-donor One Health Action Fund in the ASEAN region to help operationalize a regional One Health framework. National governments will need access to funds to support One Health integration across ministries and sub-nationally.



# I INTRODUCTION

## I.1 BACKGROUND

This landscape review seeks to clarify ASEAN priorities and mechanisms to reduce zoonotic spillover through a One Health approach and identify entry points for USAID to help, particularly as it relates to its existing work in ecosystem health and combating wildlife trafficking (CWT). The illustration in Figure 1 below outlines a generic wildlife trade chain indicating where potential spillover threats might exist, and as governments are now grappling with how to adjust existing policy frameworks to address the risk of zoonotic disease spillover, One Health concepts and methodologies can be advanced to reinforce existing biodiversity conservation work.<sup>6</sup> This report covers the ASEAN region, with a particular focus on the Lower Mekong Subregion (LMS) (Cambodia, Lao PDR, Thailand, Vietnam).



**Figure 1. Generic Wildlife Supply Chain Showing Interfaces at Which Pathogens Have Been Documented (Source: WOA)**

This study takes USAID’s investment in combating wildlife trafficking as the point of departure. As noted throughout this study, the wildlife trade has been described as a “conveyor” transporting wildlife and pathogens across borders and intensifying exposure for humans.<sup>7 8</sup>

<sup>6</sup> Stephen, Craig, Berezowski, John et al., 2021. A Rapid Review of Evidence on Managing the Risk of Disease Emergence in the Wildlife Trade. Preparedness and Resilience Department of the World Organization for Animal Health. Paris, France. [https://web.oie.int/download/WG/Wildlife/OIE\\_review\\_wildlife\\_trade\\_March2021.pdf](https://web.oie.int/download/WG/Wildlife/OIE_review_wildlife_trade_March2021.pdf)

<sup>7</sup> Mira-Salama, Daniel, 2020. “Coronavirus and the ‘Pangolin Effect’: Increased exposure to wildlife poses health, biosafety and global security risks”. World Bank Blogs, March 17, 2020. Accessed online at <https://blogs.worldbank.org/voices/coronavirus-and-pangolin-effect-increased-exposure-wildlife-poses-health-biosafety-and>

<sup>8</sup> Can, Özgün Emre, Neil D’Cruze, David W. Macdonald, 2019. “Dealing in deadly pathogens: Taking stock of the legal trade in live wildlife and potential risks to human health”. *Global Ecology and Conservation*, Volume 17, 2019, e00515, ISSN 2351-9894, <https://doi.org/10.1016/j.gecco.2018.e00515>.

## 1.2 WHAT IS ONE HEALTH?

While there is not a single universally accepted definition of One Health, the general concepts first articulated by the Manhattan Principles and revised by the Berlin Principles described below are generally accepted. In 2003 the Wildlife Conservation Society (WCS) convened a meeting at the International Union for Conservation of Nature (IUCN)'s 5<sup>th</sup> World Parks Congress, resulting in the establishment of the Animal and Human Health for the Environment and Development partnership, which focuses on the wildlife/livestock/human interface in Africa. Due to WCS's interventions, disease and protected areas were identified as a key emerging issue at the Congress. In 2004 the WCS advanced the concept in its "Manhattan Principles," the basis for its One Health, One World campaign (updated in 2021 as the Berlin Principles on One Health, contained in Annex 1). A schematic illustrating the interactions of One Health is provided in Figure 3.

WHO defines One Health as "an approach to designing and implementing programs, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes" and the UNEP defines it as "a cross-cutting and systemic approach to health based on the fact that human health and animal health are interdependent and linked to the health of the ecosystems in which they co-exist".

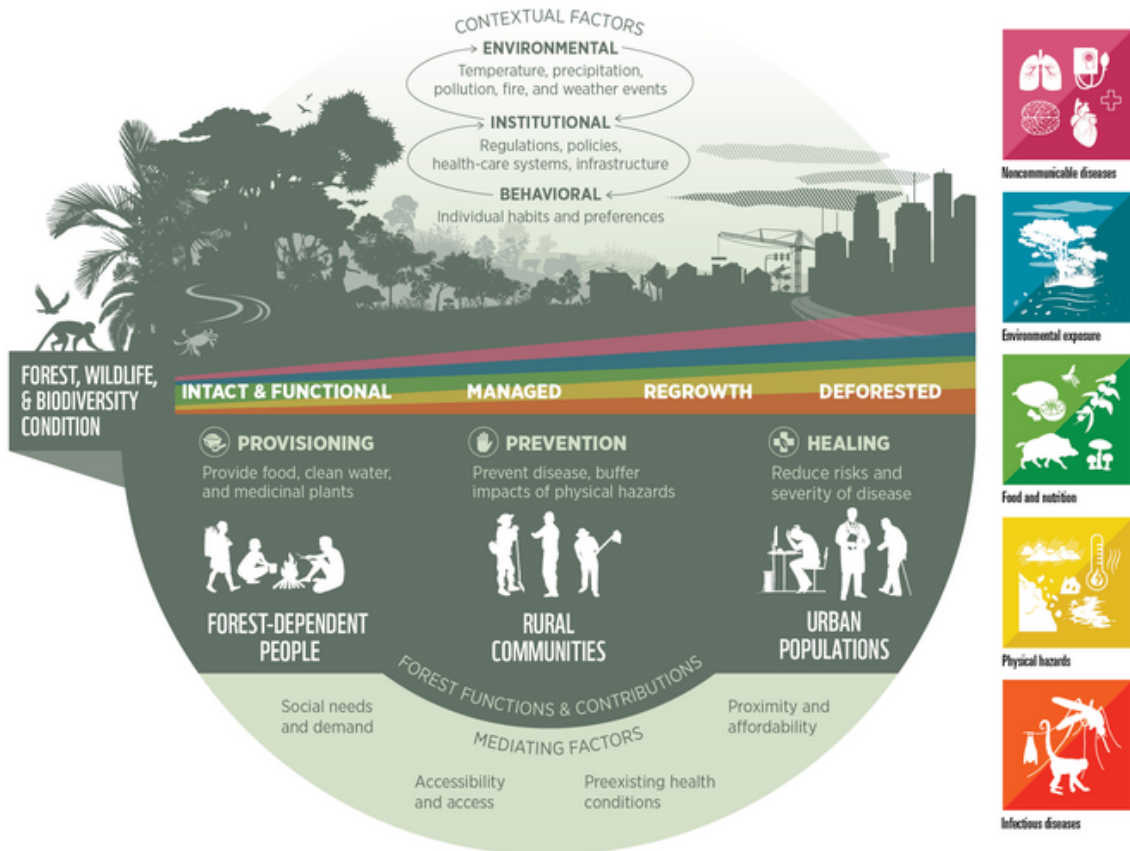
USAID defines One Health as "*a collaborative, transdisciplinary approach that recognizes the interdependence among the health of ecosystems, wild and domestic animals, and humans to achieve resilient and sustainable outcomes across complex systems from local to global levels.*"

Simply put, there is broad agreement that One Health is a systems approach to health at the intersection of ecological health, human health, and drivers of change that is attuned to the complexities of real-world problems. The threat of avian influenza involving migratory birds highlighted the importance of a holistic approach. In 2008, the International Ministerial Conference on Avian and Pandemic Influenza in Sharm el-Sheikh, Egypt, attended by 120 countries, adopted a strategic framework for reducing risks of infectious diseases at the animal-human-ecosystems interface, using a new place-based infectious disease control approach focusing on places where animals, humans, *and ecosystems* overlap. Accordingly, the United Nations Food and Agriculture Organization (FAO), World Organization for Animal Health (WOAH), and WHO, along with the World Bank, United Nations Children's Fund, and United Nations Specialty Insurance Company adopted a joint strategic framework embracing the product of the Ministerial Conference.

Mounting evidence indicates that anthropogenic land use and land cover changes drive a range of infectious disease outbreaks and emergence events and modify the transmission of endemic infections. These cause a cascade of factors that exacerbate infectious disease emergencies, such as forest fragmentation, disease introduction, pollution, poverty, and human migration. The Working Group on Land Use Change and Disease Emergence responded by recommending the establishment of Centers of Excellence in Ecology and Health Research and Training, based at regional universities and/or research institutes with close links to the surrounding communities (Patz et al. 2004, Reaser et al. 2020).



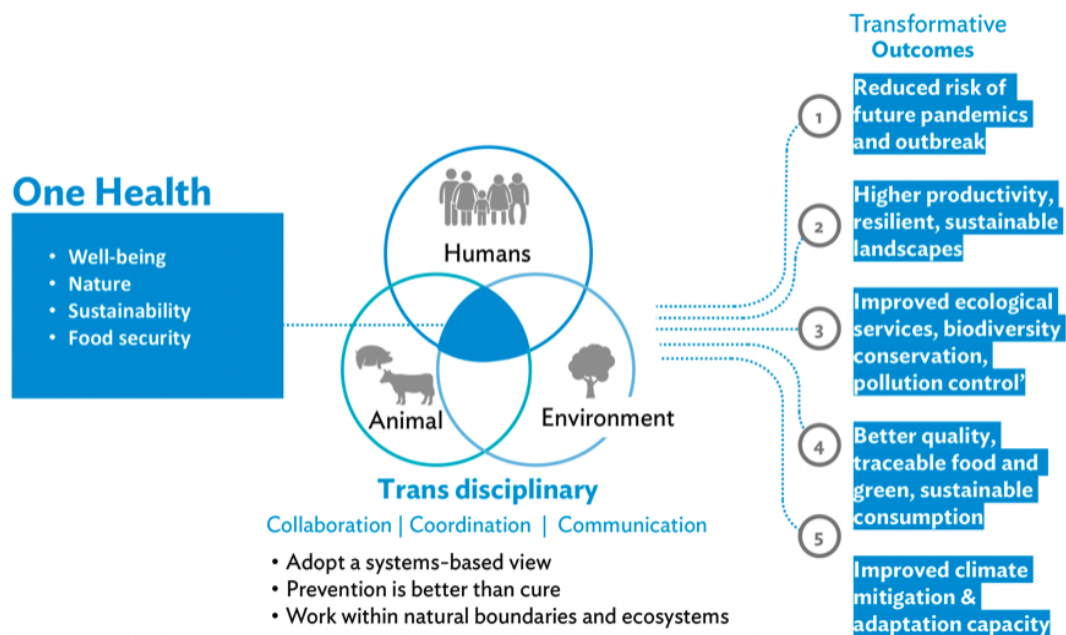
## Forest and human health interactions and the factors that shape them



**Figure 2. Framework for Understanding Forests and Human Health<sup>9</sup>**

In 2009, USAID launched the Emerging Pandemic Threats Program to ensure a coordinated, comprehensive international effort to prevent the emergence of diseases of animal origin that could threaten human health. The program drew upon expertise from across the animal and human health sectors to build regional, national, and local One Health capacities for early disease detection, response, and risk reduction. Also in 2009, a One Health office was established at the United States Centers for Disease Control (CDC) as a focal point. In 2010 the European Union (EU), the United Nations, and the World Bank affirmed commitments to use a One Health approach. FAO, WOA, and WHO produced a concept note in April 2010 proposing a long-term strategic collaboration aimed at sharing responsibilities and coordinating global activities to address health risks that arise when humans, animals, and ecosystems interface. This represented the emergence of the “Tripartite” partnership, which is now a Quadripartite partnership with the addition of the UNEP.

<sup>9</sup> Beatty, C.R., Stevenson, M., Pacheco, P., Terrana, A., Folse, M., and Cody, A. 2022. The Vitality of Forests: Illustrating the Evidence Connecting Forests and Human Health. World Wildlife Fund, Washington, DC, United States.



**Figure 3. One Health Schematic (Source: Asian Development Bank)**

### THE ENVIRONMENT AND PLANETARY BOUNDARIES

As humanity enters a period of rapid and unprecedented change, the concept of Planetary Boundaries is a useful construct to explain why environmental management is a critical component of health infrastructure. A product of the Stockholm Resilience Centre, the concept was introduced in 2009 as the “safe operating space for humanity”.<sup>10, 11</sup> It describes domains where evidence shows that exceeding thresholds can trigger non-linear and abrupt changes to the environment at continental to planetary scales.

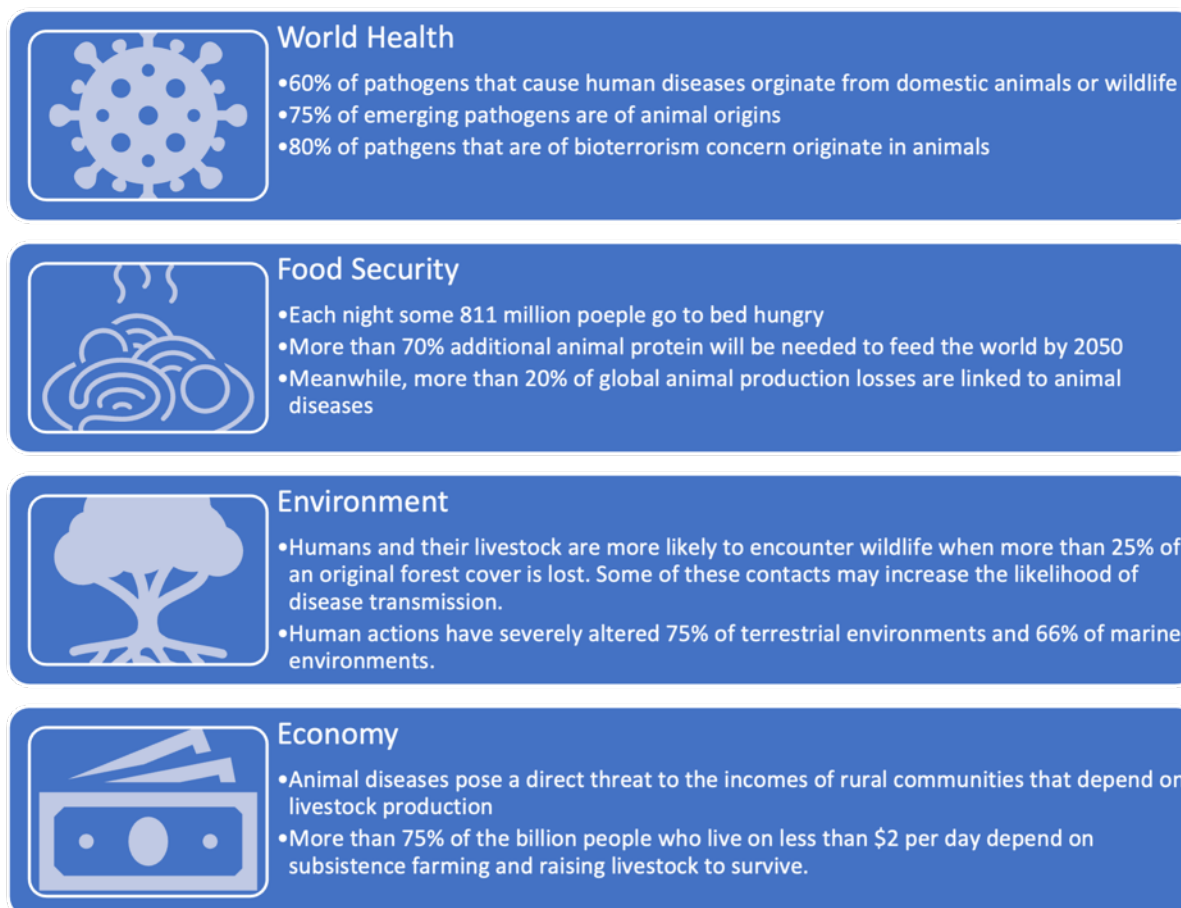
In the context of One Health, degradation in any one of these domains *will* affect biodiversity *and* human health, either directly or indirectly. Of immediate concern for this report is biodiversity. And, because abrupt global environmental change can no longer be excluded from our understanding of risk, planetary boundaries illustrate the delicate balance that societies must maintain, if they are to thrive. Transgression of planetary boundaries is a direct threat to biodiversity, and to human well-being. Humanity has evolved and adapted to this planetary system and relies on it for provisioning, regulating, and supporting services. Society thus requires a balance between the health of ecosystems, the health of our provisioning systems, and human health – hence One Health, which is the notion of planetary boundaries expressed in terms of interlocking systems of well-being.

<sup>10</sup> Rockström, J., W. Steffen, K. Noone, Å. Persson, F. S. Chapin, III, E. Lambin, T. M. Lenton, M. Scheffer, C. Folke, H. Schellnhuber, B. Nykvist, C. A. De Wit, T. Hughes, S. van der Leeuw, H. Rodhe, S. Sörlin, P. K. Snyder, R. Costanza, U. Svedin, M. Falkenmark, L. Karlberg, R. W. Corell, V. J. Fabry, J. Hansen, B. Walker, D. Liverman, K. Richardson, P. Crutzen, and J. Foley. 2009. Planetary boundaries: exploring the safe operating space for humanity. *Ecology and Society* 14(2): 32. [online] URL: <http://www.ecologyandsociety.org/vol14/iss2/art32/>

<sup>11</sup> Steffen, Will, Katherine Richardson, Johan Rockström, Sarah E. Cornell, Ingo Fetzer, Elena M. Bennett, Reinette Biggs et al. "Planetary boundaries: Guiding human development on a changing planet." *Science* 347, no. 6223 (2015): 1259855.

### 1.3 PURPOSE

This assessment reviews the current situation regarding One Health in the ASEAN region, beginning with current USAID-supported efforts to combat illegal wildlife trade (IWT) as a point of departure. It identifies barriers to implementation of a One Health approach, potential champions, and potential points of entry for USAID in advancing biodiversity conservation through a One Health approach. The One Health approach intersects with a wide range of USAID interests and capabilities, as shown in Figure 4 below.



**Figure 4. One Health Facts, from the World Organization for Animal Health<sup>12</sup>**

### 1.4 METHODOLOGY

This study employs a mixed-methods research approach, as well as the gender-responsive and inclusive approach in line with USAID gender and social inclusion norms and standards, guidelines, and requirements. A semi-structured interview instrument provided primary data. Secondary data sources include academic articles, donor and International Non-Governmental Organization (INGO) reports, and key index data, among others.

The research team used purposive sampling to obtain a cross-section of key actors in the wildlife conservation and One Health space in the Lower Mekong subregion (LMS). This informed the development of the data-collection instruments. This purposeful respondent sampling draws from

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<sup>12</sup> WOA, no date. One Health, online, retrieved on 8/7/2022 at <https://www.woah.org/en/what-we-do/global-initiatives/one-health/>

implementation partners, development partners, international non-governmental organizations (INGOs), and a range of non-governmental organizations (NGOs) involved in combating wildlife trade (CWT) at the regional and national levels. The team selected individuals from a list of key stakeholders and beneficiaries prepared in consultation with USAID Reducing Demand for Wildlife staff, and by subsequent “snowballing” by the researchers. The individuals were assumed to possess knowledge of and experience with the topic of interest and, therefore, able to provide information that was both detailed (depth) and generalizable (breadth).

Informants were interviewed on the condition that no specific content would be attributed to any individual, in accordance with best practice in social science research.

## **1.5 STRUCTURE OF THE STUDY**

This study is structured to offer key findings and recommendations, followed by analytical sections reflecting the major themes that emerged from the team’s research. The report concludes with a discussion of areas for further consideration and potential points of entry for USAID.

## **1.6 LIMITATIONS**

The geographic scope was restricted to the four Lower Mekong subregion countries; Cambodia, Lao PDR, Thailand, and Vietnam. The sample size is small, restricted by time constraints and the small target population of experts. The risk of selection bias is present, as interviews were not selected randomly, but conducted with known experts, primarily by referral. These experts could have vested interests in outcomes, as well as personal and professional biases. Timelines involved in obtaining approval and in some cases permission to engage with regional officials limited broader access to government officials.

## 2 FINDINGS

The COVID-19 pandemic imposed a severe economic impact on ASEAN countries. At the peak of the pandemic in 2020, this significantly elevated general awareness of zoonoses and epidemic risk. Experiences with SARS and Highly Pathogenic Avian Influenza have produced a heightened sense of awareness and resulted in an increased technical capacity within the region. The COVID-19 pandemic triggered extraordinary efforts within ASEAN to coordinate management across all ASEAN pillars. Demonstrating that in a crisis, ASEAN can act together for the region's common good. Nevertheless, many of those interviewed expressed concern that these lessons would be gradually forgotten, and that the region would lose focus on risks from zoonoses as it prioritizes an agenda of economic recovery.

### 2.1 FOUNDATIONAL FACTORS

An open question is whether the COVID-19 pandemic has been a shock to the system sufficient to cause “rewiring” to adapt to the new reality and not return to aspects of the pre-pandemic era that may contribute to the risk of zoonosis. ASEAN has succeeded in improving the dynamics in relations between the Member States, and between ASEAN and competing power centers, perhaps beyond expectations<sup>13</sup>. The first challenge is if and how ASEAN can succeed in promoting synergy among conflicting demands *within* its own structure. The next is how regional cooperation on a framework and plan of action can be successfully implemented at the national level. Both questions lead to the fundamental need to identify funding mechanisms with the flexibility to work across domains and at both the regional and national levels of government.

ASEAN is still working towards a comprehensive One Health strategy, even as donors such as the United States and the European Union (EU) press the issue in the region, or in the case of the US, with ASEAN directly through support for the ASEAN Regional Strategic Plan for Preventing Transmission of Zoonotic Diseases from Wildlife Trade<sup>14</sup>. However, an ASEAN One Health accord is reportedly under consideration. ASEAN's highly compartmentalized way of working is not conducive to an integrated approach, and so some technical assistance may be required in this regard. USAID's experience in promoting cross-sectoral cooperation within ASEAN in combating wildlife crime (including USAID's ASEAN Wildlife Enforcement Network Support Program, USAID Asia's Regional Response to Endangered Species Trafficking, USAID Wildlife Asia, and USAID Reducing Demand for Wildlife) can be expected to yield important lessons for One Health. The question of where a One Health mechanism can be most effective within ASEAN is also a subject of debate. Some experts advocate for the establishment of a working group that reports directly to the Secretariat, whereas others see greater benefit in working within an existing technical working group. A review of the ASEAN region health sector noted that ASEAN States lacked cohesiveness in using existing regional health frameworks to develop a coherent pandemic response and that it struggles to have collective measures to address outbreaks.<sup>15</sup> Research for this study validates that perspective with many respondents mentioning gaps in information sharing, limited coordination, and in some cases lower specialized capacity.

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<sup>13</sup> Natalegawa, R.M., 2017. "The expansion of ASEAN and the changing dynamics of Southeast Asia." *Contemporary Southeast Asia*, vol. 39, no. 2, 1 Aug. 2017 <https://muse.jhu.edu/article/667770/pdf>

<sup>14</sup> ASEAN, Draft Outline: ASEAN Regional Strategic Plan for Preventing Transmission of Zoonotic Diseases from Wildlife Trade, (unpublished)

<sup>15</sup> Cardenas NC. 2021. Strengthening ASEAN centrality on COVID-19 relief: a joint multilateral strategic policy J Public Health (Oxf). 2021; fdab183. <https://doi.org/10.1093/pubmed/fdab183>

ASEAN has until now skirted formal recognition of the One Health approach as discussed in Section 1.2 above. In 2010, it defined a “roadmap” to address highly pathogenic emerging diseases among Member States by 2020, using a risk-based approach described as a “translation” of the One Health approach. As noted by Coghlan and Hall, the emphasis on highly pathogenic organisms misses an opportunity to embrace a wider notion of health including the role of wildlife, as well as intersectoral resource integration and communication.<sup>16</sup> This is borne out in the literature and several interviews that note that the emphasis is on monitoring identified diseases (avian influenza, Nipah virus, rabies, tuberculosis, brucellosis, for example) instead of on the ways in which these and other diseases emerge from degraded environments and unsustainable, risky behaviors (see box below).

### **Examples of Behaviors that Amplify Risk of Exposure to Zoonoses**

Based on informant interviews, examples of behaviors that amplify risks of exposure to zoonoses include:

- Wildlife trade (including both legal and illegal trade, especially of live animals), including markets
- Gastronomic tourism involving bushmeat
- Tourism that exposes naïve populations (tourists from urban areas and abroad, and unlikely to have any natural resistance to endogenous zoonoses) to vectors (e.g., visits to bat caves)
- Unregulated development of special economic zones
- Wildlife farming for any reason, including for meat, fur, and traditional medicines
- Release of wild animals that are captive into the environment (including contraband seized from wildlife traffickers)
- Wild animals as pets
- Colocation of domestic animals with wild animals (e.g., piggeries beneath fruit trees that are also bat habitats, intermingling of domestic cattle with wild bovids)
- Colocation of domestic animals with humans
- Any form of human/wildlife conflict
- Encroachment in wildlife habitats, especially, but not limited to, protected areas

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<sup>16</sup> Coghlan, B., & Hall, D. 2013. “The development of One Health approaches in the Western Pacific.” *Current topics in microbiology and immunology*, 366, 93–111. [https://doi.org/10.1007/82\\_2012\\_270](https://doi.org/10.1007/82_2012_270)

The LMS is a “hot spot” for the emergence of *novel* diseases from wildlife, such as COVID-19, as well as antimicrobial resistance.<sup>17,18</sup> This is due to a combination of drivers of disease emergence, including rapid economic development, urbanization, advancing farming systems, demand for livestock products, forest degradation, and deforestation, as well as population increases, and aging. There is a record in the region of re-emerging zoonotic diseases, and the region is a known sanctuary for zoonotic infections.<sup>19</sup> The entire chain of custody in wildlife trafficking, which is widespread in the region, provides a conduit for pathogens from rural areas. This includes hunters, intermediaries who process and transport the wildlife, and the retail markets, including wildlife restaurants, wet markets, pet markets, and traditional medicine outlets. While there is often some resistance to endemic viruses in rural populations, urban populations are more “naïve” (unexposed) according to some experts interviewed. These populations are unlikely to have resistance to zoonoses. Trade across international borders further compounds risks by conveying vectors of disease further away from their point of origin, and into naïve populations, and potentially exposing people in the chain of custody of shipments overseas, including those facilitated by online marketplaces.

## 2.2 CURRENT SITUATION

One Health in the ASEAN region, as explained by many of the experts interviewed, is inconsistent with the Berlin Principles (Annex 1). The interviews and literature review revealed that the public health and domestic animal health sectors do not fully appreciate the role of ecology as a valid component of One Health. This may be exacerbated where environmental representation in national working groups is through a protected area management authority, as protected area management is an applied discipline that may not be strongly tied to research. In general, the understanding of the drivers of zoonotic spillover is influenced by concerns that domestic animals are directly at risk and can become vectors for spillover into human populations. Awareness of the evidence base tying spillover risk and ecosystem health is lacking more broadly. Consequently, the focus on One Health is largely reactive and intent on monitoring the emergence of known zoonoses. The possibility of proactively managing to prevent new introductions is not being adequately addressed. These issues are understood by wildlife biologists and veterinarians working in biodiversity conservation in the region, but inroads into the medical community are, nevertheless, limited.

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<sup>17</sup> Brunton, Lucy A., Andrew P. Desbois, Maria Garza, Barbara Wieland, Chadag Vishnumurthy Mohan, Barbara Häslér, Clarence C. Tam, Phuc Nguyen Thien Le, Nguyen Thanh Phuong, Phan Thi Van, Hung Nguyen-Viet, Mahmoud M. Eltholth, Dang Kim Pham, Phuc Pham Duc, Nguyen Tuong Linh, Karl M. Rich, Ana L.P. Mateus, Md. Ahasanul Hoque, Abdul Ahad, Mohammed Nurul Absar Khan, Alexandra Adams, Javier Guitian. Identifying hotspots for antibiotic resistance emergence and selection, and elucidating pathways to human exposure: Application of a systems-thinking approach to aquaculture systems, *Science of The Total Environment*, Volume 687, 2019, Pages 1344-1356, ISSN 0048-9697,

<sup>18</sup> Morse, Stephen S., Jonna AK Mazet, Mark Woolhouse, Colin R Parrish, Dennis Carroll, William B Karesh, Carlos Zambrana-Torrel, W Ian Lipkin, Peter Daszak, 2012. Prediction and prevention of the next pandemic zoonosis, *The Lancet*, Volume 380, Issue 9857, Pages 1956-1965, ISSN 0140-6736, [https://doi.org/10.1016/S0140-6736\(12\)61684-5](https://doi.org/10.1016/S0140-6736(12)61684-5), (<https://www.sciencedirect.com/science/article/pii/S0140673612616845>)

<sup>19</sup> Wilcox Bruce A., Aguirre A. Alonso, De Paula Nicole, Siriaroonrat Boripat, Echaubard Pierre, 2019. Operationalizing One Health Employing Social-Ecological Systems Theory: Lessons From the Greater Mekong Sub-region. *Frontiers in Public Health* Vol 7, 2019 ISSN=2296-2565 <https://www.frontiersin.org/article/10.3389/fpubh.2019.00085> DOI=10.3389/fpubh.2019.00085

The biodiversity conservation community is itself remiss in not engaging consistently and meaningfully with all relevant sectors as outlined in the Berlin Principles. For example, there is no history of engagement with the public health sector in conservation planning.

For natural resources managers, communities in and around high biodiversity value areas are a front line for zoonotic spillover risk. Careful of such risk, managers of protected areas often strive to provide community health clinics and related services. These clinics in turn, are essential for surveillance of spillover events.

Good examples of a systematic approach linking service provision to communities and planning to minimize exposure to zoonoses were not identified. However, Nigeria is cited by multiple respondents as the best example of One Health implementation across government ministries (see Box 2). Rwanda is also innovating to institutionalize and operationalize an evidence-based, interconnected One Health system across the nation. Rwanda seeks to develop a new generation of systems thinkers to decrease lag-time in responding to events and improve economic efficiency. Barriers cited in Rwanda and Nigeria include competition over budgets, poor communication, and the need for improved technology.<sup>20</sup>

### One Health in Nigeria

In 2019, Nigeria launched a national One Health strategic plan to better manage zoonotic outbreaks through better inter-ministerial coordination. Nigeria set out to serve as the role model for the African continent.

The Nigeria Centre for Disease Control, a unit of the Ministry of Health, coordinates the National Action Plan for Health Security, with strong support from the Ministry of Agriculture. The action plan defines the One Health strategy, and addresses:

- Antimicrobial resistance
- Field epidemiology laboratories and training
- Multisectoral Technical Working Groups organized around specific diseases, such as endemic Lassa fever, an acute viral Hemorrhagic fever transmitted by rodents
- Stockpiling of medical commodities for public health emergencies

Source: Nsofor, Ifeanyi M. (no date) One Health in Nigeria online in *Society for Conservation Biology*, <https://conbio.org/groups/sections/africa/act/one-health-in-nigeria> Accessed 7/16/2022

Experts warn of the likelihood that the next pandemic could emerge within the ASEAN region.<sup>21</sup> Without additional effort to socialize the concept, One Health in ASEAN risks producing another vertically organized business-as-usual approach rather than a horizontally integrated approach to a

<sup>20</sup> Nyatanyi T, Wilkes M, McDermott H, et al. Implementing One Health as an integrated approach to health in Rwanda. *BMJ Global Health* 2017;2: e000121. doi:10.1136/bmjgh-2016-000121

<sup>21</sup> Cecilia A. Sánchez, Hongying Li, Kendra L. Phelps, Carlos Zambrana-Torrel, Lin-FaWang, Kevin J. Olival, Peter Daszak, 2021 (preprint) A strategy to assess spillover risk of bat SARS-related coronaviruses in Southeast Asia medRxiv 2021.09.09.21263359; doi:https://doi.org/10.1101/2021.09.09.21263359



common problem with the potential to transform the relationship between people and their environment. This would be an unfortunate loss because a transformational approach is highly desirable in building social resilience in a rapidly changing world. Climate change is a significant driver of ecosystem degradation, known to create the conditions for zoonotic spillover.

One feature that has been missing from One Health is an authoritative, credible knowledge center analogous to the Intergovernmental Panel on Climate Change and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services to help translate probabilistic models into policy. The Quadripartite Alliance, consisting of UNEP, FAO, WOAHA, and WHO, has launched a One Health High-Level Expert Panel (OHHLEP). Its mandate is to produce a policy-relevant scientific assessment of health crises emerging from the human-animal ecosystem interface and guidance on the long-term strategic approach to reducing the risk of zoonotic pandemics. While these dialogues are still in the discussion stage, USAID should consider where it might add value to accelerate the process and avoid redundancy. This is addressed in the recommendations below.

Likewise, knowledge management resources are lagging, although this situation is changing with donor investments in health infrastructure and the growing sophistication in the region in information and communications technology. Investment is still lagging in the basic science necessary to manage and monitor ecosystems and vector species. As one ecologist interviewed said, “spillover events are outpacing our ability to identify vectors”.

## **2.3 CONSTRAINTS IN THE IMPLEMENTATION OF A ONE HEALTH APPROACH IN ASEAN**

### **INSTITUTIONAL CULTURE OF ASEAN**

In general, senior officials and institutional leadership tend to be orthodox in their approach to problems and should not be looked to for innovation without significant signals from higher-ups. There is a leadership gap at senior levels where champions are required for innovation. “Mavericks” are not encouraged or rewarded in the consensus-oriented culture of ASEAN.

Within ASEAN, decision-making processes are highly compartmentalized, with poor coordination between different functional areas within the Secretariat. This has been the experience in USAID-supported efforts to combat wildlife trafficking (CWT), where conservation, animal health, law enforcement, and trade are separate domains. Through a careful socialization and capacity development process, USAID CWT projects have made inroads, resulting in improved systems for law enforcement and better results on the ground. A similar process will be required with respect to the One Health concept.

### **ONE HEALTH AND THE REGIONAL ECONOMY**

A systematic review of public health interventions showed that the returns on investment were on average 14.3:1.<sup>22</sup> However, a detailed understanding of the tradeoffs between economic priorities and zoonotic disease prevention specifically is still elusive and is complicated by the difficult-to-quantify concept of ecosystem health as an ecosystem service. This is an important knowledge gap, according to some informants.

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<sup>22</sup> Masters R, Anwar E, Collins B, et al. 2017. Return on investment of public health interventions: a systematic review *J Epidemiol Community Health* 2017;71:827-834.

It is perhaps not surprising, therefore, that there is little evidence of pandemic risk management in economic decision-making in the region. Nor is there evidence of participation of economic sectors in One Health. Although implicit in foundational documents like the Berlin Declaration of Principles (Berlin Principles, Annex I), the economic dimensions of zoonotic spillover need to be addressed explicitly.

In ASEAN, economic recovery from the pandemic is a top priority. The ASEAN Comprehensive Recovery Framework provides the regional strategy for recovery from the COVID-19 pandemic.<sup>23</sup> Notably, it does not invoke One Health, and the evidence of meaningful efforts to build pandemic risk management into the economic infrastructure is absent. On the positive side, it includes enhanced cross-sectoral coordination in enforcing wildlife protection laws and improving wildlife habitats through the ASEAN Working Group on the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and Wildlife Enforcement. It also invokes nature-based solutions as a mechanism for the prevention of future pandemics. These may provide entry points for strengthening links with the influential ASEAN Economic Community Department, the Sustainable Development Directorate, and the Health Division of the Human Health Directorate.

Economic considerations loom large in ASEAN. For example, the ASEAN Free Trade Area emphasizes the elimination of tariff and non-tariff barriers, where biosecurity could be interpreted as a technical barrier to trade. Experience from combating wildlife trafficking may be relevant to wider trade engagement in managing disease vectors, including through transshipment of contraband wildlife products and through the accidental introduction of invasive alien species that could be disease vectors. Likewise, economic growth policies drive the development of special economic zones, where in addition to incentives like tax holidays, land use planning rules may be relaxed, facilitating environmental degradation. ASEAN decision-makers are unlikely to enact comprehensive One Health supporting policies at the national level without a clear economic policy that delineates and addresses the most at-risk sectors. Securing the food supply chain is an obvious starting point and can be expanded to include land use policy for commercial agriculture, livestock, and other industries.

The need for strengthened communication across disciplines is a recurring theme in this review. Of the highest importance is the ability to convey persuasively the costs of rash decisions in stark economic terms. One Health proponents must be able to speak fluently in the language of cost-benefit analysis if this conceptual framework is to succeed in a region that prioritizes economic development as its hedge between competing superpowers. Most informants lamented either the lack of engagement with economic actors or the lack of awareness of the economic decisions as drivers of risky behavior. All agree, however, that governments are prioritizing economic recovery and growth.

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<sup>23</sup> ASEAN, 2020 “Comprehensive Recovery Framework”

[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjHylnn25v3AhWog3IEHeHpBs4QFnoECAkQAO&url=https%3A%2F%2Fwww.aseankorea.org%2FaseanZone%2FdownloadFile2.asp%3Fboa\\_filenum%3D4595&usg=AOvVaw2jLUN62DHkUjPds4YV-wzn](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjHylnn25v3AhWog3IEHeHpBs4QFnoECAkQAO&url=https%3A%2F%2Fwww.aseankorea.org%2FaseanZone%2FdownloadFile2.asp%3Fboa_filenum%3D4595&usg=AOvVaw2jLUN62DHkUjPds4YV-wzn)

## BIASES WITHIN THE ONE HEALTH COMMUNITY

For One Health to work, it is essential to understand conservation and natural resource management activities as part and parcel of the overall health infrastructure, bringing ecosystem health in line with animal health and human health.

Some informants remarked on the confusion about who is “in” and who is “out” in national One Health processes. The standing of the environmental community as an integral part of the One Health process is not universally accepted (see Figures 1 and 2). The One Health mission most frequently articulated by the health sector is surveillance and testing rather than preventing spillover through protecting wildlife and their habitats.

One Health is a normative process. Sectoral integration alone will not produce the desired results. A paradigm shift in thinking about the nexus of nature, food production, and human well-being is needed to transform our approach to health to a more comprehensive, inclusive one. This will not be accomplished

without open minds and a willingness to innovate and pilot activities. Senior managers are rewarded and promoted for a steady hand and commitment to the mission and are unlikely to deviate from routine. This includes changes in government policies that prevent One Health approaches from being funded. Some informants highlighted the importance of working with the next generation of leaders through young professional organizations. Mentoring and empowering those who haven’t already been subsumed into the bureaucratic constraints of institutions may be the most practical way to build a longer-term and sustainable culture for One Health.

## LACK OF FINANCIAL SUPPORT

A regional One Health agreement or strategy is unlikely to be effective without available resources, and there is no evidence of a process to determine the financial requirements of a regional One Health mechanism in ASEAN. Elevation of One Health requires science, knowledge management, and investment in people. Host countries and donors support ASEAN Centers, and being donor driven, they tend to focus on narrow missions to fit within available resources and donor priorities.

Developing a regional accord would benefit from a realistic discussion about costs and sources of support. Without engagement from the donor community and the financial sector, an effective process may be elusive. The *Political Economy Analysis: Regional Cooperation in Countering Wildlife Trafficking in Southeast Asia* commissioned by USAID’s Reducing Demand for Wildlife activity offers insight into potential financial instruments including a regional trust fund and green investment bonds.

In the ASEAN region, it has long been evidenced by government decisions that economic growth is the top priority. In the COVID-19 aftermath, political will has moved to support key economic sectors directly related to economic recovery. The restoration of the tourism and ecotourism sectors, securing supply chains (especially in the food industry), and improving commercial agriculture intersect with government recovery plans and wildlife considerations to the extent that CWT will contribute to and not detract from the economic recovery.

Pairing a regional One Health framework with green finance instruments to support recovery in key sectors could offer the opportunity for green growth and conservation to “build back better” from the pandemic and build upon its lessons to prevent or lessen the impact of future spillover events. This could include support for ecological restoration, protection of high value biodiversity areas that are also areas of potential spillover risk, and improved community and overall economic resilience.

ASEAN can use Green bonds, green banking, or blended finance to allocate resources from impact investors, philanthropic donors, governments, and multilateral organizations to initiatives directly related to conservation as health infrastructure. Some of these instruments (e.g., Green, Social and Sustainability Bonds) are already being used by countries like Thailand, the Philippines, and Vietnam. Work is underway to establish a green taxonomy to provide a clear and common definition of sustainable activities in ASEAN. The specifications of such a funding mechanism should be the subject of a separate study to outline issues and options for its establishment, including legal status, governance, and optimal financing strategies.

## 2.4 DYNAMICS IN PLAY

As an integrated, systems-based approach, One Health has the potential to be transformative, by influencing and shaping societal understanding of systemic risk and enlisting a coordinated and comprehensive approach to risk management. This will require a holistic understanding of risks. Interviews revealed a lack of consensus on exactly what the risks are and what specific steps need to be taken to reduce those risks. For example, within the conservation community, there are differing views on whether to regulate or ban the wildlife trade. There are also varying views on zoonotic disease transmission and whether the focus should be more squarely on domestic or wild animals. Kock and Caceres-Escobar argue, for example, that emergence and spread of zoonotic diseases is overwhelmingly the result of how humans manage domestic animals whereas the conservation community and stakeholders more broadly recognize that the trafficking of wildlife and their parts and products is significant and also requires close scrutiny.<sup>24</sup> These differences complicate the process of producing a cogent argument for policy makers. Similarly, respondents consulted for this study continue to express skepticism about the species and activities that create the highest risk for animal-to-human disease transmission. Several respondents referred to the CITES list as the only basis for this judgment while veterinary health experts point out that the greatest risk is not from endangered species covered under CITES. For example, data describing the ecology of bat populations constituting reservoirs of Nipah virus can help to make projections about the types of environments expected to support cases of human disease.<sup>25</sup> Understanding the human and bat interplay could help to inform policies about the management of species and habitats and the regulation of human uses regardless of CITES status.

## BIODIVERSITY

Zoonotic spillover is a *biosecurity* issue and cannot be addressed without consideration of ecological health and planetary boundaries, as discussed in 3.2 above. Southeast Asia encompasses four biodiversity hotspots (Indo-Burma, Sundaland, the Philippines, and Wallacea) and is characterized by rich biodiversity and high degrees of endemism.<sup>26</sup> Consequently, there is substantial biodiversity conservation activity underway in these regions. Over the last few decades, the focus of some donors, including USAID, has expanded to address the trade in illegal wildlife, both for domestic consumption and for transshipment to other countries, especially China as there was increasing recognition of the impact it was having on biodiversity. The illegal wildlife trade precipitated a

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<sup>24</sup> Kock, R. and Caceres-Escobar, H. (2022). Situation analysis on the roles and risks of wildlife in the emergence of human infectious diseases. Gland, Switzerland: IUCN.

<sup>25</sup> Walsh M.G. Mapping the risk of Nipah virus spillover into human populations in South and Southeast Asia. *Trans. R. Soc. Trop. Med. Hyg.* 2015;109:563–571.

<sup>26</sup> Koh, Lian Pin, Chris J Kettle, Douglas Sheil, Tien Ming Lee, Xingli Giam, Luke Gibson, Gopalasamy Reuben Clements. Biodiversity Status and Trends in Southeast Asia, in Levin, Simon A., *Encyclopedia of Biodiversity*, second edition. 2013. Elsevier Science, Amsterdam 5484 p.

dramatic decline in populations of species indigenous to Southeast Asia, including tigers and pangolins, as well as species elsewhere including pangolins, elephants and rhinoceros in Africa.

The focus on the regulation of trade and enforcement measures may have deflected some attention from overall ecosystem functionality and health, including important work undertaken to address the valuation of ecosystem services and promote resilience to climate change. And, at the same time, this has resulted in significant awareness raising, as well as improved national capacity and regional cooperation to prevent unregulated trade that is associated with zoonotic transmission risk. The challenge now is to address the impacts of defaunation, restore degraded ecosystems and wildlife populations, and significantly, improve resilience in the face of climate change, including through the provision of nature-based solutions. Maintaining the integrity of the remaining natural systems is essential for ecosystem services in general, and, particularly, in protecting public health.

IUCN's draft guidelines for prevention, detection, response, and recovery from disease risks in protected and conserved areas<sup>27</sup> recommends that disease risk be integrated into land and marine area planning. It identifies key interfaces, including tourism, communities in and around conserved areas, access, and resource use, research, and biodiversity management as key interfaces associated with zoonotic disease risk. Conservation area managers can support communities through risk communication and through the provision of vaccines and prophylaxes, and changes in ways that communities manage and consume wild and domesticated animals. They also recommend participatory approaches that engage communities and other stakeholders on disease risk reduction and preparedness, including, for example, identifying high-risk species or areas where subsistence hunting by indigenous groups should not be carried out during epidemic periods. The IUCN draft guidelines also stress the need to assess risks prior to any reintroductions of wildlife, including seizures of live animals in wildlife trafficking.

## LAND USE

Mounting evidence indicates that anthropogenic land use and land cover changes drive a range of infectious disease outbreaks and emergence events and modify the transmission of endemic infections. These cause a cascade of factors that exacerbate infectious disease emergence, such as forest fragmentation, disease introduction, pollution, poverty, and human migration. To address this relationship, the *ad hoc*, International Working Group on Land Use Change and Disease Emergence, consisting of international scientific experts in infectious diseases, ecology, and environmental health, recommended the establishment of Centers of Excellence in Ecology and Health Research and Training, based at regional universities and/or research institutes with close links to the surrounding communities.<sup>28, 29</sup> In Southeast Asia, the closest proximity to such centers is the Southeast Asian One Health University Network (SEAOHUN). SEAOHUN, described in more detail below, supports health professionals to sharpen their skills for problem-solving at the human-animal interface. SEAOHUN falls short in terms of linkages with communities, and in its focus on the health

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<sup>27</sup> IUCN. Protecting People and Wildlife: draft Guidelines for Prevention, Detection, Response, and Recovery from Disease Risks in Protected and Conserved Areas, March 13, 2022. Unpublished.

<sup>28</sup> Patz J, P. Daszak, G M Tabor, A. Aguirre, M. Pearl, J Epstein, N D Wolfe, A M Kilpatrick, J. Fofopoulos, D Molyneux, D J Bradley, 2004. Working Group on Land Use Change and Disease Emergence. Unhealthy landscapes: Policy recommendations on land use change and infectious disease emergence. *Environ Health Perspect.* 2004 Jul;112(10):1092-8. doi: 10.1289/ehp.6877. PMID: 15238283; PMCID: PMC1247383.

<sup>29</sup> Reaser, Jamie K., Gary M. Tabor, Daniel J Becker, Philip Muruthi, Arne Witt, Stephen J Woodley, Manuel Ruiz-Aravena, Manuel, Jonathan A. Patz, Valerie Hickey, Peter J Hudson, Harvey Locke, and Raina K Plowright, 2021. *Parks Journal*, IUCN, Gland. <https://doi.org/10.2305/IUCN.CH.2021.PARKS-27-SIJKR.en>

sector, but provides an important foundation that can be built upon to meet the needs that have been articulated with regard to the interface between land-use change and disease emergence.

In Southeast Asia, the intersection of land use with environmental and indigenous rights movements will require engagement with new constituencies and create new pathways from an ASEAN One Health Framework to communities. Research for the USAID Reducing Demand for Wildlife activity's Civil Society and Social Inclusion study suggests that engaging with indigenous peoples (IP) and forest-reliant communities across the region on CWT/IWT or One Health will require USAID to link One Health with governance programs. Specifically, this will involve activities that address land rights and other basic rights that regional IP networks are coalescing around.

### ONE HEALTH AT THE COMMUNITY LEVEL

Several programs have integrated the One Health approach into community-level development. Berrian et al. describe a training program to advance disease risk assessment and mitigation skills among agro-pastoralists living adjacent to conservation areas in South Africa.<sup>30</sup> Among recipients of training, 98 percent implemented risk-mitigation strategies. Approaches such as this can both mitigate risk in high-risk areas and provide additional early warning capabilities through enhanced surveillance. Likewise, the USAID-supported MEASURE Evaluation activity implemented a pilot community event-based surveillance approach to zoonotic diseases using community health volunteers in Senegal. This project used a mobile data collection platform (RapidPro-based InfoSanté), to include six prioritized zoonotic diseases. Community volunteers used this platform to record disease signals in their respective communities and notify the nearest primary care nurse or livestock officer of disease events. The system also notifies the district health office or Departmental Service for Livestock, and a joint investigation is initiated with the appropriate stakeholders. Evaluation of the pilot indicated that public recognition of volunteer services was critical in keeping community volunteers motivated and that they should be encouraged to share their experiences in monthly meetings with government officials.<sup>31</sup>

In Indonesia, the Indonesian Red Cross, with support from the International Federation of Red Cross and Red Crescent Societies, and USAID, has implemented a Community Epidemic and Pandemic Preparedness Program for pilot communities in Java and Bali. Here, a volunteer network, working in coordination with the Ministry of Health and the Ministry of Agriculture, Animal Industry and Fisheries and coordinated by the Indonesian Red Cross, provides a community-based surveillance system, and with it, the capacity to provide a rapid response to a disease outbreak. The program also promotes risk reduction within communities.

In South America, there is a long experience in working with and through grassroots movements in bottom-up community approaches, including for the prevention and control of diseases. Here, there is an explicit effort to draw on indigenous health traditions, supported by the Pan American Health Organization (PAHO). PAHO has supported multisectoral approaches, especially to veterinary health, since 1968. The emergence of previously unidentified species of pathogens and co-infections here has intensified the interest in neglected and emerging pathogens, and researchers are seeking a better understanding of the types of contact between human and animal populations. The presence

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<sup>30</sup> Berrian, Amanda M., Martin H. Smith, Jacques van Rooyen, Beatriz Martínez-López, Monica N. Plank, Woutrina A. Smith, Patrick A. Conrad. A community-based One Health education program for disease risk mitigation and the human animal interface. 2018. *One Health* 5 (2018), 9-20.

<sup>31</sup> USAID. Community Event-Based Surveillance of Priority Human and Zoonotic Diseases in Senegal. 2019. ISBN: 978-1-64232-187-6 USAID, Washington.

of indigenous, often neglected tropical diseases in remote tropical communities, such as zika, dengue, Chagas disease, hanseniasis, leptospirosis, leishmaniasis, yellow fever, and parasitic diseases, has driven the need for interdisciplinary partnerships. Indigenous communities in particular experience very high disease burdens.<sup>32</sup>

In Brazil, universities have, since 2012, employed interdisciplinary outreach programs, working with communities through a *Sistema Único de Saúde* or Unified Health System. In the mid-2010s, the Federal Rural University of Pernambuco initiated an innovative graduate program leading to a professional Master's Degree in One Health with three tracks; primary health care, epidemiology, and health planning. Around the same time, Adolfo Ibáñez University introduced the world's first course in One Health for non-biological students in Chile. In Chile and Colombia, the national approach is driven by their medical professionals and medical students and is highly networked, including information and communications technology. Colombia's National One Health Network includes outreach efforts to youth groups and to the most remote and vulnerable communities.<sup>33</sup>

Riley et al., responding to the high disease burdens of indigenous populations, reviewed One Health research in twenty-four studies in North America, Africa, Australia, South America, and Central America.<sup>34</sup> Their study identified gaps to be addressed in terms of engagement with indigenous viewpoints and the need for integration of indigenous perspectives in research.

Considering the valuable experiences in community engagement in One Health in Africa, the Americas, and Asia, the potential to identify best practices and to develop an approach specific to the ASEAN context would provide a potentially useful way to advance One Health integration across the region.

## CLIMATE CHANGE

Animal-to-human transmission (spillover) is influenced by socioeconomic processes such as land use and environmental factors. These processes reshape reservoir hosts through reduction in range, changes in population density and crowding, overall health and nutrition, and proximity to other species. Human land-use changes also produce greater risk of human-wildlife interaction. Hazards associated with rapid environmental change include direct risk (e.g., extreme weather events, wildfire) and indirect risks (environmental factors affecting spillover risks, such as habitat change and impacts on phenology). It is thus inevitable that climate adaptation converges with the One Health approach. Zhang et al. proposed a One Health approach to respond to the climate change crisis.<sup>35</sup> This dynamic will play out in the coming decade in ASEAN, where climate change threatens to reverse the economic success of the ASEAN Member States. There is very limited interaction in the

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<sup>32</sup> Pettan-Brewer C, Martins AF, Abreu DPBd, Brandão APD, Barbosa DS, Figueroa DP, Cediel N, Kahn LH, Brandespim DF, Velásquez JCC, Carvalho AAB, Takayanagi AMM, Galhardo JA, Maia-Filho LFA, Pimpão CT, Vicente CR and Biondo AV. From the Approach to the Concept: One Health in Latin America - Experiences and Perspectives in Brazil, Chile, and Colombia. *Front. Public Health* 9:687110. doi: 10.3389/fpubh.2021.687110

<sup>33</sup> Pettan-Brewer et al., loc cit.

<sup>34</sup> Riley, T.; Anderson, N.E.; Lovett, R.; Meredith, A.; Cumming, B.; Thandrayen, J. One Health in Indigenous Communities: A Critical Review of the Evidence. *Int. J. Environ. Res. Public Health* 2021, 18, 11303. <https://doi.org/10.3390/ijerph182111303>

<sup>35</sup> Zhang, R., Tang, X., Liu, J., Visbeck, M., Guo, H., Murray, V., McGillicuddy, C., Ke, B., Kalonji, G., Zhai, P. and Shi, X., 2022. "From concept to action: a united, holistic and One Health approach to respond to the climate change crisis". *Infectious Diseases of Poverty*, 11(1), pp.1-6. <https://idjournal.biomedcentral.com/track/pdf/10.1186/s40249-022-00941-9.pdf>

region at the interface of One Health and climate change, further evidence that the integrative qualities of the One Health approach are not yet evident in the region.

Climate change is expected to cause displacement, exacerbating potential conflicts in the South China Sea and the Mekong Delta. Sea level rise is expected to increase by a meter by 2100, putting 38 percent of the Mekong Delta underwater. Already, as much as half of the *arable* land may be inundated by rising sea levels. Excessive resource extraction exacerbated by rising temperatures in the region has already depleted fish stocks, one of the primary food sources for many communities, by a third over the past thirty years.

Some experts expressed that One Health communication – particularly to policy-makers and the public – should learn from the mistakes made by the scientific community in the earlier spillover events and in the early days of climate change and not repeat those with One Health now. These mistakes included the provision of poor or inconsistent information, which is to be expected in a developing emergency. But without transparency that the system is operating under conditions of uncertainty, sudden policy reversals could be, and were, interpreted as vacillation and science suffered from eroding public trust. Perhaps more significantly, efforts to reassure the public may have invoked a nostalgia for prior conditions, conveying that the goal was to get back to “normal”, and not communication early enough that there could be no return to business as usual.

#### CAPACITY TO MANAGE PROACTIVELY

In the global One Health initiative, predictive models often focus on a narrow range of risk factors and are rarely scaled to ecosystem use. In the future, the One Health approach can be expected to produce demand for more informative disease models such as the cited model for a fatal tick-borne viral hemorrhagic disease, Kyasanur Forest Disease, that is spreading across degraded forest ecosystems in India<sup>36</sup>. Cross-disciplinary work identified key risk factors across the relevant policy sectors to understand patterns and develop decision-support tools. Georeferenced data and spatial machine learning were used to quantify the role of risk factors such as forest cover and loss, host densities, and public health access, as drivers of landscape-scale disease patterns. Models predicted new hotspots of outbreaks, demonstrating value in targeting interventions. The authors of the study stressed the importance of co-production of knowledge to acquire critical data and to better understand the context. They argue this interdisciplinary approach to risk prediction is applicable across zoonotic diseases in tropical settings.

There are significant data limitations in the modeling of vector behavior, even assuming that the vectors are known. However, modeling of land use and habitat data, and human behavior, are possible with available data. The challenge is not the ability to model risk, but how the information is used to inform policy. In general, there is a lack of ability to translate evidence into the language of the policy, and economic risk in particular, as discussed in the Constraints section above. The issue is dismissed by many informants as a lack of political will. Interviews and the review of available literature suggest that the issue is more nuanced and relates to the difficulty in processing tradeoffs

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<sup>36</sup> Purse BV, Darshan N, Kasabi GS, Gerard F, Samrat A, et al. “Predicting disease risk areas through co-production of spatial models: The example of Kyasanur Forest Disease in India’s forest landscapes” (2020). PLOS Neglected Tropical Diseases 14(4): e0008179. <https://doi.org/10.1371/journal.pntd.0008179>



between clear value propositions in development and murkier, complex notions of public good in a precautionary approach to land-use policies.

Policy-makers in ASEAN countries will have no choice but to address wicked problems in dynamic systems, especially adaptation to climate change. Compounding the situation with detailed explanations of the complexities involved in preventing zoonotic spillovers, while unavoidable, is almost certainly unwelcome.

## 2.5 KEY ACTORS AND INSTITUTIONS

### ASEAN

ASEAN was founded to address regional cooperation and integration, based upon principles of sovereignty and non-interference. It has focused since its inception on regional economic growth, and regional peace and security. Technical matters including health and the environment are addressed under the rubric of regional integration. The ASEAN Community is organized around three pillars; the ASEAN Political-Security Community, the ASEAN Economic Community, and the ASEAN Socio-Cultural Community. Health and the environment reside within the Socio-Cultural Community.

The ASEAN Health Ministers govern ASEAN Cooperation in Health and the ASEAN Senior Officials Meeting on Health Development (SOMHD). The ASEAN Health Sector responded relatively quickly to the COVID-19 pandemic (“the pandemic”) using a “whole of system and whole of government” approach under the SOMHD “Plus 3” (including China, the Republic of Korea, and Japan). ASEAN adopted a 2019-2025 Plan of Action to operationalize the *ASEAN Leaders’ Declaration on Disaster Health Management (DHM)*. This plan stipulates enhancing regional cooperation on DHM, multisectoral participation, and the integration of health management frameworks into national legal and regulatory frameworks. The multisectoral dimension references humanitarian assistance and military cooperation but does not specifically call out either the environmental or livestock sectors. It focuses exclusively on post-hoc disaster response and doesn’t address disease surveillance. Despite these gaps, the SOMHD provides an example of ASEAN coming together rapidly and cooperatively to address a regional challenge.

According to several informants, livestock experts are the most enthusiastic drivers of the One Health approach in the region. Animal health falls under ASEAN Cooperation in Food, Agriculture, and Forestry, governed by the ASEAN Ministers of Agriculture and Forestry (AMAF), and overseen by a Seniors Officers Meeting of AMAF. Important sectoral working groups include livestock, agricultural research and development, crops, etc. Animal health is concentrated under the ASEAN Sectoral Working Group on Livestock.

### NATIONAL GOVERNMENTS

ASEAN plays a key role in reducing conflict between Member States. The ASEAN Charter is explicit in recognition of national sovereignty, and unlike other regional organizations, it reinforces sovereignty and strengthens national capacity.<sup>37</sup> National governments are, therefore, the prime

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<sup>37</sup> Ginsburg, Tom. "The State of Sovereignty in Southeast Asia," American Society of International Law Proceedings Vol 99, p419 (2005).

actors in every ASEAN initiative. These initiatives are directed by governance mechanisms (e.g., working groups) composed of high-level officials representing the Member States.

The Global Health Security Index measures the capacity of 195 countries to prepare for epidemics and pandemics.<sup>38</sup> Rankings for 2021 for ASEAN Member States are in Table I. Unfortunately, similar data at this level of detail is not available for biodiversity, despite its relevance and desirability.

Even the poorest states in the region rank above the global average, and all but one report improvements in capacity since the previous biannual assessment. The index for 2021 shows that worldwide, most countries have not made dedicated financial investments in strengthening epidemic or pandemic preparedness. They also made little or no improvement in maintaining a robust, capable, accessible health system for outbreak detection and response. It concludes that countries worldwide are not prepared to prevent globally catastrophic biological events that could cause damage on a larger scale than COVID-19.<sup>39,40</sup>

**Table I. Global Health Security Index Rankings for ASEAN Member States 2021**

ASEAN MEMBER STATE	RANK (OUT OF 195)	INDEX SCORE (GLOBAL AVERAGE = 28.4)	CHANGE FROM 2019	RANK IN SOUTHEAST ASIA REGION
Brunei Darussalam	64	43.5	+0.5	6/11
Cambodia	126	31.1	+0.1	10/11
Indonesia	45	50.4	+1.2	4/11
Lao PDR	99	34.8	+2.0	9/11
Malaysia	27	56.4	+1.3	3/11
Myanmar	85	38.3	+0.5	8/11
Philippines	57	45.7	+2.2	5/11
Singapore	24	57.4	+1.6	2/11
Thailand	5	68.2	-0.7	1/11
Vietnam	65	42.9	+0.7	7/11

Delving into the data reveals slippage in prevention capabilities. Table 2 shows declining capabilities in prevention, including significantly, of zoonotic diseases. A sharp decline was reported for five of the ten ASEAN Member States in zoonotic disease management capacity between 2019 and 2021.

<sup>38</sup> Accessible at <http://www.ghsindex.org/about/>, the Global Health security Index is produced by a partnership of the Johns Hopkins University Center for Health Security, the Nuclear Threat Initiative, and is developed with the assistance of the *Economist Impact*. Its most recent assessment is for 2021. It assembles an international panel of experts to review data on six pillars of health security: prevent, detect, respond, health, norms, and risks.

<sup>39</sup> <https://www.ghsindex.org/report-model/>

<sup>40</sup> Bell, Jessica and Jennifer B. Nuzzo, *Global Health Security Index: Advancing Collective Action and Accountability Amid Global Crisis, 2021*. Available at [www.ghsindex.org](http://www.ghsindex.org)

**Table 2. Global Health Security Index Prevention rankings for ASEAN Member States 2021**

ASEAN MEMBER STATE	PREVENTION SCORE	CHANGE FROM 2019	ZOONOTIC DISEASE INDICATOR	ZOONOTIC DISEASE CHANGE FROM 2019
Brunei Darussalam	30.1	+8.1	18.4	+11.4
Cambodia	24.8	+7.3	40.6	+19.0
Indonesia	31.8	-3.4	42.0	-20.0
Lao PDR	18.7	+7.9	8.0	+5.7
Malaysia	37.7	-7.5	23.9	-20.0
Myanmar	21.7	-3.3	26.3	-19.8
Philippines	27.7	0	17.3	-0.1
Singapore	46.8	-3.4	19.7	-19.9
Thailand	59.7	-4.2	64.1	0
Vietnam	40.3	-3.4	26.1	-20.1

Note: Author's emphasis

Data used for zoonotic disease management analysis in the Global Health Security Index is found in Table 3.<sup>41</sup>

**Table 3. Zoonotic Disease Management Criteria**

ZOONOTIC DISEASE MANAGEMENT CRITERIA
Presence or absence of national legislation, plans, or equivalent strategy documents
Presence or absence of national legislation, plans, or equivalent strategy document(s) that include measures for risk identification and reduction for zoonotic disease spillover events
Presence or absence of national legislation, plans, or guidelines that account for the surveillance and control of multiple zoonotic pathogens of public health concern
Presence or absence of a department, agency, or similar unit dedicated to zoonotic disease that functions across ministries
Presence or absence of a national mechanism (either voluntary or mandatory) for owners of livestock to conduct and report on disease surveillance to a central government agency
Presence or absence of legislation and/or regulations that safeguard the confidentiality of information generated through surveillance activities for animals (for owners)?
Presence or absence of surveillance of zoonotic disease in wildlife
Presence or absence of a report to WOAHA on the incidence of human cases of zoonotic disease for the past calendar year
Number of veterinarians per 100,000 people
Number of veterinary paraprofessionals per 100,000 people

<sup>41</sup> Bell, Jessica and Jennifer B. Nuzzo *loc cit*

Presence or absence of mechanisms for working with the private sector in controlling or responding to zoonoses

Source: Bell and Nuzzo, 2021

## COMMUNITIES

The very top-down initial response of the international public health system to the 2013-2016 Ebola crisis in West Africa experienced strong community resistance because the draconian approaches were an affront to community values and mores.<sup>42</sup> Responding to this experience, the Kampala Manifesto articulates locally focused, community-based responses to spillover events.<sup>43</sup>

As one informant noted, rural communities are the front line of both conservation and spillover risk. Community-based natural resource management (CBNRM) has been orthodox conservation practice for several decades. It is conventional practice for conservation programs to provide benefits to communities adjacent to conservation areas; this frequently includes providing basic health care through a clinic or dispensary. Increasingly, conservation programs are engaging communities on health risk factors as well, such as bushmeat consumption and co-mingling of domestic animals and wildlife. Enlightened conservation practice treats communities as an asset rather than a threat but research for the corollary study on social inclusion indicates that negative attitudes about and exclusion of indigenous people and forest-reliant communities persist and contribute to marginalization.

Communities are at the front lines of surveillance, as well. Conservation planning does not yet extend to the engagement of public health authorities in conservation and land-use planning, but inroads are being made. Thailand is referenced as the model of a community-based health system in the ASEAN region, having invested heavily in its primary health care system, with a primary health care center in each of 9,762 sub-districts, and community hospitals in 90 percent of its districts. This investment creates an enabling environment for a Community One Health system and could serve as the model for effective engagement with communities on One Health in the region.

The integration of practical One Health approaches relevant to rural communities into CBNRM and rural development is emerging, but there is no discussion of it yet in the ASEAN context. The development of a community-level approach in the ASEAN region has the potential to yield positive results and would provide opportunities to address issues such as gendered roles, youth engagement, and marginalization.

## OTHER MULTILATERAL ORGANIZATIONS

**The Quadripartite Alliance for Global Health** is an alliance of four important multilateral organizations (**FAO, WHO, WOA, and UNEP**) that have banded together to drive an integrated One Health program through sectoral integration at the international organization level. The alliance features a Joint Plan of Action, informed by the OHHLEP high-level panel. This panel is presently dominated by zoonotic disease experts, and would significantly benefit from expertise in ecosystem health, climate change, and social sciences. As the newest member and the one with an

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<sup>42</sup> Richards, Paul, *Ebola: How a People's Science Helped End an Epidemic (African Arguments)*, London, Zed Books, (2016) 192 pp. ISBN 978-1783608584

<sup>43</sup> Dickmann P, Kitua A, Apfel F, Lightfoot N. 2018 Kampala manifesto: Building community-based One Health approaches to disease surveillance and response—The Ebola Legacy—Lessons from a peer-led capacity-building initiative. *PLoS Negl Trop Dis* 12(4): e0006292. <https://doi.org/10.1371/journal.pntd.0006292>.

ecosystem mandate, UNEP's influence may help to augment the panel and if necessary, broaden its purview. Thematic Group 4 of the Joint Plan of Action, addressing factors causing spillover, covers wildlife trade, food production and distribution, traditional markets, land-use changes, biodiversity, animal production and trade, human action, biosafety, and biosecurity, and any other relevant environmental issues, including climate change.

**The FAO** has implemented a Field Training Program on Wildlife, Ecosystems, Biodiversity, and the Environment to address the gap in engagement of the environment sector in One Health by expanding access to One Health training for environmental professionals in government service. Training provided supports their ability to engage in integrated policy, programming and interoperable collaboration among sectors in the One Health context.

The United Nations Office on Drugs and Crime (UNODC) "Safety across Asia For the global Environment" (SAFE) program, funded by the European Union, supports the One Health approach by examining a wide variety of wildlife facilities exposed to potential illegalities with a view to identify risk factors of zoonotic disease transmission. The program is being piloted in Thailand, Lao PDR, and Vietnam. Once the wildlife facility assessments are completed, project SAFE will support institutions and counterparts to better respond to weaknesses and illegalities along the wildlife supply chain to prevent the spread of zoonotic diseases. UNODC's main implementation partners for this program are UNEP and FAO. Overall, UNODC's work is inherently interdisciplinary and interagency in nature, and recognizes the importance of and promotes collective approaches to combating wildlife trafficking.

**The World Bank** is active in One Health in China and in the ASEAN region, with a specialist based in Singapore. It estimates that an annual investment of between \$1.9-3.4 billion is required to build and operate systems for effective disease prevention and control. In China, the World Bank is working to support the enforcement of the government's 2020 ban on wildlife consumption. The \$1.5 billion One Health investment there focuses on livestock and agriculture and on strategic preparedness in two provinces. It is not clear if ASEAN as a region can look to the World Bank for leadership on ecosystem health, but the World Bank can be expected to play a major role in addressing economic drivers.

## NGOS

Several leading international NGOs are active in the Lower Mekong Subregion ecosystem management. These include the **Worldwide Fund for Nature, WCS, IUCN, and TRAFFIC**. All have been active in combating the illegal wildlife trade and other aspects of wildlife crime. WCS stands out for its technical expertise in One Health, which is unsurprising given that it convened the conference that produced the Manhattan Principles in 2004 and co-sponsored the conference that produced the Berlin Principles update in 2020. WCS has been a major driver of the One Health approach and can be considered a principal source of expertise on the ecological dimensions of One Health.

Regionally, the **Center for People and Forests (RECOFTC)** has worked for more than thirty years to advance a long-term, landscape-based, and inclusive approach to community-managed forests. It brings expertise in land and resource rights, sustainable livelihoods, prevention of deforestation, and promotion of gender equity in forest management. RECOFTC could be well-positioned to advance a community-based approach with IP and FRC that can be joined to the One Health approach in ASEAN.

The **Freeland Foundation** has long been active in combating wildlife trafficking. It founded and has been active in the **EndPandemics** coalition, which seeks to end pandemics through a roadmap that addresses habitat destruction, trade in wild animals, and promotes prevention through policy initiatives and awareness. The EndPandemics coalition calls for a ban on commercial trade in wild animals and a transition from industrial agriculture to agroecology. While not explicitly invoking One Health as a featured solution, its aims are consistent with the One Health approach and can play an important role, for example in engaging the private sector and in promoting policies.

**The EcoHealth Alliance** is a US-headquartered global environmental health non-profit organization dedicated to protecting wildlife and public health from the emergence of disease. EcoHealth Alliance's Emerging Infectious Diseases Southeast Asia Research Collaboration Hub is a collaboration among scientists in emerging disease research in the USA, Thailand, Singapore, and Malaysia. The network encompasses more than 50 clinics, laboratories, and research institutes across Southeast Asian countries working to better understand and respond to the risk of zoonotic viral emergence in Southeast Asia. This network is a valuable resource for understanding the dynamics of emerging infectious disease and the linkages with environmental degradation.

**SEAOHUN** is a foundation based in Thailand that comprises a network of universities in the ASEAN region. This network, which consists of more than 95 universities, was established in 2011 with support from USAID. USAID continues to support SEAOHUN through its OHW-NG and STOP Spillover programs. SEAOHUN's mission is to minimize the impact of infectious disease threats by developing the region's One Health workforce through education, research, and training through member universities. SEAOHUN also supports national One Health University Networks in Cambodia, Indonesia, Lao PDR, Myanmar, Malaysia, Philippines, Thailand, and Vietnam. SEAOHUN's Engaging International Organizations program promotes collaboration across regional networks to incubate collaboration on One Health topics.

Several national NGOs engage in public education campaigns, work to rehabilitate wildlife, and support law enforcement through crowd-sourcing information on illegal wildlife restaurants and other high-risk activities, especially in Vietnam, where **Save Vietnam's Wildlife** and **Education for Nature Vietnam** are active in curtailing poaching and wildlife trafficking, and wild meat consumption, respectively. To date, they do not appear to be engaged by the One Health community except through conservation NGOs.

**The Asia Foundation** has focused its program efforts on combating the public health implications and the economic and social issues exacerbated by the global COVID-19 pandemic. The Asia Foundation's country offices have long standing relationships with local partners. This has been important in identifying needs and mobilizing responses. The Asia Foundation has worked with partners, donors, and counterparts in government, civil society, and the private sector to repurpose existing programs and develop new initiatives to address immediate needs as well as the longer-term impacts of the pandemic, including urban inequality, implications for jobs in heavily impacted sectors such as tourism, in raising public awareness, and economic impacts such as spiraling national debt. It is not clear how this could translate into a long-term focus on underlying causes of pandemic risk, but because of the Foundation's deep commitment to civil society in the region, it should be engaged in the One Health process to the extent possible.

## PRIVATE SECTOR ACTORS

There is a sharp disconnect between the health institutions and the private sector regarding integration of One Health principles. For example, One Health is not incorporated explicitly in

Environmental and Social Governance (ESG) Principles, performance on which is reported through any of several different regional or global mechanisms. While spillover risk may be treated as *force majeure*, investment in high-risk activities such as land clearance would benefit from risk analysis, perhaps integrated with climate risk analysis. For example, One Health principles could be considered for incorporation into existing Environmental Impact Assessment or Social and Environmental Safeguard regimes or as part of an ESG commitment, such as the Equator Principles.<sup>44</sup> Several private sector actors are active in the EndPandemics campaign of the Freeland Foundation.

## PEOPLE'S REPUBLIC OF CHINA (PRC)

As an active trading partner and the major market for wildlife products, a major development cooperation partner, and as well as a major source of tourism, the PRC must be expected to be highly influential, both directly and indirectly, in the evolution of a One Health approach in the ASEAN region.

According to key informants, the PRC has taken decisive steps to eliminate corruption, closely tied to the demand for wildlife consumption. Dinners have included rare and expensive wildlife dishes as a means to curry favor from influential members of the Chinese government or others in positions of power. President Xi's anti-corruption drive has been a pivotal moment for containing IWV. Upon realizing that COVID-19 was a zoonotic disease probably introduced through wild meat, China stopped the wildlife trade and even updated the list of prohibited species to include not just CITES-listed species but common species formerly thought of as "pest" species. Promoting the wildlife protection law has changed behavior and garnered much support from the private sector. For example, if someone searches for a wildlife product on Baidu, the system will take note, and the next time, it will respond to a search from that user with a message discouraging wildlife consumption. As social media firms began excluding content marketing wildlife products, sellers have been working around restrictions by not using words but photographs and videos (especially on TikTok). Social media firms are now using artificial intelligence to identify and take down media being used to circumvent prohibitions on wildlife trafficking. The USAID Wildlife Asia project generated \$14 million in in-kind support from the Chinese private sector to combat wildlife trafficking.

According to interviewees, there has been a recent backlash to the consumption ban that has reached China's highest court. The court found that it was disproportionate for wildlife crime to incur greater penalties than human trafficking. They reclassified the definition of crime and changed the criminal code, largely around birds (songbirds featuring prominently in Chinese culture). Unfortunately, this opened loopholes for animal farms.

Chinese law enforcement has taken wildlife crime seriously in the past decade. With international NGO financial support, they have conducted joint training of port authorities in the ASEAN region – 2018 in Vietnam, for example. Large seizures followed each training and helped to generate greater information sharing. In Singapore, a seizure that made headlines was the result of a tip-off from the Chinese government. China has also supported/participated in the International Criminal Police Organization (INTERPOL)'s Operation Cobra 1 and 2. This experience has been very motivating for China's law enforcement personnel. China is now developing joint training programs with South American customs authorities focusing on illegal timber and wildlife. Similarly, UNODC and USAID Wildlife Asia collaborated on the delivery of two important workshops that aimed to 'look beyond the seizures and administrative sanctions and to focus on cooperative, multilateral investigations,

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<sup>44</sup> The Equator Principles is a risk management framework adopted by financial institutions, for determining, assessing and managing environmental and social risk in project finance.

apprehension, prosecution and conviction efforts.” They were designed to promote cross-border collaboration between China and Vietnam and were organized in July of 2019 in Hekou and Pingxiang, China.

No information was found about technical assistance from China, specifically on One Health to ASEAN. Still, China has embraced the concept and is developing One Health programs at provincial levels, including in two provinces, with support from the World Bank.



### **3 AREAS FOR FURTHER RESEARCH AND CONSIDERATION**

This section summarizes knowledge gaps and constraints affecting the advancement of a One Health program in the region. It is based upon the literature review and interviews conducted. It represents a potential research agenda for biodiversity and economic development oriented One Health approaches in ASEAN.

#### **3.1 KNOWLEDGE GAPS**

- What is the relationship between land and resource rights and risky behavior? Do secure land and resource rights incentivize risk-averse behavior?
- What are the appropriate cultural touchstones for One Health in the region? Can communication about One Health's benefit be supported through the cultural heritage of Member States, e.g., literature and music, folklore, etc.? If so, how can this be leveraged through partnerships with customary and indigenous communities and other groups, such as civil society organizations and academia focused on culture?

#### **3.2 POLICY GAPS**

- What are the potential returns on investment from an operational One Health program in ASEAN? Can cost-benefit analysis be adapted for a more precise valuation of One Health interventions in terms of benefits to the economy from reduced health risks and improved environmental protection? Can the valuation of ecosystem services in terms of managing zoonotic spillover risk be articulated?
- How can the concept of self-reliance, a major theme of ASEAN, be used to advance One Health (and vice versa)?

#### **3.3 FUNDING GAPS**

- How much will a One Health system cost?
- How much will a failure to prevent and control zoonotic spillover cost?
- Can the region afford (or not afford) One Health? In other words, what is the cost of inaction?
- What savings to countries might occur through an integrated approach? Can scale efficiencies be quantified, e.g., through regional cooperation?
- What current policies and practices incentivize risk (e.g., subsidies, reduced regulation for foreign direct investment)?
- Would there be efficiencies through a pooled multi-donor fund to support the One Health transition?

#### **3.4 ENGAGEMENT GAPS**

- How does the One Health agenda intersect with gender and indigenous peoples' communities?
- Are behavioral risks associated with a particular gender or social group, such as indigenous peoples or migrants?
- Are there gaps in gender-appropriate communication about health in the context of spillover risk?

- What is the potential role of the private sector? Can One Health principles be integrated into ESG approaches? (This would be an important innovation in elaborating a context-relevant approach to ESG and does not appear to be in place elsewhere).
- Given the costs of COVID-19, how does the risk of additional spillover events inform decisions on the part of investors?

## 4 POTENTIAL POINTS OF ENTRY FOR USAID

**High-level policy engagement on One Health approaches.** A weakness identified is the lack of champions for One Health at high levels in the ASEAN region, and a general lack of awareness of the critical linkages between health, environment, and economy. USAID may leverage the assets of the US government in a partnership with ASEAN to co-convene and deliver “exclusive” high-level briefings for senior government and ASEAN officials in the target area. US government contributions to such a delegation could include senior scientists in academia, public health officials such as the Centers for Disease Control leadership, the Chief Medical Advisor to the President, senior diplomats, and senior Treasury officials.

**Leverage existing USAID programs.** The One Health approach overlaps with and benefits from support from various USAID programs, including, *among other things*, biodiversity, protected areas, and resilient landscapes programming, applied science programs including SERVIR-Mekong and PREDICT 2, and the global climate change program. Existing health programs that can be leveraged include:

- OHW-NG, the workforce development program for One Health supporting SEAOHUN. USAID can build on the support for SEAOHUN to produce accessible policy briefs for decision-makers, visual data for quick reference, video, webinars, and social media content. There is also potential to expand its reach to related disciplines, in particular, engagement with the private sector and markets.
- STOP Spillover, the consortium working to advance understanding of the risk factors that contribute to viral spillover, implementing interventions at spillover points to prevent zoonotic disease, and assessing risk reduction practices and policies. STOP Spillover works in Cambodia to identify priority spillover interfaces and zoonotic viral pathogens.
- Discovery and Exploration of Emerging Pathogens – Viral Zoonoses (DEEP VZN), working to strengthen global capacity to detect and understand the risk of viral spillover from wildlife to humans. DEEP VZN will scale up USAID’s efforts to understand where, when, and how viral spillovers occur. SEAOHUN can potentially help USAID to address knowledge and capacity gaps, and to engage natural resource management and conservation networks in the region.

USAID’s economic growth expertise can support the integration of One Health principles in a diverse suite of economic activities, including supply chain logistics and transportation, agriculture, livestock, health, climate adaptation, and food security. USAID’s expertise in the valuation of ecosystem services can contribute to efforts to quantify the value of healthy ecosystems in containing spillover risk. USAID can engage a wide range of private sector actors in integrating One Health principles, for example, agriculture, travel and tourism, pharmaceuticals, insurance, and investments.

## 5 RECOMMENDATIONS

These recommendations are specific to the RDMA and its regional mandate. Country-level pilots are indicated for bi-lateral Missions where appropriate.

### **RECOMMENDATION 1: PLACE BIODIVERSITY AND CLIMATE CHANGE FRONT AND CENTER IN ONE HEALTH**

The key message of One Health is that protecting human health and preventing zoonotic spillover requires protecting planetary boundaries. One Health offers a framework for addressing the complexities of health on a changing planet. Sectoral approaches are not able to take advantage of this framework.

If RDMA embraces the concept of One Health in ASEAN, it should be with an understanding that One Health is a system to promote social and ecological resilience, e.g., under a rubric of One Health – One Planet. This may require some adjustment to existing One Health programming to facilitate better integration, including within RDMA.

### **RECOMMENDATION 2. PLAY TO USAID’S STRENGTHS**

RDMA should play to its strengths in biodiversity conservation, public health, economic growth, and climate adaptation to create a mutually supporting framework – healthy economy + healthy environment = resilient society. USAID’s investments in the Lower Mekong subregion, including landscape-level conservation, protected area support, knowledge management and access to data (SERVIR Mekong), countering wildlife trafficking, and the series of investments in emerging pandemic threats, including the PREDICT, PREVENT, IDENTIFY, RESPOND, STOP Spillover, OHW-NG, and DEEP VZN. The One Health University Network provides a solid basis for integrated biodiversity, public health, and economic growth programs. USAID’s investments in CWT have demonstrated that integrated approaches can work in ASEAN. USAID can apply that experience to build and support practical, operational One Health systems, including integrating health, climate risk management, and food systems.

### **RECOMMENDATION 3: DEVELOP THE ECONOMIC CASE FOR ONE HEALTH**

RDMA can help to quantify the benefits of healthy ecosystems for a resilient society, drawing upon USAID’s extensive experience in the economic valuation of ecosystem services around the world.

A major concern raised in this research is that One Health must not be a flash in the pan, to be gradually forgotten in the return to business as usual as the economic recovery from COVID-19 takes hold. To be transformative, One Health requires systems change, including new ways of thinking about our relationship with economy and environment, how we hold ourselves accountable, and how we think about risk. To do so will require widening the circle of engagement to address the gaps noted in this report.

### **RECOMMENDATION 4: CULTIVATE LEADERSHIP AT THE TOP, AND SUPPORT IT WITH CLEAR ONE HEALTH MESSAGES**

Through RDMA, high-level engagement will help senior decision-makers in political, governmental, and economic institutions to appreciate the costs of pandemics and the value of an integrated One Health approach. This should be continued and intensified, possibly through a series of “exclusive” opportunities to engage with luminaries in intimate settings (Dr. Anthony Fauci, Chief Medical

Advisor to the President, for example). At the very least, recognition that convening heads of state at the ASEAN-level merits a proportional show of recognition by senior-level US and European Union officials (the USAID Administrator or the Under-Secretary for Asia would convey US commitment). The optics of high-level cooperation on One Health may also offer a secondary benefit in providing an opportunity to positively engage the PRC on an issue of common concern, as well as countering Chinese narratives that downplay the expert consensus that the pandemic originated in Wuhan.

Leadership development is essential at all levels, especially at the community level, where many behavioral factors are linked to spillover risk. Targeted awareness building and skills training for emerging leaders in civil society groups and rural communities is also required.

Leadership should be supported by clear, unambiguous messages driven by both national governments and ASEAN that convey that a healthy economy plus a healthy environment equals a resilient society.

### **RECOMMENDATION 5: INVEST IN THE EMERGING GENERATION OF LEADERS**

The emerging generation of young professionals in the allied health fields, agricultural development, environment, and markets are more flexible and creative in their thinking than more senior, entrenched experts. They need to be empowered and supported as the next generation of leaders. An RDMA supported competitive small grants program to support innovation and research, opportunities for travel, short-term “externships,” and mentoring are ways that young professionals can be engaged and empowered to drive the One Health agenda. Here, FAO’s work to train biodiversity professionals in zoonotic disease surveillance provides one opportunity for leverage. Likewise, SEAOHUN or the Young Southeast Asian Leaders Initiative could expand its reach from students to early career professionals, and develop programs to engage other relevant actors, such as the finance and investment community.

### **RECOMMENDATION 6: DEVELOP A COMMUNITY-BASED ONE HEALTH SYSTEM IN AND WITH ASEAN**

RDMA in partnership with bi-lateral Missions can be a leader in improving the engagement of communities at the front lines of zoonotic spillover risk in prevention, surveillance, monitoring, and rapid response, through the development of a context-relevant Community One Health program. This approach should be based upon best practices from global experience. It should be integrated with biodiversity conservation, sustainable livelihoods, health, and food security activities, especially those supported by USAID and the One Health infrastructure. With the support of USAID Missions in the Lower Mekong, this approach could be tested and adopted in national CDCs. Conservation organizations with a long-term front-line field presence can be considered essential allies here.

### **RECOMMENDATION 7: STRENGTHEN RISK MANAGEMENT CAPABILITIES**

Predictive risk management is highly desirable, albeit challenging, both from a cultural and a practical standpoint. RDMA in collaboration with bi-lateral Missions can co-support this by building the evidence base through continued investments in basic conservation biology science - taxonomic inventories, monitoring, and modeling the health of species and ecosystems. It is also necessary to broaden the focus beyond a subset of CITES-listed species to include a wider range of species of

interest, as well as paying more attention to ecosystem integrity concerns that can affect zoonotic spillover risk.

In the near term, a focus on risky human behaviors is liable to yield the fastest results in preventing spillovers. These risky behaviors require additional scrutiny and improved safety standards. The prioritization and sequencing of actions to systematically address risky behaviors is necessary and is context specific. Prioritization should be done through expert consultations at an appropriate scale. Certifications may be a solution, and a feasibility study of issues and options for certification may be helpful.

### **RECOMMENDATION 8: DEVELOP A FLEXIBLE MULTI-DONOR ONE HEALTH ACTION FUND TO HELP OPERATIONALIZE ONE HEALTH**

RDMA can engage multilateral, bilateral, and private donors to support the implementation of the One Health approach through judicious use of grant funding. The One Health Action Fund can support participatory research, training, and communication strategies, including ways to address the above recommendations, such as young professional engagement and Community One Health approaches.

## 6 CONCLUSION

The similarity with climate adaptation challenges in USAID programming is noteworthy. These include working at scale, addressing complexity, and reforming systems that are more responsive. It may be beneficial to consider what can be accomplished by integrating One Health and climate adaptation at a regional level.

Habib et al. (2022) argue that the One Health approach is an opportunity for countries to set themselves on a path to green growth in the post-COVID-19 world. As already noted, the Greater Mekong Subregion is a global hotspot for the transmission of emerging, re-emerging, and epidemic-prone diseases, including zoonoses. Food safety and security are a challenge in the region. Pollution, driven by industrial activities, mining, and agriculture, is also a growing threat. These stressors undermine social resilience and amplify the impacts of climate change. One Health can play a crucial role in creating a common language and shared purpose for the development sector. The challenge for ASEAN is supplanting short-term thinking with a long-term understanding of prosperity.

## ANNEX I. THE BERLIN PRINCIPLES

The seminal “Manhattan Principles” were reformulated as the “Berlin Principles” in 2019, at the One Planet, One Health, One Future conference convened in Berlin by the German Federal Foreign Office and the Wildlife Conservation Society (Gruetzmacher et al., 2021) The updated principles captured lessons from a decade and a half of massive change in planetary and social systems, reintegrating ecosystem health and integrity while also addressing current pressing issues, such as pathogen spillover, climate change, and antimicrobial resistance. The principles can be summarized as:

- Retain the essential health links between humans, wildlife, domesticated animals and plants, and all nature; and ensure the conservation and protection of biodiversity.
- Develop strong institutions that integrate understanding of human and animal health with the health of the environment and translate science into policy and practice.
- Combat the current climate crisis, which is creating new severe threats and exacerbating existing challenges.
- Recognize and take action to mitigate the impacts of resource use that alter ecosystems, decrease resilience, and exacerbate and spread disease emergence.
- Incorporate the complex interconnections through adaptive, holistic, and forward-looking approaches while accounting for harmful economic drivers,
- Integrate biodiversity conservation and human health and well-being when developing solutions for disease threats.
- Invest in the global human, livestock, wildlife, plant, and ecosystem health infrastructure and funding mechanisms for the protection of ecosystems, commensurate with the serious nature of the threat
- Improve coordination of responses among governments and non-governmental organizations, health, academia and other institutions, the private sector, and other stakeholders.
- Form participatory, collaborative relationships among governments, NGOs, Indigenous Peoples, and local communities while strengthening the public sector to meet the challenges of health and biodiversity conservation.
- Invest in educating and raising awareness and influencing policy processes to increase recognition that human health ultimately depends on ecosystem integrity and a healthy planet.



## ANNEX 2. LIST OF INFORMANTS

NAME	POSITION	INSTITUTION
Alice Hughes	Professor	University of Hong Kong
Amanda Fine	One Health Director	Wildlife Conservation Society
Christian Walzer	Executive Director of Health	Wildlife Conservation Society
Daniel Mira-Salama	Senior Environmental Specialist	The World Bank
Daniel Schar	Director, Infectious Disease	USAID RDMA
G K Bounheuang	DTRA	US Embassy, Vientiane
Grace Ge Gabriel	Vice President for Asia	IFAW
Hannah Fairbank	Senior Biodiversity Specialist	Global Environment Facility
Jaimie Reaser	Research Coordinator	Smithsonian Institution
Lee Xiong	Head of Office	IUCN Lao PDR Office
Lisa Farroway	IWT lead	World Bank
Megan Hill	Environment Protection Specialist	USAID
Nora de Guzman	Team Lead, SBCC	USAID RDW
Sue Lieberman	Vice President, International Policy	Wildlife Conservation Society
Vong Sok	Head, Environment Division	ASEAN
Vu Thi Quyen	Executive Director	Education for Nature Vietnam

## ANNEX 3. DATA COLLECTION INSTRUMENT

### Interview Guide

1. Prior and Informed Consent
2. Respondent information
3. General Understanding
  - a. What is your understanding of One Health? How would it apply to ASEAN?
  - b. To what extent is the concept of One Health understood within ASEAN?
  - c. How well are the conditions and drivers of emerging human pathogens/emerging infectious diseases/zoonoses understood, generally and within ASEAN?
  - d. What ASEAN pillar might be most supportive of a regional One Health approach?
4. Risk Assessment
  - a. What existing models for risk assessment could be considered for ASEAN?
  - b. What predictive models might be used for One Health in ASEAN?
5. Knowledge Management
  - a. What are the barriers to knowledge exchange in One Health? How do they apply to ASEAN?
  - b. Are there existing tools and platforms to support regional integration in ASEAN? If not, why not?
6. Policy and Governance
  - a. At the regional level, is One Health understood to be a priority for policymakers?
  - b. How can One Health integration at a regional level be used to improve environmental governance?
  - c. In your opinion, has COVID-19 increased the willingness among ASEAN members to take collective action on a One Health policy?
  - d. How likely is a regional One Health approach to be implemented at the national and local levels?
7. Wildlife and Biodiversity
  - a. What is the connection between health and ecosystem services? How is this reflected in ASEAN?
  - b. To what extent are health stakeholders engaged in developing biodiversity agendas in ASEAN?
  - c. What if any role might consumers play in advancing a One Health approach?
  - d. What ecological countermeasures have been or could be identified to prevent zoonotic spillover risk?
  - e. How are connections between climate change and health addressed in ASEAN? Is this a model that might work for One Health?
8. ASEAN Regional Integration Using One Health
  - a. What should be done to take One Health to scale in ASEAN?
  - b. What might be some benefits to a regional One Health policy? Do you see a downside/risks?
  - c. How might a locally-led regional One Health be funded?
  - d. What are examples of successful regional integration of One Health elsewhere? How would they be useful to ASEAN?
  - e. How might USAID add value, accelerate change, and maximize impactful outcomes?

- f. How might other donors complement these efforts?
- 9. Final question
  - a. If you had a magic wand and money was unlimited, what would you do today to end the wildlife trade?

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