Health-Biodiversity Nexus in Southeast Asia

An Analysis Framework to enable biodiversity/conservation projects to take a One Health Approach

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DISCLAIMER

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EXECUTIVE SUMMARY

This study into the Biodiversity-One Health nexus was commissioned by the Biodiversity Working Group from the GIZ's *Sector Network of Rural Development and Natural Resources in Asia and the Pacific* (SNRD AP).

It includes an overview of the biodiversity-health nexus in Southeast Asia, the development and application of an analysis framework to three selected projects, and recommendations for further work at the nexus in the region. The overall objective of the study is to explore ways to support biodiversity-related projects in identifying values and opportunities for integrating the One Health (OH) approach into their work or future project proposals, and to guide the SNRD AP Biodiversity WG to work at the nexus. The authors believe that the analysis framework is a key tool towards this objective; it will help the integration of One Health into biodiversity conservation and its operationalisation on the ground. The study results enable the SNRD AP Biodiversity WG to actively participate in the international debate on how to put OH into policy and practice and ensure biodiversity conservation and ecosystem integrity are integral parts of any '*Building Back Better*' approach in the aftermath of COVID-19.

One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems. It recognises that the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent. Before and especially since the start of the Covid-19 pandemic, an urgent call to action to implement One Health has been issued by scientists, the One Health Tripartite+ and numerous (non-)governmental organisations.

Loss of biodiversity is caused by several anthropogenic factors such as overexploitation of species to meet the demand for wildlife products, extracting industries and change in land use for purpose of agriculture or infrastructure. These changes generally cause the physical distance between humans, their livestock and wildlife populations to decrease. This increases the risk of spillover events of zoonotic pathogens from vertebrate animals to humans, potentially reaching pandemic proportions.

Southeast Asia is a biodiversity hotspot and at the same time one of the fastest developing regions in the world. Overpopulation, intensification of agriculture and other factors cause environmental degradation that makes the region an important risk area for the incubation of zoonotic diseases.

The importance of the OH approach is clear, however there is not necessarily a clear path for biodiversity related projects on how to implement One Health in their work. The aim of this study is to explore the biodiversity-health nexus and develop a framework to offer projects a uniform analysis tool to efficiently analyse where and how multi sectoral OH collaborations can be initiated.

A literature review and key informant interviews guided the development of the analysis framework. The framework is presented with specific terminology and consists of three parts; an assessment of OH principles applied in a project, identification of entry points to the biodiversity-health nexus to determine in which thematic areas the OH approach can be applied, and finally an assessment of measures which serves as a guideline on how a project can link its work to One Health. Additionally, the enabling conditions provide insight into what systems need to be in place in order to start a successful OH project.

The principles referred to in this framework have each been given a value in order to offer projects the opportunity to do a quick assessment of their OH potential. In order to obtain a minimal score, projects need to have the multi-sectoral principle applied. This means that if there is no existing collaboration between the human health, animal health and the environment sector, the framework does not allow a project to be classified as One Health.

Three projects selected from the biodiversity WG members were analysed through the framework. The key finding is that none of the projects currently qualify as true OH project, due to the multi-sectoral principle not being fully applied; each project lacks some form of collaboration with the human health sector. However, all projects show excellent potential to implement One Health in some form due to their work in gate entry areas and measures as defined by the framework.

The framework should be considered as a starting point for the transformative process in the future of adding a One Health component to biodiversity projects. A radical shift in thinking is required from all stakeholders involved and it is recommended to find a way to break down the process of implementing the One Health approach into manageable and feasible measurements. By doing this, small-scale actions and successes are likely to increase trust in the process and will pave the way for broader support for the implementation from the conservation community and donors. This will eventually lead to a reduction of operational costs due to the promotion of effective forms of collaborations.

Further research is recommended to better explore gate entries and opportunities to expand the biodiversity-health nexus. We suggest the establishment of a OH Community of Practice within the SNRD AP Biodiversity WG to serve as a learning and sharing platform where common strategies can be developed. Some form of capacity building of WG members as well as GIZ Head Office staff will help to maintain a long-term, uniform approach for the use and further development of the framework.

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ACRONYMS

ACB	ASEAN Centre for Biodiversity
AMR	Antimicrobial Resistance
AMS	ASEAN Member States
APMS	ASEAN Peatland Management Strategy
ASEAN	Association of Southeast Asia Nations
BIO	Conservation and sustainable use of biodiversity and ecosystem services of forests
BMU	*Bundesministeriums für Umwelt, Naturschutz und nukleare Sicherheit* German Federal Ministries for Environment, Nature Conservation and Nuclear Safety
BMZ	*Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung* German Federal Ministry for Economic Cooperation and Development
CSO	Civil Society Organisations
EEA	Environmental Education and Awareness
EID	Emerging Infectious Diseases
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FLEGT-VPA	Forest Law Enforcement, Governance, and Trade - Voluntary Partnership Agreement
GIZ	*Deutsche Gesellschaft für Internationale Zusammenarbeit* German Development Agency
HNN	Hin Nam No (National Park)
IEC	Information Education and Communication
IRD	*Institut de recherche pour le développement* Research Institute for Development
IUCN	International Union for Conservation of Nature
IWT	Illegal Wildlife Trade
KAP	Knowledge Attitude and Practice
Lao-WEN	Lao Wildlife Enforcement Network
MAF	(Laotian) Ministry of Agriculture and Forestry
MARD	(Vietnamese) Ministry of Agriculture and Rural Development
MOH	Ministry of Health
NbS	Nature-based Solutions
MONRE	Ministry of Natural Resources and Environment
NAPPs	National Action Plans for Peatlands
NTFP	Non-Timber Forest Products
ODA	Official Development Assistance
OH	One Health

OHHLEP	One Health High-Level Expert Panel
OHP	One Health Partnership
OIE	*Office International des Epizooties* World Organisation for Animal Health
ORS	Online Reporting System
PA	Protected Areas
PAF	(GIZ) Portfolio Analysis
PFES	Payment for Forest Environmental Services
PPTF	Pandemic Prevention Taskforce
ProFEB	Protection and Sustainable Use of Forest Ecosystems and Biodiversity
SEA	Southeast Asia
SMART	Spatial Monitoring and Reporting Tool
SMP	Sustainable Management of Peatlands
SNRD AP	Sector Network of Rural Development and Natural Resources in Asia and the Pacific
SUPA – C1	Sustainable use of Peatlands and Haze Mitigation in ASEAN – Component 1
UNEP	United Nations Environment Programme
VCMC	Village Co-Management Committee
VHV	Village Health Volunteers
VHW	Veterinary Health Workers
WCS	Wildlife Conservation Society
WG	Working Group
WHO	World Health Organisation

1. INTRODUCTION

The present document summarises results and recommendations of a study aimed at exploring the Biodiversity-One Health-Nexus in South-East Asia and the Pacific. The study was commissioned by the *Sector Network of Rural Development and Natural Resources in Asia and Pacific* (SNRD AP), an internal platform within the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) for learning, sharing sector-specific knowledge and networking of like-minded professionals in the field of natural resources and rural development. Its Biodiversity working group (WG) is engaging in a variety of issues related to biodiversity and nature conservation. The WG connects professionals in more than ten South and Southeast Asian countries, working on the conservation of biodiversity in a variety of ecosystems and contexts. The study was funded through an internal GIZ Innovation Fund grant to the SNRD -AP.

Before, and especially since the start of the COVID-19 pandemic, scientists have been vocal about the importance of adopting the One Health approach in policy making and promoting its operationalisation on all levels in order to mitigate spillovers of zoonotic diseases from wildlife to humans. The One Health approach allows for a better understanding of the links between biodiversity, health and disease (Romanelli, Cooper and de Souza Dias, 2014). One Health takes the entire system in which diseases can develop and spread into account and focuses on preventive measures to preserve health and to reduce risks (BMZ, 2021); its implementation is of the greatest importance in the current state of our world (Gruetzmacher *et al.*, 2021).

One Health recognises the linkages between human health, animal health and environmental health and promotes a collaborative, multisectoral and transdisciplinary approach to achieve optimal health and well-being outcomes (One Health Commission, 2021). It was first formally described by the Wildlife Conservation Society (WCS) in 2004 through the Manhattan Principles, when the 'One World, One Health' strategy was developed by world experts after the first international symposium on the subject. The Manhattan Principles consist of twelve recommendations for establishing a more holistic approach to 'preventing epidemic/epizootic disease and for maintaining ecosystem integrity for the benefit of humans, their domesticated animals, and the foundational biodiversity that supports us all.' (WCS, 2021c). In 2019, the principles were updated and published with an urgent One Health call to action for cooperative, multilateral and democratic engagement at all levels of society, in the Berlin Principles (Gruetzmacher *et al.*, 2021; WCS, 2021b).

Issues where the One Health approach is often applied are zoonoses, antimicrobial resistance (AMR), and food safety. An example is the current 2021-2024 GIZ *Global Project on Pandemic Prevention and Response: One Health*, commissioned by the German Federal Ministry of Economic Cooperation and Development. This project aims to improve cooperation between international, regional and national organisations and institutions by targeting four to six countries (including Cambodia and Vietnam in Southeast Asia) to implement One Health into their development strategy and ensure a targeted and long-term implementation of the approach. The project also promotes the use of the open-source application SORMAS (Surveillance, Outbreak Response Management and Analysis System) and aims to strengthen institutions of relevance, as well as to develop technical and specialist skills to operationalise the One Health (GIZ, 2021f).

Having worked together on issues at the human-animal-environmental health interface since the 1940s, the World Health Organisation (WHO), the International Organisation for Animal

Health (OIE) and the Food and Agriculture Organisation (FAO) started a formal cooperation in 2010 with the FAO/OIE/WHO Tripartite Concept Note, on the shared responsibilities to address health risks through multi-sectoral cooperation. In 2011 they identified three One Health topics; antimicrobial resistance, rabies, and zoonotic influenza to showcase the One Health approach (FAO, OIE and WHO, 2017).

The environmental component of One Health has been neglected for long, with limited attention given to biodiversity and conservation within the classic OH initiatives addressing zoonoses and AMR (Essack, 2018). In 2020, the United Nations Environment Programme (UNEP) was formally invited to join the Tripartite cooperation, to ensure that the environment is properly taken into consideration within One Health. In their latest publication *Making Peace with Nature*, UNEP stressed the necessity of implementing the One Health approach to minimize the future health risks from environmental decline (UNEP, 2021).

FAO, OIE, WHO and UNEP agreed to create a One Health High-Level Expert Panel (OHHLEP) in May 2021, which will provide policy relevant scientific assessment on the emergence of health crises arising from the human-animal-ecosystem interface, as well as research gaps; and guidance on the development of a long-term strategic approach to reduce the risk of zoonotic pandemics (WHO, 2021a).

In the current climate and global discourse focused on how to prevent the emergence of future pandemics, it becomes imperative to explore the biodiversity-health nexus and understand the role that healthy ecosystems could play in mitigating the emergence of new diseases. This study provides the SNRD AP Biodiversity WG with an innovative tool and recommendations to guide the integration of One Health into biodiversity conservation and support its operationalisation on the ground. The results enable the SNRD AP Biodiversity WG to actively participate in the international debate on how to put One Health into policy and practice and ensure biodiversity conservation and ecosystem integrity are integral parts of any 'Building Back Better' approach in the aftermath of COVID-19.

The document is structured in seven chapters. The *Introduction* provides the rationale of the study, and the *Objectives and Methods* describe how this was conducted. The overview of the *Biodiversity-Health nexus in Southeast Asia* follows, with a quick analysis of the main *Actors and Initiatives* working on One Health in the region. The core of the report is the *Analysis Framework*, innovative tool developed within the study to allow the scanning of biodiversity projects using a One Health lens and looking for entry points and thematic linkages to leverage the biodiversity-health nexus. The practical application of the framework is reported in the following chapter, where three projects within the Biodiversity WG are presented as *Case Studies*. Study limitations and recommendations for potentials of an actual engagement at the biodiversity-health nexus are summarised in the *Conclusions and outlook* chapter.

2. STUDY OBJECTIVE AND METHODS

Adopting and implementing a One Health approach can be a challenging operation, no matter how logical and necessary. For many biodiversity-related projects there might not seem to be an easy or clear direct link with One Health. A lack of familiarity with the concept and the insufficient understanding of opportunities on local, national, and global level may cause the approach to be dismissed or ignored in the project planning stages. There are plenty of

scientific publications available that describe the importance and added value of One Health. However, there is limited guidance on its operationalisation and only a few practical examples on how projects can integrate the approach in ongoing actions.

The study was commissioned with the objective of overcoming these challenges and offering a uniform assessment tool to enable biodiversity conservation projects to link their work with the OH approach. The analysis framework equips the SNRD AP Biodiversity WG with a simple tool to explore opportunities of collaboration and integrate a OH component during the planning for new and existing projects.

The study was carried out by two consultants, a Public Health expert with long experience in the operationalisation of One Health among hard-to-reach communities in East Africa, and a conservationist who has been working on illegal wildlife trade issues in Southeast Asia for the past several years. The collaboration among the two consultants allowed approaching the aim of the study with a One Health perspective and provided for significant dialogues across disciplines. This opened up the opportunity for a continuous interchange on the validity and feasibility of entry points and thematic linkages that turned out to be pivotal in the development of the analysis framework.

The analysis of the literature provided a deeper understanding of the impacts of biodiversity loss and ecosystem degradation on the health and wellbeing of humans and animals. It gave insight into the value of collaborations at the biodiversity-health nexus and supported the identification of stakeholders and initiatives already engaged in the operationalisation of One Health. The biodiversity-health nexus in Southeast Asia was further explored through interviews with key informants from the research, development and conservation fields that contributed to recognising thematic areas and entry points for biodiversity interventions to integrate the OH approach.

The literature review and key informant interviews guided the development of the analysis framework. Three documents were critical in the process, enabling the design of the structure (three-step flowchart) and the identification and definition of key elements (principles, gate entries and measures) of the framework.

The OHHLEP's Definition of One Health helped to identify and determine the definition of the principles guiding the application of the OH approach.

> *One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems.*
>
> *It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent.*
>
> *The approach mobilizes multiple sectors, disciplines and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems, while addressing the collective need for clean water, energy and air, safe and nutritious food, taking action on climate change, and contributing to sustainable development* (WHO, 2021b).

The framework highlights the equity between sectors, the collaboration among different actors and between modern and traditional forms of knowledge, and the engagement of communities and marginalised voices, by giving a stronger value to the multi-sectoral, transdisciplinary, and participation principles respectively. Building on the OHHLEP's

definition, the multi-sectoral principle is defined as the collaboration and involvement of at least the public health-, the animal health-, and the environmental sector.

The *Guidance on Integrating Biodiversity Considerations into One Health Approaches*, issued in 2017 by WHO and UNEP (WHO and UNEP, 2017) and aimed at extending the application of One Health beyond infectious diseases, antimicrobial resistance, and food safety, was reviewed to better define the guiding principles of the integration of One Health into biodiversity interventions and to identify the key measures and enabling conditions required to its practical application.

Education, capacity building and communication are identified as critical measures to enable policy makers, practitioners, and communities to embrace a more holistic approach and to support the integration of biodiversity in the development of One Health policies, plans, programs, and research.

The GIZ Portfolio Analysis (PAF) (Gade, 2021) was consulted to refine the design and structure of the analysis framework. The PAF provided an overview of the GIZ portfolio, assessing over 400 projects in the thematic areas of environmental, human and animal health and categorising them as Potential, Active, Passive or Not OH interventions. The categorisation was done by reading project documents, analysing indicators, outcomes, and processes, and valuing them when referring to more than one sector. The PAF has a different scope from the current study; it aims primarily at labelling the projects in well-defined categories, to describe the GIZ portfolio in respect of the OH approach. Conversely, the framework presented in this report focuses on biodiversity-related projects and goes deeper into the analysis process, giving practical examples on where and how the links with One Health can be made. The two frameworks are complementary and can build on each other to foster the integration of One Health in the planning of new and existing projects.

The analysis framework was tested on three projects selected among the SNRD AP Biodiversity WG members. The exercise allowed appreciating the value of the newly developed tool and served as a stimulus for the debate on the biodiversity-health nexus and the potentials for integration of the One Health approach in existing initiatives within the SNRD AP Biodiversity WG. The three projects were assessed through the review of several documents, including the project narrative, technical and activity reports as well as documents that summarised the project outcomes and provided an overview of the project context. Meetings with the project owners allowed to clarify specific issues regarding implementation and to jointly explore the opportunities of building or expanding the biodiversity-health nexus within the current set-up.

An online workshop was organised on 29 November 2021 to present the analysis framework and its application to the SNRD AP Biodiversity - and other interested working groups. This was attended by about 30 participants from different GIZ departments, groups and projects that share an interest in One Health and the biodiversity-health nexus. The workshop served to collect important feedback on the value of the newly developed framework and to develop few recommendations to promote a continued exchange on approaches, opportunities, and good practices on how to integrate the One Health in new and existing biodiversity projects. Discussions and reflections from the online workshop are integrated in this report.

3. THE BIODIVERSITY-ONE HEALTH NEXUS IN SOUTHEAST ASIA

3.1 Biodiversity Loss and Disease Emergence

Emerging infectious diseases are either completely new infections, or infections that have increased in incidence or severity, emerging in new geographic areas, or is an existing disease that has developed a new clinical pattern, or developed resistance to existing therapies (Sarma, 2017). More than 60% of known pathogens have their origins in wild animals (Taylor, Latham and Woolhouse, 2001) and are transmitted between wildlife, livestock, and people within rapidly changing environments (Allen *et al.*, 2017).

The biggest drivers of biodiversity decline are overexploitation, where species are being harvested at a faster rate than their populations can regrow, and a variety of agricultural practices, such as food production, livestock farming, tree cultivation (Maxwell *et al.*, 2016), extracting industries and other land concessions. The development of more, and better roads near protected areas leads to greater accessibility of nature and allows for easier logistics when it comes to extraction and trade of non-timber forest products (NTFPs), timber and wildlife, as well as for grazing livestock. Improved infrastructure near vast forested areas may also allow people easier and quicker access to core zones that may previously have been less disturbed.

Livestock encroachment into protected areas has been documented in many cases worldwide, such as Mongolia (Salvatori *et al.*, 2021) and China (Hull *et al.*, 2011), causing issues such as wildlife displacement in areas where livestock enter and increased risk of disease transmission. From a disease risk point of view, the wildlife-livestock interface happens mostly through indirect contact (Wiethoelter *et al.*, 2015), through vectors and shared resources (e.g., salt licks, water). Anthropogenic land use changes causing the physical distance between livestock and wildlife to decrease can therefore influence the dynamics of pathogen spreading at the interface (Bengis *et al*., 2004; Wiethoelter *et al*., 2015).

There are several ways zoonotic diseases can be transmitted from animals to humans (CDC, 2021):

- Vector borne - where a disease is spread after a bite from a mosquito or other insects who are carriers of pathogens
- Direct contact - bites, licks, or other contact with bodily fluids from infected animals, such as blood, urine, or mucus
- Indirect contact - contamination with germs from surface areas where animals live, or objects touched by infected animals, such as aquarium water or food bowls
- Food borne - transmission by eating or drinking unsafe food items such as raw or undercooked meat, or fruit and vegetables that have been contaminated by faecal material
- Air borne/water borne - contamination from ingestion of water that has been contaminated with faecal material, or inhalation of droplets carrying viral pathogens

The above anthropogenic causes for biodiversity decline, as well as wildlife farming and wet markets play a role in the increased risk of spillover events of zoonotic diseases from wildlife populations to humans.

It is important to note that biodiversity and healthy ecosystems do not only play a role in the prevention of disease transmission. Sustainable use of biodiversity is important to maintain the beneficial services that ecosystems provide to human health. Some examples of ecosystem services are food, clean water, clean air, climate regulation, cultural and spiritual values and disaster risk reduction. Degradation of ecosystems reduces the ability to provide these life-sustaining services, which negatively affects huma health and well-being (UNEP and WHO, 2015).

3.2 Southeast Asia, hotspot for disease emergence

Asia is an important region when it comes to risk of emerging infectious diseases, with an epicentre history of some important emerging infectious diseases like severe acute respiratory syndrome (SARS - first detected in 2002), avian influenza H5N1 (first detected in 1996) and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2, causing COVID-19, first detected in 2019).

With now a total of more than 30% of the human world population, Southeast Asia has been rapidly developing over the past decades. Demographic and socio-economic growth have increased the demand for food and thus the need to converse natural areas into agricultural land and an intensification and more geographically concentrated production of livestock (Horby, Pfeiffer and Oshitani, 2013). Asian countries combined keep the majority of pigs and poultry in the world (He *et al*., 2021).

Despite having brought many benefits, this rapid development has also contributed to widening health inequalities, environmental degradation, increased migration and urbanisation, and a concentration of persons, food production and economic activity, according to Horby, Pfeiffer and Oshitani (2013).

Culturally and traditionally, many Southeast Asian countries place high value on wildlife products for food, traditional medicine use, trophies, and live wild animals as pets. Wildlife farms have been operating for decades and are still legally operating in countries like China, Vietnam and Laos, despite controversies such as wildlife laundering and risks of creating spillover events of infectious diseases at the human-wildlife-livestock interface.

Allen *et al*. (2017) research into factors that influence the risk of emerging infectious diseases suggests that predicted risk is higher in tropical, developing countries. Their results point towards an elevated risk of disease emergence in tropical forest regions, high in mammalian biodiversity and subject to anthropogenic land use changes for agricultural purposes. From this perspective, it is clear that Southeast Asia is a key area to implement the One Health approach in biodiversity work.

One of the key messages of the 2020 *Biodiversity Outcome Statement* of the Global Landscapes Forum ‘One World, One Health’ digital symposium was the need to integrate One Health principles into the landscape approach (GLF, 2020).Four pathways for transformative change were identified and one of these, *Building Back Better*, places the One Health approach at the basis of this call for action. Experts called for a global strategy to combat future health threats, which must be centred on transdisciplinary and multisectoral alliances between policymakers, scientists, youth and grassroots organisations, local communities, and the private sector.

4. ACTORS AND INITIATIVES IN THE BIODIVERSITY-ONE HEALTH NEXUS

The study did not aim at providing a detailed and complete inventory of actors and initiatives working on One Health in Southeast Asia. However, an overview of key actors and initiatives was considered important to enable the identification and establishment of potential collaborations at the biodiversity-health nexus.

The list includes examples from the government, the research, and the development sector. The overview describes a dynamic environment that is slowly recognising the importance of the OH collaborative approach to the management of the human-animal-ecosystem interface at local, national, regional, and global level.

The Vietnam **One Health Partnership, OHP** (OHP, 2014) is one of the few government-led initiatives to focus on One Health in Southeast Asia. It was established with the main goal of preventing and controlling zoonoses but has recently expanded its scope to include the mitigation of spillover risks of pathogens, the control of antimicrobial resistance, and the management of environmental factors that impact health. The partnership includes concerned ministries, United Nations, international technical agencies, research institutions, and international and civil society actors. With its attention to institutional capacity and human resources, the OHP in Vietnam is a good example of the institutionalisation of One Health; it can pave the way for other countries in the region to recognise and fully adopt the OH approach to tackle the health threats at the human-animal-ecosystems interface.

The **Southeast Asia One Health University Network**, SEAOHUN (SEAOHUN, 2011) was established in 2011 with the main goal of developing a competent OH workforce. The regional network includes 92 universities across Southeast Asia, with well-established country networks in Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, and Vietnam. The regional and country networks are key partners in the education and capacity building of professionals who can eventually engage in cross-sectoral collaborative processes to design innovative interventions to harness the biodiversity-health nexus.

The Research Institute for Development (*Institut de Recherche pour le Développement*, IRD) has recently engaged in promoting and strengthening the adoption of One Health in Southeast Asia. The **OHSEA project** (IRD, 2021) aims at drafting a detailed inventory of actions and research initiatives in the environment-zoonoses field and increasing the capacities of students, professionals, and decision-makers on One Health. The project can be an excellent opportunity to deepen the knowledge of actors and initiatives at the biodiversity-health nexus and establish fruitful collaborations in the region.

The **Southeast Asia Lab Network**, SEALAB (SEALAB, 2021) is designed to respond better and faster to emerging human and zoonotic infectious disease outbreaks with pandemic potential. The network focus is the capacity strengthening of laboratories mainly working in the human and animal health sectors, with the potential for collaboration to improve the communication and exchange of data and information.

The **Preventing ZOonotic Disease Emergence**, PREZODE (PREZODE, 2021) is an international One Health initiative that intends to better understand the risks of zoonotic diseases emergence and to develop innovative methods to improve their prevention, early detection, and rapid response. In 2021, the initiative engaged in a co-design process of its strategic agenda and governance, in consultation with interested international, regional, and national stakeholders. The co-design process is expected to end at the beginning of 2022 and can still

be an opportunity to put the biodiversity-nexus on the agenda and promote the piloting of innovative initiatives in the Southeast Asia region.

As main promoters of the Manhattan Principles, WCS can be considered a key partner in One Health and its adoption at the biodiversity-health nexus. WCS adopts the OH approach to track and improve wildlife health, monitor and reduce the risk of emerging zoonoses, mitigate livestock disease transmission, build veterinary capacity, and catalyse global change (WCS, 2020). The organisation has lately engaged in a regional initiative to support the national governments in Cambodia, Lao PDR, and Vietnam in building and implementing national wildlife health surveillance strategies that can improve the rapid detection and response to emerging pathogens. The WildHealthNet project (WCS, 2021d) promotes the adoption of Smart for Health for the early identification and reporting of disease events in wildlife animals.

Several other actors and initiatives are adopting the OH approach in the region, with more and more of them gaining a particular interest in integrating One Health in biodiversity and conservation projects. A systematic analysis of the OH landscape in Southeast Asia can help the SNRD AP Biodiversity WG to harness new collaborations and gradually take a clear position in the management of the biodiversity-health nexus.

5. THE ANALYSIS FRAMEWORK

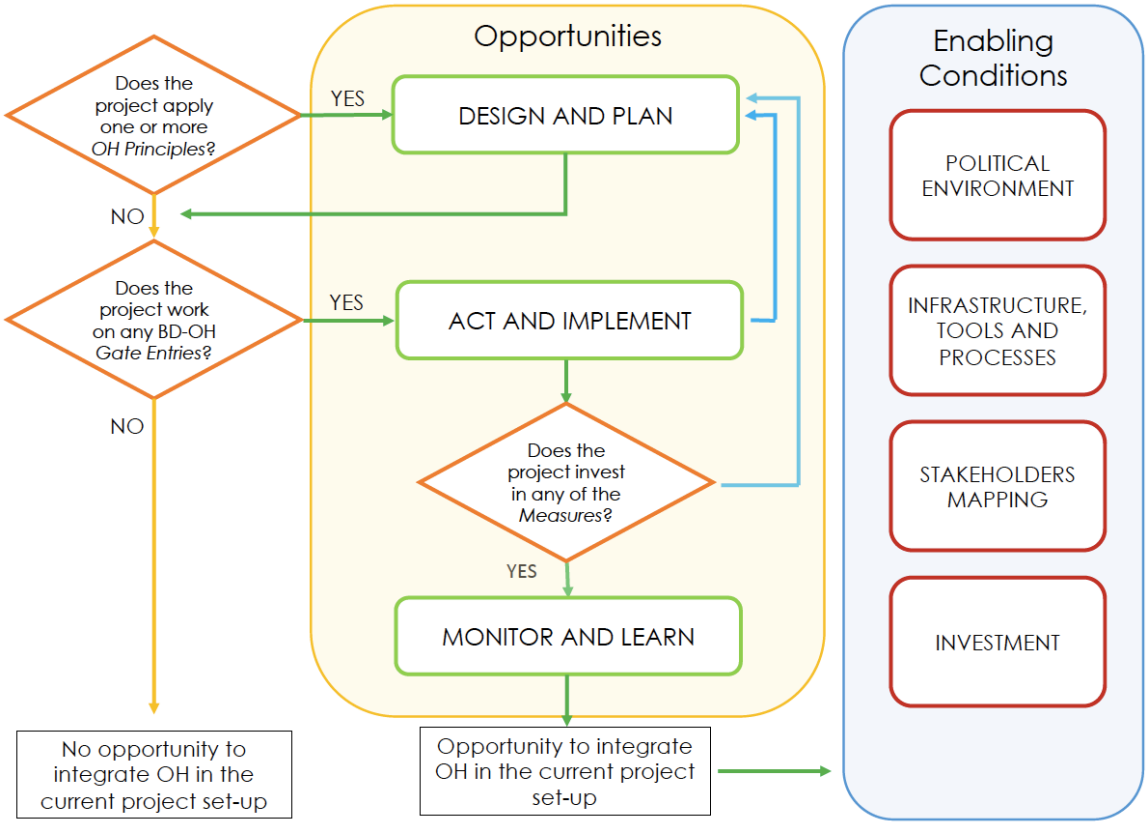
This analysis framework (see figure 1) was developed to assist the SNRD AP Biodiversity WG to implement the One Health approach within the biodiversity-related projects in the SEA region, either from the early planning stages, or during the course of already existing interventions. By systematically applying the framework in its different components, individual projects will be able to identify potential areas in which they can expand or amend their activities into One Health.

The framework analysis consists of three components:

1) Assessment of principles
2) Identification of gate entries
3) Evaluation of measures

This chapter offers an explanation of the different components, elements and values of the framework and how to use them to analyse projects in a practical way. The framework is accompanied by a simple Excel tool to ease its practical application to biodiversity projects (see Annex 1). The tool allows the rapid description of the project according to the OH principles; the identification of gate entries to the biodiversity-health nexus; and the pinpointing of measures already in place and to leverage for an effective integration of One Health. The tool includes a list of detailed definitions for the words and terminologies used in the framework, to ensure a standard application across projects and from different users.

Figure 1: The Analysis Framework to assess biodiversity project through a One Health perspective



The principles

The One Health principles used in this framework were identified and adapted from the Convention on Biological Diversity's *Guidance on Integrating Biodiversity Consideration into One Health Approaches* (2017) and a few definitions of One Health. In particular, the recent definition proposed by the OHHLEP and presented at the World Health Summit in October 2021 (WHO, 2021b) was taken as primary guidance to selecting the principles characterizing the One Health approach. The principles are the starting point of the framework analysis. They are crucial to assess a project through a One Health lens. For more comprehensive definitions of all principles see Annex 1.

Table 1: Definition and value of the OH principles within the Analysis Framework

Principle	Definition	Value
Multisectoral	Collaboration of multiple sectors - at least human health, animal health and the environmental sector, preferably including other sectors when appropriate	5
Transdisciplinary	Involvement of stakeholders of different levels - scientists, policy makers, authorities, NGOs and local communities	1

Participation	Maximised involvement of all stakeholders in all phases of the project, especially in the decision-making process	1
Prevention	Implementation of preventative plans and actions to mitigate risks to ecosystems, animals, plants and humans	0.5
Decentralisation	Decentralised management at the lowest appropriate level with engagement, ownership, responsibilities of local actors.	0.5
Evidence-based	Interventions informed by relevant and scientific evidence through thorough baseline and regular assessments	0.5
Multi-scalar	Actions are applied at local level, to gain evidence and inform their application at wider scale	0.5
	Total possible score	9

The first step of the analysis is to assess if the project is already applying, - or has a sufficient base for - the One Health approach. The question that needs to be asked is: *Does the project apply one or more OH principles within its scope of work?* If this is the case, it means that there are immediate opportunities to design and plan a One Health component within the project.

Note that not all principles in the framework have equal value. The first principle *Multisectoral* is considered an essential component in this framework analysis and if there is no existing collaboration between the human health-, the animal health- and the environment sectors within the project, the minimum application requirements are not met and therefore the project cannot be classified as OH project.

This does not mean that the One Health approach cannot be implemented, nor does it imply that the framework analysis has to stop here. The purpose of this initial assessment is merely to give insight into the project's current state. It will help to clarify what needs to be addressed in order to meet the minimum requirement and preferably what principles need to be explored and included in order to obtain the highest relevant score possible to successfully implement a One Health approach.

Table 2 gives insight into a project's current One Health implementation potential and can serve as a 'quick scan' to describe the project through its application of OH principles.

Table 2: Project description as per the application of OH principles

Total value of applied principles	Assessment outcome and implementation potential
7.5-9.0	Excellent application of One Health principles
5.5-7.0	Good application of One Health principles
5.0	Minimum application of One Health principle
0.0-4.5	Insufficient application of One Health principles

The gate entries

The *gate entry* for the purpose of this framework is a *thematic area* in which the project conducts activities or actions that have the potential to link into a One Health approach. The framework identifies five main key gate entries in the biodiversity-health nexus: Zoonoses and EID, Agriculture Production and Food Safety, Climate Change and Risk Reduction, Wildlife Trade and Consumption, and Biodiversity Conservation. As primary focus of the study, the latter was expanded into three different categories identified as critical gate entries within any biodiversity conservation intervention: Nature-Based Solutions (NbS), Protected Areas (PA), and Wildlife Management. As already mentioned for the OH principles, the definition of each gate entry is provided in Annex 1 to ensure a common understanding of them.

The second step of the analysis is to identify the potential 'gate entry points' where a One Health component can be implemented within the project. The question that needs to be asked is: *Does the project work on any biodiversity-health gate entries?* Since gate entries are areas where biodiversity projects can link their work into a One Health approach, they present real opportunities to integrate and transform project goals and One Health goals into a common goal. Common goals have increased value and add to a project's ability to achieve optimal and sustainable health outcomes for people, animals and ecosystems by collaborating with other sectors. If this is the case, it means that there are immediate opportunities to act and implement a One Health component within the project.

For example, project A conducts regular wildlife monitoring activities in a certain area and collects wild faecal samples for genetic analysis purposes. The individual goal of the project is to know the number of different individuals in a population of a certain species through DNA analysis and to track changes over time. However, if this project would take a One Health approach and collaborate with other sectors, the same samples could be analysed for other purposes like the detection of certain pathogens in the population. When this information is shared, it could inform scientists about diseases present in this particular population and give an indication of spillover risks to livestock or humans. Or pathogens found in wildlife could have been transmitted from livestock, indicating the need to vaccinate livestock close to where the wild species is found to prevent decline of the wildlife populations in that area.

The measures

Once it has been identified how (*principles*) and where (*gate entries*) the One Health approach can be implemented by a project, it is necessary to make sure that the integration is operationalised in an optimal and relevant way. The measures proposed in this framework give insight into ways through which this can be achieved.

For a more comprehensive list of definitions of these measures, see Annex 1.

Table 3: Definition of the measures within the Analysis Framework

Measure	Definition
Education and Awareness	Education: any method of transferring or gaining knowledge. Awareness: a process that influences attitudes, behaviours, and beliefs

Policy Development	Designing and producing strategic plans and policies
Capacity Development	To improve capability in people and or organisations
Collaborative Platform	Group of individuals with different backgrounds, experience and expertise that work towards a common goal
Community Engagement	Involvement of local communities in decision making processes
Information Sharing	Exchange of data and information between stakeholders
Surveillance and Early Warning	Collection and sharing health related data to support early detection of acute health events
Research	Research at the intersections of human-, animal- and environmental health

The third step of the analysis is to assess if the project is already implementing specific measures that will allow building a One Health component and integrating it into the project. The question that needs to be asked is: *Does the project invest in any of the Measures?* If this is the case, it means that there are immediate opportunities to integrate One Health in the current project and to monitor and learn from practices that can eventually be replicated at larger scale and inform the development of policies.

The enabling conditions

The final part of the analysis framework is to verify that the *enabling conditions* are met in order to truly implement the One Health component. These include a conducive political environment that encourages government and non-state actors to willingly collaborate; infrastructure, tools and processes that ease the sharing of data and enable the co-design of multi-sectoral transdisciplinary interventions at the human-animal-environment interface; a detailed stakeholder mapping that allows the identification of strengths and potentials across different actors and promotes the establishment of valuable collaboration; and a meaningful investment that sustain the application of the One Health approach in new or existing project. Just like with the *principles* at the start of the framework analysis, not meeting the enabling conditions does not automatically disqualify a project to take a One Health approach. However, the impossibility to meet these conditions may hinder the actual operationalisation of the approach on the ground. The conditions are integrated into this framework to give clear insight into what needs to be in place to create an optimal environment for sustainable and optimal collaborations and activities.

For example, project B has been analysed through the framework and it shows that the principles are applied and that it is possible to implement One Health measures in several gate entry areas. However, project B has always been quite a stand-alone project with regular staff turnover and therefore it is currently unclear which stakeholders are available to start collaborations with. In this case a stakeholder mapping exercise is needed, so that optimal and relevant collaborations can be started, and common goals can be defined.

6. CASE STUDIES

This chapter summarises the outcomes of the application of the analysis framework on three projects within the SNRD AP Biodiversity WG, providing some practical examples to integrate the One Health approach in the ongoing activities. The projects are described with reference to the OH principles; possible gate entries and measures are identified to guide where and how the One Health approach can be applied. Opportunities of collaboration with other actors and initiatives are explored within the local context of each project. Due to time restraints the analysis of projects was limited to a desk review of documents and one or more clarifying meetings with project owners. More conversations with project teams and additionally with key stakeholders are needed to do a more thorough analysis and obtain a full picture of the project.

The assessment is a first attempt to promote the integration of One Health in already existing biodiversity projects. Each project team should engage in a thorough revision of the identified opportunities to assess the feasibility of their implementation and their consistency with strategic plans and programs at the national and regional level.

6.1 The ProFEB project in Laos

The Protection and Sustainable Use of Forest Ecosystems and Biodiversity (ProFEB) is a three-year (2021-2024) project commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ). The project aims at improving the regulatory and institutional framework for the conservation and sustainable use of forest and biodiversity in Laos, promoting inclusive multi-stakeholder processes that involve state authorities, civil-society organisations, academic institutions, and the private sector. The area of intervention includes Khammouane Province, Attapeu Province, and Vientiane Capital. The Ministry of Agriculture and Forestry (MAF) is the lead executing agency, though other ministries and related departments are involved including the Ministry of Natural Resources and Environment (MoNRE) and the Ministry of Information, Culture and Tourism (MICT) (GIZ, 2020b).

The project has **four outputs** (GIZ, 2021h):

- Setting up the legal-institutional framework for the implementation of the Forest Law Enforcement, Governance, and Trade-Voluntary Partnership Agreement (FLEGT-VPA) between Laos and the EU
- Strengthening the institutional and technical capacities for the transboundary World Heritage nomination of Hin Nam No National Park of Laos in partnership with the Vietnamese authorities
- Supporting the establishment of the Environmental Education and Awareness Laos (EEAL) Alliance and developing the professional capacities for carrying out effective environmental education and awareness measures of its members
- Improving the cooperation between the Lao Government, ODA partners and local people to effectively combat illegal wildlife trade

In agreement with the project team, the assessment was limited to the last three outputs due to time constraints and the complexity of the FLEGT-VPA component. These were scanned

through the three steps of the analysis framework to assess the application of the OH principles, to identify the gate entries to the biodiversity-health nexus, and to recognise the measures already in place to allow the integration of the OH approach.

The ProFEB project cannot be defined as OH project, as it lacks the multisectoral principle – recognised as the minimum requirement to describe the intervention as One Health. However, the project applies all the other OH principles and has therefore a high potential to integrate the One Health approach in its implementation. The project works at two gate entries that can allow embracing a more holistic One Health approach, Wildlife trade and Consumption and Biodiversity Conservation; in particular, the co-management of Hin Nam No National Park represents a key entry point to the biodiversity-health nexus. There are at least six measures that are already implemented within the project and that allow the integration of One Health. Table 4 summarises the outcomes of the analysis of the ProFEB project through the framework, with reference to specific documents that were reviewed and analysed during the process.

Table 4: Analysis of ProFEB project through the framework

Framework step	Project analysis
OH PRINCIPLES ☑	The project is **not multi-sectoral**. Despite the involvement of partners coming from different disciplines (Agriculture, Tourism, Environment and Natural Resources), the project does not engage with the health sector in any of the implemented activities. As per the framework definition, the project cannot be defined as multi-sectoral (GIZ, 2020b).
	It is **transdisciplinary**. There is a close integration between local authorities, local communities, civil-society organisations, and research institutions across the different project activities (EEA Laos, 2020; GIZ, 2020b; Erbe, 2021).
	It is **participatory**. All project stakeholders take part in the different decision-making processes. Of relevance, the *Collaborative Management System for HNN National Park* that, despite few challenges, foresees the involvement of local communities in defining the content and structures of the plans and bylaws, and the coordination of local communities, private sector, government and CSOs in their application (GIZ, 2021a).
	It has a special focus on **prevention**. The program aims at ensuring an effective, equitable and sustainable management of natural resources for the benefit of the entire population of Laos, in particular rural and poor communities and their natural environment (GIZ, 2020b).
	It is **decentralised**. Khammouane Province is appointed with the responsibility of the management of HNN National Park and all procedures for its Transboundary World Heritage Nomination. Concerned departments at district level and Committees at village level are also involved in the process (GIZ, 2020a).
	It is **evidence-based**. Surveys and baseline studies were conducted to plan the action based on the local needs. Of note, the KAP surveys to assess trends and changes in the community environmental knowledge and better plan the EEA activities (EEA Laos, 2020).

	It is **multi-scalar**. The project plans to use the lessons learned from participatory schemes tested in HNN National Park for curbing the wildlife trade to shape the Natural Resource Conservation policies at national level (GIZ, 2020b).
GATE ENTRIES 	There are at least 2 gate entries to the biodiversity-health nexus, Wildlife Trade and Consumption and Biodiversity Conservation. Within the latter, Protected Areas (HNN National Park) is the key gate entry of the project.
MEASURES 	The project applies at least 6 measures that can support the integration of the OH approach (Education and Awareness, Policy Development, Capacity Development, Collaborative Platform, Community Engagement, and Information Sharing). It does not engage in surveillance and research measures that, as per the framework definitions, must refer to the One Health domain (i.e., the detection of public health threats and the research at the human-animal-environment interface).

The analysis of the ProFEB project through the framework identified clear potentials for the expansion of the biodiversity-health nexus and the integration of One Health into the ongoing activities. The three outputs that were analysed were 'unpacked' and individually reviewed to be able to identify entry points to the nexus. As mentioned before, entry points are thematic work areas in which a project team and stakeholders can co-design and plan new activities and interventions that embrace a more holistic approach to foster the health of humans, animals, and the ecosystem. The common denominator across the three outputs of the ProFEB project is the need to expand the project governance to include the health sector. This does not imply that the Ministry of Health must become a key partner of the intervention; rather, the Ministry of Health or any of its concerned departments can be called in to participate in the collaborative process to the development of the OH activities. Collaborations can be achieved at different levels, by signing specific agreements at the national or provincial level or just by involving the health departments, officers, and service providers at the local level, where project implementation takes place. Refer to table 5 for details of the potentials of intervention at the biodiversity-health nexus.

Table 5: Potentials for interventions at the biodiversity-health nexus within the ProFEB project

Gate entries and Measures	Entry points and potentials for interventions
OP2: HIN NAM NO (HNN) NATIONAL PARK	
 Protected Areas  Policy Development Capacity Development Community Engagement	**a) Co-management of the Protected Area (PA)** As criteria of the IUCN Green List of Protected and Conserved Areas (IUCN, 2017), the co-management of HNN National Park is a key entry point to the nexus. Management plans can be revised to accommodate an expansion of the key stakeholders involved in the decision-making processes. • The Village Co-Management Committee (VCMC) can develop into Multi-Stakeholder Platforms (Homann-Kee Tui *et al.*, 2013), spaces for learning and change that involve individuals with different backgrounds and interests, but

	with a common vision and working together to achieve their goals. • Community-based health service providers, such as Village Health Volunteers (VHV) and Veterinary Health Workers (VHW), can be integrated into the VCMC. They will bring the voice and perspective from the health and veterinary field into the group, facilitating the discussion around health issues. • The staff involved in the PA management and all local committees can be trained on One Health (e.g., Principles and Concepts, Collaboration, Management and Leadership, Ecosystem, Behaviours Change, Communication).
	b) Improved livelihood in the buffer zones The project is already working on livelihood support activities in all buffer zones villages. These can mitigate the risk of encroachment, grazing and overexploitation of NTFPs, and help reconcile conservation and development. Livelihood can be an excellent entry point to the nexus, when expanded to include the health and well-being of local communities. The expansion of the nexus can be done by establishing/reinforcing the collaboration with other actors and stakeholders working on health and livelihood in the intervention area. • Livelihood projects can include activities specifically addressing the accessibility to health, ensuring that health facilities are adequately staffed and equipped. • Veterinary (preventive and curative) services within the buffer zones can be strengthened to improve livestock health and productivity, eventually improving the income and livelihood of villagers. • Education and awareness activities can be organised across the villages in the buffer zones addressing the key principles of One Health and the risk of disease emergence at the human-livestock-wildlife interface. • Community-based service providers (VHV and VHW) can be trained on One Health and engaged in outbreak investigations and disease surveillance activities in the buffer zones and the National Park.
	c) Xe Bang Fai Cave Several surveys were undertaken in Xe Bang Fai and other caves within HNN National Park, to describe the bat species population in the area. The surveys employed direct observation and capture of live animals, to allow species identification. Survey and monitoring missions of bat populations can be an entry point to the nexus, if expanded to include some pathogen surveillance activities. Xe Bang Fai Cave is also a tourist attraction and can be used as an entry point for education and awareness on One Health and

	the biodiversity-health nexus. See the EEA component below for further details.
	d) Wildlife trade within the park Despite being prohibited under the Wildlife and Aquatics Law (2007) in Laos, illegal hunting activities and subsequent (inter)national trade for consumption of wildlife species are relatively common, as enforcement of the law can be challenging. Wildlife trade and consumption is a key entry point to the nexus, especially considering the transboundary collaboration between HNN and Phong Nha – Kẻ Bàng National Park in Vietnam. Cross-border patrolling can be an opportunity to integrate OH activities, through wildlife disease surveillance. See the Wildlife Trade component below for further details.
OP3: ENVIRONMENTAL EDUCATION AND AWARENESS (EEA)	
 Biodiversity Conservation Wildlife trade and consumption  Education & Awareness Capacity Development Collaborative Platform	Education and awareness can be good entry points to the nexus. The EEA Alliance is an excellent platform to embrace a more holistic approach and build a One Health action within already existing activities. Expanding the nexus and integrating the OH approach can be done by: **a) Expanding the network to include new partners** Actors and stakeholders specialised in health can be involved in the network and engaged in the education activities at community level. The inclusion of health partners in the network will stimulate the dialogue around health issues; the adoption of the OH approach can enable the collaborative planning and design of education activities. Training of facilitators can include specific modules on the One Health concept and principles. When possible, facilitators should ideally come from different disciplines and sectors to foster collaborative learning and planning of education activities. **b) Enlarging the group of beneficiaries** Involving new partners in the EEA Alliance and training new facilitators can help reach a larger group of beneficiaries. When health and veterinary workers are trained to be OH facilitators, they can include environmental education in their routine health talks at health facility and village level. Health facilities and animal health posts become new entry points for EEA activities, enlarging the target audience. **c) Developing new IEC materials** The EEA Alliance benefits from an excellent collaborative platform where IEC materials are shared among partners. This can be used to rapidly scale the adoption of training manuals, posters, flyers and videos on One Health and the importance of a collaborative approach to biodiversity and conservation.

OP4: WILDLIFE TRADE	
 Wildlife trade and consumption  Education & Awareness Policy Development Capacity Development Collaborative Platform Information Sharing	This project output is still in a planning phase. The mapping of stakeholders and IWT initiatives in the country indicate that there is high potential for collaboration at the biodiversity-health nexus. The coordination with existing initiatives and the participation in different collaborative platforms are the main entry point to integrate the OH approach. **a) Engagement in law-enforcement activities** The Lao Wildlife Enforcement Network (Lao WEN) is an excellent entry point to the nexus. Lao WEN is a coordinating platform under the MAF, that includes several government departments and authorities appointed with the management and authority to respond to wildlife crime in the country (GIZ, 2021a). A OH Training Program for officers at different levels (national, provincial and district) can promote the understanding and appreciation of a more collaborative approach to combat illegal wildlife trade. The network can expand to include the Ministry of Health, in the management of specific cases that have a potential risk of disease spillover. **b) Engagement in advocacy activities** The Working Group 15.7 is a forum to support policy making on wildlife trade, it includes several embassies and international organisations, and aims at promoting change at the political level. Bringing One Health into the agenda of the WG can help promote a more collaborative approach to wildlife trade in high-level discussion fora at national level. In order to inform the shaping of policies, the WG 15.7 can support and finance specific research activities to identify the disease risks along the wildlife supply chain and trade. **c) Wildlife disease surveillance** The Spatial Monitoring and Reporting Tool (SMART) platform is a tool widely employed for the management and monitoring of PAs. WCS has enhanced SMART for the collection of wildlife health information, to support the early detection and response to wildlife disease events (WCS, 2021a). SMART for Health, currently piloted in Laos[1], is an excellent entry point to the nexus, if applied in the project area. Standard Operating Procedures for the surveillance of zoonotic diseases in traded wildlife are under development through a multi-stakeholder collaboration that include MAF, MONRE and MOH. A close coordination with these initiatives can help scaling the collaborative approach and expand the nexus in the project intervention area.

[1] Information shared during the Key Informant Interview with WCS Veterinary Technical Advisor for Wildlife Health Program in Laos (10 November 2021)

	d) Education and Awareness The Social Media Campaign on combating illegal wildlife trade is a ProFEB initiative addressing the demand side of wildlife trade. The Initiative is led by MAF and involves several local and international organisations. The Social Media Campaign is an excellent entry point to the nexus if health partners are also included in the discussion. Government and non-state actors involved in the health sector can support the assessment of needs and the development of messages, contributing to a more holistic approach to illegal wildlife trade and emphasising the health risk at the human-animal interface.

6.2 The BIO project in Vietnam

The *Conservation and sustainable use of biodiversity and ecosystem services of forests* (BIO project) is a four-year (2018 – 2021) intervention commissioned by BMZ in Vietnam. The BIO project aims at enabling the government agencies responsible for managing protected areas to implement mechanisms that provide benefits from biodiversity conservation and sustainable forest management to local communities. The Vietnamese Ministry of Agriculture and Rural Development (MARD) is the lead executive agency at national level. The BIO project supports MARD in the application of successful approaches for the sustainable management and financing for protected forests in four pilot sites (Cát Tiên National Park, Bidoup-Núi Bà National Park, Thần Sa-Phượng Hoàng Nature Reserve, and Trạm Tấu Protection Forest) (SNRD Asia/Pacific, 2019)

The project has **three outputs** (GIZ, 2021b):

- Improving the legal and policy framework that promotes biodiversity conservation and sustainable use of forest ecosystem services in Vietnam
- Improving the financial and management planning of protected areas and forests for biodiversity conservation
- Improving the monitoring and information system of protected areas and forests and Setting-up the prerequisites for the implementation and monitoring of the VPA FLEGT

In agreement with the project team, the assessment did not analyse the VPA FLEGT component due to time constraints.

The BIO Project is expected to end in December 2021; while the donor has already granted the funds for a continuation phase that shall start in 2023, few resources are available to bridge the gap with small actions. In this context, the assessment of the project was seen as an opportunity to inform the development of interventions at the biodiversity-health nexus and support the revision of the new grant promoting the integration of One Health in this particular project.

The project outputs were scanned through the three steps of the analysis framework to assess the application of the OH principles, to identify the gate entries to the biodiversity-health nexus, and to recognise the measures to allow the integration of the OH approach (table 6).

The BIO project does not apply the multisectoral principle as defined in the framework and can therefore not be described as a One Health project. However, it applies all the other OH principles and has high potential to embrace a holistic approach in its implementation. The project works at two gate entries to the biodiversity-health nexus, Wildlife trade and Consumption and Biodiversity Conservation; in particular, the management of Protected Areas is a key entry point to the integration of One Health. At least five measures implemented within the project allow the integration of One Health.

Table 6: Analysis of the BIO project through the framework

Framework step	Project analysis
OH PRINCIPLES 	The project is **not multi-sectoral**. Despite the involvement of different departments and agencies within MARD, MONRE and the Ministry of Planning and Investment (MPI), the project does not engage with the health sector (GIZ, 2021c).
	It is **transdisciplinary**. The stakeholders map clearly highlights the involvement of the different actors, including government, non-state and civil society stakeholders and research institutions. Inclusive collaboration happens across different project activities (GIZ, 2020c, 2021c).
	It is **participatory**. The project actors participate in the decision-making processes. Several community consultations were held to ensure the integration of local knowledge and needs in the PAs and Forest Management Plans (GIZ, 2021c). The ten-year management plan for Cát Tiên National Park is an example of stakeholder participation in the planning process, improved access to and sharing of resources with local communities, integration of local knowledge on ecosystem services, and monitoring of its implementation (SNRD Asia/Pacific, 2019).
	It has a special focus on **prevention**. The project objective is to strengthen governance and benefit-sharing of natural resources, with the final goal of allowing local communities to benefit from ecosystem services while contributing to ecosystem preservation (SNRD Asia/Pacific, 2019).
	It is **decentralised**. The financial and management planning is appointed to the provincial authorities in each target PA and Forest. These include the Provincial People's Committees and the technical departments of the concerned ministry (e.g., agriculture and rural development) (GIZ, 2021c).
	It is **evidence-based**. The *Site Assessment of Governance and Equity* (SAGE) methodology was piloted in Cát Tiên National Park in 2019 and replicated in the Trạm Tấu Protected Forest in 2020. The exercise allowed local communities to assess arrangements and equitable benefit-sharing and discuss how to improve governance in the PA management plans (GIZ, 2021c).
	It is **multi-scalar**. The project plans to test new models of *Payment for Forest Environmental Services* (PFES) in the project areas and use the lessons learnt to contribute to more effective PA management and conservation of ecosystem services (GIZ, 2021c).

GATE ENTRIES 	There are at least 2 gate entries to the biodiversity-health nexus, Wildlife Trade and Consumption and Biodiversity Conservation. Within the latter, Protected Areas (i.e., the four National Parks and Protected Forests) is the key gate entry identified for the project.
MEASURES 	The project applies at least 5 measures that can support the integration of the OH approach (Education and Awareness, Policy Development, Capacity Development, Community Engagement, and Information Sharing).

The analysis of the BIO project through the framework identified clear potentials for the expansion of the biodiversity-health nexus and integration of One Health in future planning. The three outputs that were analysed were 'unpacked' and individually reviewed to identify entry points to the nexus (table 7). These can be discussed and revised within the project team and local stakeholders in view of the planning of the new grant and the small bridging interventions, promoting a co-design approach that takes the One Health perspective into consideration.

The added value of the BIO project is the **conducive environment** in which it is implemented. Opportunities for integrating One Health are existing and tangible for both the identified gate entries: Biodiversity Conservation via Protected Areas, and Wildlife Trade and Consumption.

Vietnam is one of the few countries in Southeast Asia with a functioning *One Health Partnership* (OHP) at national level. The partnership was established in 2016 with a special focus on the prevention, detection, and response to zoonoses. It is a multisectoral collaboration led by MARD, in close collaboration with MOH and MONRE, and supported by the United Nations, international technical agencies, and research institutions. The OHP Strategic Plan was recently revised with the goal of strengthening the legal framework and institutionalising One Health to ensure its implementation across the country (OHP, 2021). The sixth objective of the *2021-2025 OHP Strategic Plan* aims at minimising the human impact on the natural environment promoting, among other activities, responsible use of water, forests, and wildlife (T&C Consulting, 2021). This is a great opportunity to work at the nexus, institutionalising the One Health approach in the *conservation and sustainable use of forests*.

In the framework of wildlife trade and wildlife consumption, two initiatives can open the gate to the nexus. The *Pandemic Prevention Taskforce* (PPTF) groups United Nations, international development agencies, government, and non-governmental organisations, to urge the ending of commercial trade and consumption of wild birds and wild mammals (PPTF, 2021b). The PPTF has already engaged with the OHP to jointly design a country action plan for future pandemic prevention (PPTF, 2021a). The *International Alliance against Health Risks in Wildlife Trade* (The Alliance, 2021)is a government-led initiative launched by BMZ and the German Federal Ministries for Environment, Nature Conservation and Nuclear Safety (BMU). The aim of the Alliance is to bring together political organisations, scientific institutions, and civil society organisations to address the human health threats associated with wildlife trade. The Alliance advocates for the adoption of One Health throughout the value chain of wildlife trade. The Vietnam Country Package, managed by GIZ and realised in closed collaboration with the OHP, aims at enhancing the policy framework and technical standards of commercial wildlife facilities to reduce health risks in wildlife trade and prevent zoonotic diseases (GIZ, 2021e). PPTF and the Alliance provide an important technical platform to support the OHP in its intent to institutionalise One Health and, in particular, to advocate for its application approach in the management of the human-wildlife-ecosystem interface.

An interesting element of the BIO project is the piloting of PFES schemes in the target protected areas. The consultants believe that the PFES approach can be an excellent entry point to the nexus and provide for the adoption of the OH perspective. Due to time constraints, the complexity of the issue and the consultants' limited knowledge on the approach, the potential of PFES at the biodiversity-health nexus was not analysed in detail and requires further research and discussion. Preliminary insights suggest considering the opportunity to integrate One Health into the already existing ecotourism initiatives, to plan a systematic analysis of the ecosystem contributions to the health of humans and animals, and to explore the possibility of investing payment for environmental services into the public health and veterinary system of the PA buffer zones.

Table 7: Potentials for interventions at the biodiversity-health nexus within the BIO project

Gate entries and Measures	Entry points and potentials for interventions
OP1: LEGAL AND POLICY FRAMEWORK	
 Protected Areas  Policy Development Capacity Development	**a) Link with existing partnership** As already mentioned above, the OHP Strategic Plan aims at institutionalising One Health in the country. The active participation in the OHP Framework can allow working at the nexus, further advocating for a OH approach in the conservation and sustainable use of forests. **b) Enlarging the discussion to marginal partners** The analysis framework revealed that the project does not apply the multi-sectoral principle. The inclusion of the health sector in the consultations process for policy and strategy development can be the opportunity to embrace a more holistic One Health approach. This does not require the MOH to become a key partner of the project, but rather to include concerned departments and offices at different levels when specific consultations are made (disease threats at the human-animal-ecosystem interface, biodiversity monitoring and management, livelihood and health of local communities).
OP2: FINANCIAL AND MANAGEMENT PLANNING	
 Protected Areas  Policy Development Capacity Development Community Engagement	As already mentioned for the ProFEB project, the management of Protected Areas is a key entry point to the nexus. The integration of One Health can be planned across different levels of intervention. Please refer to the ProFEB project (table 5) for further details on each suggested intervention. **a) Including new actors in the management governance** Community-based health service providers (village health workers and community animal health workers) can be included in the community consultations for the development of the PA management plan and the discussion on benefits-sharing. Their inclusion can widen the scope of the discussion to include issues related to the health needs and the services gap identified in the local communities.

	b) Developing the capacity on One Health Informing and training the PA Management Committees on the principles and values of a collaborative multisectoral approach can help the integration of One Health in the planning and decision-making processes. **c) Improving livelihood and health in the buffer zones** Improving the livelihood of communities living in buffer zones could contribute to reconciling conservation and development and reducing the risk of encroachment and overexploitation of NTFPs. The impact of these activities can improve when local communities are also provided with essential health services that improve the health of them as well as their livestock. The collaboration with other stakeholders working on health and livelihood in the intervention area can support the expansion of the nexus. **d) Exploring the potentials of the PFES** As mentioned above, the PFES schemes have potential to be a new and interesting entry point at the nexus. The integration of the OH approach requires further research and analysis.
OP3: MONITORING AND INFORMATION SYSTEM	
 Protected Areas Wildlife trade and consumption  Education & Awareness Policy Development Capacity Development Information Sharing	**a) Education and awareness** An important awareness campaign was organised in collaboration with the NGO CHANGE to raise awareness on wildlife consumption, biodiversity loss, and disease risk. The activity was funded through a COVID-19 fund that complemented the project budget in 2020, to address new challenges brought to light by the pandemic. The Education Campaign aimed at creating awareness on the disease risk associated with wildlife trade and consumption. Different methods were employed to reach different groups in the community (business, media, and local communities) (CHANGE and GIZ, 2021). Community awareness and education is a straightforward gate entry to the nexus. An effective integration of the OH approach can be achieved by including the health perspective in the design, planning, and implementation of any campaign. Expanding the consultation process to include health partners in the discussion can deepen the analysis of the situation and support the development of messages tailored to the issues identified. Refer to the ProFEB project (table 5) for further details on each suggested intervention. **b) Wildlife disease surveillance** Online Reporting System (ORS) for biodiversity conservation is not universally applied in Vietnam and the analysis and consolidation of national data from protected areas and forests is challenging (GIZ, 2021g). The project is working with local partners and stakeholders to support the adoption of SMART for biodiversity conservation in Protected Area Management. This can be an excellent opportunity to work at the nexus,

	supporting a further expansion towards the SMART for Health (see table 5 for further details). Acknowledging the challenges faced in adopting the ORS for biodiversity conservation, the adoption of SMART for Health can be a gradual process to ensure the value of monitoring biodiversity and surveilling wildlife health is fully appreciated and owned by local rangers and PA staff. SMART for Health is piloted by WCS in Vietnam[2] and opportunities for collaboration can be explored at this level.

6.3 The SUPA C1 project in ASEAN

The *Sustainable use of Peatlands and Haze Mitigation in ASEAN* Component 1 (SUPA C1) is a five-year (2018 – 2023) intervention commissioned by BMU and co-financed by the European Union and the Federal Republic of Germany. The SUPA C1 has a regional scope and addresses all ASEAN Member States (AMS), with a particular focus on Indonesia and Malaysia. In these two countries, sustainable peatland management practices are tested to inform the national and regional strategies and plans (GIZ, 2020d, 2020e).

SUPA is adopting a multi-level approach, engaging stakeholders at regional, national, sub-national and local levels. Based on this intervention logic, the project is structured into **three work areas:**

- Strengthening regional cooperation by strengthening ASEAN
- Providing specific support to AMS for the implementation of the ASEAN Peatland Management Strategy (APMS) and National Action Plans for Peatlands (NAPPs)
- Generating pilot experiences from Indonesia and Malaysia

The project has **four expected results** (GIZ, 2020e)**:**

- ASEAN Programme on Sustainable Management of Peatlands (SMP), APMS and NAPPs are gradually implemented at local, national, and regional level through enhanced capacity and identification of ASEAN peatland areas
- Significantly reduced peatland fires and associated haze through fire prevention and peatland rehabilitation
- Integrated management of targeted peatlands to maintain ecological functions and biodiversity and reduce GHG emissions
- Peatlands are sustainably managed to enhance livelihood and maintain economic value

As done for the previous projects, the SUPA C1 was scanned through the three steps of the analysis framework to assess the application of OH principles, to identify the gate entries to the nexus, and to recognise the measures for integrating the One Health approach.

[2] Information shared during the Key Informant Interview with WCS Veterinary Technical Advisor for Wildlife Health Program in Laos (10 November 2021)

The SUPA C1 is the only project within the scope of this study that makes clear reference to human health. Large-scale uncontrolled fires occurred in the ASEAN peatland ecosystem over the past two decades, causing severe transboundary smoke haze pollution to affect the health of millions of people. Beside the biodiversity, livelihood and economic benefits, the project has therefore a significant potential on the health and wellbeing of the population in the region. Nonetheless, the project does not involve any health partner in the planning and implementation of its activities. Lacking the application of the multisectoral principle, as defined in the framework, the SUPA C1 cannot be defined as a OH project. However, with the application of all the other OH principles, the project has high potential to integrate One Health and evaluate its impact on the health of populations and livestock in the peatland ecosystem. The project works at two gate entries that can allow embracing a more holistic One Health approach, Climate change and Risk Reduction and Biodiversity Conservation. At least five measures implemented within the project allow the integration of One Health. Table 8 summarises the outcomes of the analysis of the SUPA C1 through the framework.

Table 8: Analysis of the SUPA C1 project through the framework

Framework step	Project analysis
OH PRINCIPLES ☑	The project is **not multi-sectoral**. Despite the involvement of ministries, departments, and agencies across different sectors (Agriculture, Rural Development, Energy and Natural Resources), the project does not engage with the health sector (GIZ, 2020f).
	It is **transdisciplinary**. The Stakeholder Mapping Analysis describes a wide network of actors involved in the project. Stakeholders' roles are distinguished based on their level of influence and importance (key, primary and secondary stakeholders), with inclusive collaboration happening at different levels in the different countries. Stakeholders include public, private, and civil society actors and research institutions (GIZ, 2020f).
	It is **participatory**. The project actors participate in the decision-making processes. Of relevance, the community consultations in the sites identified for the pilot practices for peatlands management in Indonesia and Malaysia. Technically supported by the project team, the local communities lead the identification of practices that are feasible and sustainable in their villages (GIZ, 2021j).
	It has a special focus on **prevention**. The project objective is to mitigate the adverse impact of climate change in ASEAN, manage the risk of wildfires and reduce the transboundary smoke haze, through the sustainable management of peatlands (GIZ, 2020e).
	It is **decentralised**. Work Area 2 supports the implementation of NAPPs in the AMS. National partners identify the target Peatlands Hydrological Units in collaboration with the sub-national government (provincial/district), and this is directly involved in the management of the ecosystem and implementation of plans (GIZ, 2020d, 2021j).
	It is **evidence-based**. The *Catalogues of Methods for Sustainable Peatland Management,* developed for Indonesia and Malaysia, are excellent examples of how the project uses the evidence to inform the design of

	actions. The catalogues systematise the best practices in peatlands management and are used to plan the pilot experiences at village level (GIZ, 2021j, 2021i).
	It is **multi-scalar**. Through Work Area 3, the project aims at identifying and evaluating good practices in SMP and elaborating 'proofs of concept' on ground-proven methodologies that can be used for multiplication and dissemination purposes in the ASEAN region (GIZ, 2020d).
GATE ENTRIES 	There are at least 2 gate entries to the biodiversity-health nexus, Climate Change and Risk Reduction and Biodiversity Conservation.
MEASURES 	The project applies at least 5 measures that can support the integration of the OH approach (Education and Awareness, Policy Development, Capacity Development, Community Engagement, and Information Sharing).

The SUPA C1 project is structured into three Work Areas and four Expected Results, with the former defining the levels of interventions across which the latter are achieved. The analysis of opportunities to integrate One Health followed the same structure, applying a *strategic approach* when revising Work Areas and a more operational approach when looking at the Expected Results. The outcomes of the strategic and operational analysis are reported in tables 9 and 10, respectively. Refer also to tables 5 and 7 for more details regarding the opportunities to work at the biodiversity nexus in the framework of the operational analysis.

Table 9: Potentials for interventions at the nexus within the SUPA C1 project [*strategic analysis*]

Gate entries and Measures	Entry points and potentials for interventions
WA1: REGIONAL COOPERATION	
 Climate Change Biodiversity Conservation  Policy Development Capacity Development Information Sharing	The One Health approach is well-known and appreciated in ASEAN. Solid OH initiatives exist at regional level and across individual Member States. At the 31st ASEAN Summit and related Summits, ASEAN member countries agreed to adopt a One Health Approach to tackle Antimicrobial Resistance (OHP, 2017). More recently, the ASEAN Centre for Biodiversity (ACB) recognised the importance of One Health and the role that ACB can play in public health by supporting biodiversity-related programmes in the ASEAN region (ACB, 2020). The work of the SUPA C1 at the regional level is an excellent opportunity to promote the application of One Health in the management of peatlands. The SMP agenda can be discussed in the already existing platforms (ACB for example) to stress the importance of a more holistic and collaborative approach across sectors, also involving the health partners in the consultations processes.

WA2: SUPPORT TO AMS	
 Climate Change Biodiversity Conservation  Education and Awareness Policy Development Capacity Development Community Engagement	Work Area 2 foresees direct support to the AMS, through the provision of grants for the implementation of action plans of peatlands management. AMS were invited to prepare project proposals that respond to the local needs and priorities in peatlands management and contribute to one or more of SUPA expected results. Project proposals were selected based on pre-selected criteria (Haasler, 2020). The selection of project proposals is an excellent entry point to the nexus and can allow the integration of One Health if the latter is included among the selection criteria. Selecting the project also on the basis of their application of One Health can rapidly support the adoption of a more holistic approach to peatlands management across the AMS.
WA3: PILOT EXPERIENCES	
 Climate Change Biodiversity Conservation  Education and Awareness Policy Development Capacity Development Community Engagement Information Sharing	The project supports the testing of good practices in SMP in Indonesia and Malaysia. Using the catalogue of good practices, local communities are encouraged to identify the approach that best suits their local context and respond to their needs. The pilot experiences are excellent entry points to the nexus, as they can allow testing the effectiveness, efficacy, sustainability, and impact of integrating the OH approach in the SMP. The pilot experiences can help generate evidence on the added value of One Health and inform the shaping of national (and regional) strategic plans that embrace the approach to manage the human-animal-ecosystem interface.

Table 10: Potentials for intervention at the nexus within the SUPA C1 project [*operational analysis*]

Gate entries and Measures	Entry points and potentials for interventions
OP1: PLANS IMPLEMENTATION	
 Climate Change Biodiversity Conservation  Policy Development Capacity Development Information Sharing	As already mentioned for the other projects, the involvement of the health sector can support the work at the nexus and the integration of the OH approach. This does not imply that the MOH become a key stakeholder, but rather the departments of concern (e.g., Non-communicable Diseases, Training and Research, Hygiene and Health promotion) can be involved in the consultation process regarding specific interventions.
OP2: FIRE PREVENTION AND PEATLAND REHABILITATION	
 Climate Change Biodiversity Conservation  Policy Development Capacity Development Community Engagement Information Sharing	**a) Research of the health impact of smoke haze pollution** The project can support the organisation of a research study on the impact of smoke haze pollution on human health. Historical data on uncontrolled land and forest fires in the ASEAN peatland ecosystem can be associated with morbidity and mortality data of respiratory diseases. Research findings can inform the shaping of more holistic policy and the design of integrated interventions at the human-ecosystem interface.

	The engagement of a multidisciplinary team can be an asset to promote the application of the OH approach from research to policy and practice. **b) Integrated community-based fire prevention teams** Community-based fire prevention teams are already engaged in the peatland ecosystems across different AMS. They can be a good entry point to the nexus if expanded to include the frontline health service providers. Trained on the health impact of smoke haze pollution, the community-based volunteers can contribute to create awareness on the health risks of smoke pollution and participate in a safer control of fires.
OP3: INTEGRATED MANAGEMENT TO MAINTAIN ECOLOGICAL FUNCTIONS AND BIODIVERSITY	
 Climate Change Biodiversity Conservation  Education and Awareness Policy Development Capacity Development Community Engagement Information Sharing	Integrated management of peatlands can be an entry point to the nexus if all community actors are involved in the consultation and decision-making processes. The establishment of a Multi-Stakeholder Platform can provide a common space for community learning and sharing (Homann-Kee Tui *et al.*, 2013). The involvement of community-based health actors in the platform can help the identification and adoption of good practices that contribute to ensure public health, while supporting biodiversity conservation.
OP4: SUSTAINABLE MANAGEMENT TO ENHANCE LIVELIHOOD AND MAINTAIN ECONOMIC VALUE	
 Climate Change Biodiversity Conservation  Education and Awareness Policy Development Capacity Development Community Engagement Information Sharing	Sustainable management of peatlands can be an entry point to the nexus if the scope of action is expanded to include the health and wellbeing of the local population. The collaboration with health actors working with the local communities in the peatland ecosystems, can be their entry point to the nexus.

7. CONCLUSIONS AND OUTLOOK

This study aimed to give insight in the process of how biodiversity related projects can implement a One Health approach in their work. The result became a framework that can be used to analyse projects based on their application of OH principles, gate entries and measures.

This has been the first framework that was developed within the SNRD AP for the specific purpose of linking biodiversity to One Health in a practical manner. The scope of the study was an **exploration of the biodiversity-One Health nexus**, the subsequent development of an analysis framework, a trial analysis of three selected projects from within the SNRD AP Biodiversity WG, and a final workshop to discuss the value of the developed framework and the way forward to expand the nexus within the Biodiversity WG.

The key finding of the analysis is that neither of the three assessed projects currently qualifies as a true OH project. In all three cases this can be explained by the high value that the framework puts on the multi-sectoral principle. If there is no existing collaboration between the human health, animal health and the environment sector, the framework does not allow a project to be classified as One Health. However, as further analysis of gate entries and measures showed, there is high potential to implement the approach in one or more areas within the scope of each project.

The **enabling conditions** that are part of the framework remain a necessary requirement; they cannot be neglected when aiming for a successful implementation of One Health. If there is no political framework in place that supports a culture of change and expansion of multi-sectoral collaborations, it is likely that a project can run into difficulties during the process of One Health implementation. The institutionalisation of One Health is key to its effective operationalisation on the ground; it is necessary to initiate an effective collaboration among key actors across sectors and beyond disciplines in order to meet the requirements of a true OH approach. The equity between sectors and disciplines is a key principle of One Health; its operationalisation requires a harmonious and balanced collaboration between the three pillars of human, animal, and environmental health, and the recognition of the intrinsic value of all living things within the ecosystem.

To increase the potential for optimal collaborations, the enabling condition of stakeholder engagement requires a thorough mapping of the actors. This allows projects to explore the current (One Health) landscape in their region, country or area and helps to identify potential stakeholders for collaboration on discussions, planning and (re)co-designing of interventions. Furthermore, the right infrastructure, processes and tools are necessary to facilitate collaborative actions, to ensure transparency in data and information sharing, and to promote the evaluation of the added value of integrated interventions. With regards to the last enabling condition, investment, the workshop offered clarifying insights. On one hand, concerns were raised that it is difficult enough to secure funding for projects in the biodiversity sector and that donors are often not inclined to expand their funding activities beyond the scope of a project or specific activity. On the other hand, it was mentioned that rather than being restricted to specific donors, the adoption of the One Health approach can provide an expansion and diversification of funding portfolios.

As well as offering the potential to diversify the donor base, it is also expected that the incorporation of the One Health approach into projects will reduce operational costs. As new collaborations are started, the discussion and planning stages will provide insight into how

'double-spending' can be avoided on activities, infrastructure, capacity building and project staff. In the long-run, effective collaboration and coordination among sectors will create synergies, provide expanded capacity, and allow financial savings (World Bank, 2018).

Nevertheless, it is important to keep in mind that the adoption of the One Health approach is a **transformative process** in the future of biodiversity projects. Multi-sectoral collaborations require additional time, effort, and investment to allow building trustful relationships beyond disciplines and achieving sustainable outcomes. This will require a radical shift in thinking from all stakeholders involved and it is recommended to find a way to break down the process into manageable and feasible measurements. By doing this, small-scale actions and successes are likely to increase trust in the process and will pave the way for broader support and implementation.

As we have seen for example in the BIO-project in Vietnam, COVID-19 brought unexpected opportunities to implement measures that were not originally planned for the project, but that offered an excellent entry point on the biodiversity-health nexus. This angle might provide other projects with tangible easy-to-reach opportunities to find additional collaborations and funding in order to implement a component into their work in the short term. This will again add value to increase support for this transformation of thinking within the field of conservation. By being able to showcase what is possible on the biodiversity-health nexus, the WG can collaboratively contribute to a portfolio of examples on the successful integration of One Health into biodiversity related projects. This will be an evidence-based way to inform policy and practices, approach a broader range of donors, and help shift the political framework and institutionalisation of One Health.

We recommend that this **framework is considered as a starting point** for the SNRD AP Biodiversity WG members to build up their own understanding of One Health. By going through the exercise of analysing their projects and looking at their components through a One Health lens, they can create and initiate their first One Health interventions. To truly understand and appreciate the value of the framework, it is recommended that assessed projects receive a follow-up through an impact assessment at least one year after the One Health has been integrated at the nexus. This way the framework can be revised to remain relevant, up to date and fully functioning and the outcomes of the impact assessment can be added to the portfolio of successful One Health interventions within the WG.

We advise that in order to retain the knowledge of the working of the analysis framework and its annexes, some form of **capacity building** will be conducted. Ideally a selection of members of the SNRD AP as well as staff from GIZ Head Office will receive training on the framework, to allow its uniform application to other projects within and beyond the Biodiversity WG. The workshop session allowed presenting the framework and the outcomes of its trial application, but participants were overwhelmed with a large amount of information to process. Most questions, comments and discussions that followed largely only touched on One Health in general, rather than on the specifics of the framework. A detailed and practical engagement with the tool will provide a solid way to assess projects, whilst also the opportunity for its revision and refinement. The framework will ideally serve as a 'living document' that the Biodiversity WG regularly adapts for the planning of new and existing projects and discusses and revises to ensure it stays relevant and up to date with time.

Additionally, we recommend organising a workshop on One Health for potential future stakeholders within local networks. During the search for key stakeholders to interview for

the purpose of this study, we encountered many employees of NGOs who were not familiar with the concept. Once explained to them, they generally showed a lot of interest in the potential of using the OH approach. Increased common knowledge on the subject will make future collaborations easier to establish. A One Health workshop has great potential to not only build capacity, but also to start a networking process that can initiate collaborations.

We recommend that **further research** is done to better explore gate entries and opportunities to expand the biodiversity-health nexus that were only marginally addressed through the study. The consultants recognised, for example, that Nature-based Solutions (NbS) can be an excellent entry point to the nexus. These are 'actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human well-being and biodiversity benefits' (IUCN, 2020). Human health is listed among the societal challenges to which NbS is a response and One Health shares at least two of the criteria of the Global Standards for their design and scaling (inclusive, transparent, and empowering governance processes, and adaptive and evidence-based management). As neither of the three assessed projects include NbS in their strategies, the consultants missed the opportunity to deepen the understanding of this as gate entry to the nexus.

We suggest that an **OH Community of Practice** is established within the SNRD AP Biodiversity WG. This can serve as a learning platform where good practices and lessons learnt in individual projects are capitalised to shape a common strategy to harness the biodiversity-health nexus. The space can also provide a platform for further internal discussion around the nexus and the integration of the OH approach in biodiversity projects. The final workshop uncovered, for example, the need for a common definition of environmental health before embarking on a general/assumed adoption of One Health. A thorough discussion on the matter could give insights into a common perspective and meaning of the environmental pillar within One Health. This will help to better understand the contribution of biodiversity conservation projects to *Green Recovery,* in and beyond Southeast Asia.

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