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TURTLE FARM NEAR HAI PHONG CITY, VIETNAM
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SCALING BACK WILDLIFE TRADE IN THE MEKONG DELTA

Applying a Political Economy Lens to the Farmer Loophole with a Focus on Vietnam and Laos

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ACRONYMS AND ABBREVIATIONS

ARI – Aquatic Research Institute (Vietnam)
ATP – Asian Turtle Program
CITES – Convention on International Trade in Endangered Species of Wild Fauna and Flora
CRES – Centre for Resources, and Environment Studies (Vietnam)
DARD – Department of Agricultural and Rural Development (Vietnam)
DOF – Department of Fisheries (Cambodia)
DOIT - Department of Industry and Trade (Vietnam)
DONRE – Department of Natural Resources and Environment (Vietnam)
DoP – Department of Police (Vietnam)
DPI - Department of Planning and Investment (Vietnam)
ENV – Education for Nature – Vietnam
FAO – United Nations' Food and Agriculture Organization
FPD – Forest Protection Department (Vietnam)
LURC - Land use certificate
IEBR – Institute of Ecology and Biological Resources (Vietnam)
INGO – International Non-Governmental Organization
IUCN – International Union for Conservation of Nature
MAF – Ministry of Agriculture and Forestry (Laos)
MAFF - Ministry of Agriculture, Forestry, and Fisheries (Cambodia)
MARD – Ministry of Agricultural and Rural Development (Vietnam)
MONRE – Ministry of Natural Resources and Environment (Vietnam)
MPS – Ministry of Public Security (Vietnam)
M&E – Monitoring and Evaluation
NAPA – Vietnamese National Academy of Public Administration
NGO – Non-Governmental Organization
PanNature – People and Nature Reconciliation
PCC – People's Committee Chairman (Vietnam)
PEER – Partnerships for Enhanced Engagement in Research
PFPD – Provincial Forest Protection Department (Vietnam)
RCT – Randomized Control Trial
USAID – United States Agency for International Development
VCCI – Vietnamese Chamber of Commerce and Industry
VCP – Vietnamese Communist Party
WCS – Wildlife Conservation Society
WWF – World Wide Fund for Nature

EXECUTIVE SUMMARY

The Greater Mekong region across Southeast Asia is host to a wealth of biodiversity that has historically played an important role in local daily life and traditional culture. People from this region have raised animals as pets as well as hunted them for use in medicines, delicacies, and ornaments. In recent years, however, growing economic prosperity in the region has increased the demand for wildlife products. This rise in demand has led to illegal animal trafficking, which greatly threatens the survival of many endangered species in the region.

Chief among the animals facing an increased risk of extinction are turtles. Their rapid decline in the region has led conservationists to call this situation the "Asian Turtle Crisis." Rising demand for turtle products in jewelry and traditional medicine across China, the largest consumer of turtles in the world, accounts for the exploitative turtle trade. With the Chinese economy's growth and the expansion of the middle class, this turtle consumption has become increasingly unsustainable. Nations in the Mekong region play a significant role as suppliers to China due to their geographical proximity and rich turtle fauna. However, the demand for turtles and the proliferation of the local trade in the Mekong region also comes from Vietnam's growing domestic market. National efforts across the Mekong region to conserve turtles include crackdowns and animal confiscations, but domestic laws that conflict with international anti-trafficking laws continue to facilitate the illegal turtle trade.

This report focuses on turtles for three reasons. First, turtles and tortoises are among the most endangered of any of the major groups of vertebrate species, with 50-59 percent of all their modern species listed on the International Union for Conservation of Nature's (IUCN) Red List as either critically endangered, endangered, or vulnerable. Second, focusing on turtles will further the work of the Partnerships for Enhanced Engagement in Research (PEER) researchers whose work focuses on the molecular and morphological evolution, ecology, and conservation of various turtle species. Finally, conserving turtles will help contribute to the preservation of critical features of Vietnamese culture.

ISSUE OVERVIEW: FARMER LOOPHOLE

To combat the overexploitation and the rapid decline of the turtle population in the Mekong Region, this report explores one specific illegal trade facilitator – the farmer loophole – and outlines potential interventions aimed at reducing this activity particularly in Vietnam and Laos. The farmer loophole refers to a situation where wildlife farms launder animals by replacing or supplementing farmed species with wild-caught animals. Although the laws in Vietnam, Laos, and Cambodia protect rare and endangered species from hunting and trading, the laws only apply to those species that are caught in the wild, but not those that are bred in commercial farms. Therefore, farmers are able to sell wild-caught species, which are protected under national laws, by illegally claiming that those animals were commercially bred on farms.

The governance and regulation structures have made it difficult to eliminate the loophole. The complex registration process for commercial wildlife farming and the multitude of actors that farm owners have to contact contributes to the loophole's persistence in Vietnam, Laos, and Cambodia. In Vietnam, there exists a complex system where farm owners have to obtain approval from both the Ministry of Agriculture and Rural Development (MARD) and Ministry of Natural Resources and Environment (MONRE) and follow two different procedures. Possessing permits from two different agencies adds regulatory burdens on prosecutors, who must build cases against violators according to the standards of

these two agencies. Furthermore, confusion due to the overlapping laws and decrees in Vietnam leads enforcement agencies towards inaction, making it easier for perpetrators to flout the laws. In Cambodia, farmers must obtain a permit from a specific department within the Ministry of Agriculture, Forestry, and Fisheries (MAFF), which depends on the particular species they wish to breed. In Laos, farm owners have to get permits from multiple offices to certify the species they plan to breed based on their identity, site of origin, and ultimate destination. The complexity in obtaining permits may lead well-intentioned farm owners to be unaware of the requirements, ignore the cumbersome process, and engage in illegal farming.

Aside from the governance structure, the incomplete decentralization and overlapping authorities at the local level in Vietnam and Laos may also increase opportunities for corruption in the wildlife trade. False permits and manipulation of animal population records are widespread in both nations. Another obstacle to eliminating the farmer loophole is the lack of biological knowledge amongst the forest police and other government officials. In both Vietnam and Laos, confusion abounds regarding which types of animals can be legally bred, traded, transported, and exported. Even if enforcement officials can agree on what species have protected status, officials with limited biological and technological knowledge may be unable to differentiate between wild-caught and farmed animals in the field and evaluate whether caught species are rare or threatened. Finally, low income levels among the population in the agricultural sector, which includes wildlife farmers, serve as incentives for wildlife farms to engage in the illegal trade of wild-caught animals.

RECOMMENDATIONS

To generate a set of recommendations to combat the illegal trade in wildlife in the Mekong, paying particular attention to turtles, we carried out a desk review and conducted interviews and consultations with PEER researchers, host government regulators, local NGOs, international NGOs, U.S. government officials, and private sector actors during a research mission to Vietnam and Laos. Three interventions are proposed in this report to close down the farmer loophole:

1. a behavioral change intervention aimed at consumers of rare animal products to reduce demand in Vietnam;
2. an intervention to improve enforcement by completing the DNA barcoding for Southeast Asian turtle species and training enforcement officers and prosecutors on proper turtle identification using a clear, structured curriculum with identifiable learning goals; and
3. a sustainable farming intervention that trains farmers on proper breeding, animal rearing, and legal responsibilities and allows for some sale of wildlife to supplement incomes.

First, to address the positive demand for turtles, we propose a behavioral change intervention to raise awareness among restaurant owners, shopkeepers, and public consumers about the illegality of turtle trade. By teaching the consequences of the destruction of native turtle populations and the negative impact on Vietnam's cultural heritage, this intervention aims to reduce the demand for turtle products. The theory of change for this intervention is that the reduction in demand should lead to lower profit margins for restaurants and shops, which will, in turn, decrease their incentives to sell turtle products.

Second, we propose an enforcement intervention to address the lack of regulatory and biological knowledge among local enforcement officers and prosecutors. The enforcement intervention involves the introduction of a new curriculum on morphology and DNA identification to enforcement officials.

The new curriculum should be designed to provide enforcement officials with the skills that will allow them to detect the origin of farmed animals and distinguish among different species and lineages. The theory of change for this intervention is that stronger enforcement will decrease the profit margins of traffickers and thus reduce the incentives for farm owners to engage in wildlife laundering.

Third, we propose a sustainable farming intervention to induce commercial farm owners to engage in the proper breeding of animals. This intervention will provide farmers with appropriate breeding equipment and knowledge on safe and sustainable breeding techniques. The theory of change for this intervention is that greater knowledge of breeding techniques and availability of proper equipment will lower the cost of breeding to the point that it is cheaper to breed turtles than to launder them illegally.

With all three interventions, we suggest using randomized controlled trials (RCTs) for evaluating the success of the interventions, and specifically outline research designs that deliver the most precise evidence of impact, effectiveness, and potential costs. Use of RCTs for these programs is necessary as all three suggested solutions are expensive, and contain high levels of uncertainty and, in some cases, controversy among subject matter experts. A rollout that experiments with each of the suggested interventions on a pilot basis is critical for rigorously documenting whether the interventions achieve their stated goals in a cost-effective manner without generating unanticipated secondary effects or behaviors that undermine the goals of the project. Only by comparing these interventions to control conditions, where no changes are made, can we document whether active intervention is preferable to taking no action. Moreover, only by comparing each intervention against the others in regard to their stated goals can we learn where USAID and other practitioners should channel their resources and efforts. Specifically, our RCTs aim to measure: 1) Does the behavioral change toolkit reduce demand and consumption of turtle products in Vietnam? 2) Does scientific and legal training of enforcement officers increase the number of apprehensions and prosecutions of turtle traffickers? 3) Will training on sustainable farming techniques lead to the substitution of wild-caught turtles with sustainably bred turtles in Vietnamese and external markets? Ultimately, we wish to learn which intervention or combination of the three interventions will do the most to rehabilitate Vietnam's dwindling turtle populations.

1. INTRODUCTION

The Greater Mekong region across Southeast Asia is host to a wealth of biodiversity. Between 1997 and 2016, researchers discovered 2,524 new species of plants, birds, mammals, reptiles, fish, and amphibians in the region (WWF, 2016a). This bountiful wildlife has historically played an important role in local daily life and traditional culture. Across the region, animals are raised as pets and their parts are used in medicines and delicacies and also crafted into ornaments. However, growing economic prosperity in the region has increased the demand for wildlife products. In Vietnam alone, over 4,500 tons of wildlife products are now traded and consumed yearly (WWF, 2018). To keep up with increasing demand, high levels of hunting and capturing have greatly threatened the survival of many endangered species, some more than others.

In the Greater Mekong and globally, extensive wildlife trafficking routes have taken root, contributing, for example, to the precipitous decline in land-based tortoise and freshwater turtle populations. Turtles are among the world's fauna that is most threatened with extinction (56 percent of its species), which is second only to primates (64 percent) and followed closely by amphibians (41 percent), mammals (25 percent), bony fish (15 percent), and birds (13 percent) (van Dijk et al., 2000; Kiester and Olson, 2011; Rhodin et al., 2018). The decline in population since the late 1990s is most apparent in Asia where more than a third of all turtle species are found (Zoological Society of London, 2017). According to a 2011 review conducted by the International Union for Conservation of Nature (IUCN), the global authority on the conservation status of animal species, 17 of the 25 most endangered turtle species are native to Asia. Fittingly, this recent phenomenon where many turtle species are on the brink of extinction has been dubbed the "Asian Turtle Crisis" (Cheung and Dudgeon, 2006; Ly et al., 2011).

In Asia, turtles are threatened due to their overexploitation via the wildlife trade, local consumption trends, and alterations in their natural habitats from human activity and climate change. Rapid population growth and rural land development to support agriculture, industry, or human habitation needs have transformed and eradicated many land and water biomes, which turtles call home. Rising demand for turtle products in China, the largest consumer of turtles in the world, and other parts of Asia account for the exploitative turtle trade (Cheung and Dudgeon, 2006; Linh et al., 2016; Wildlife Conservation Society, 2018). For centuries, the Chinese people have consumed turtles and used them to make jewelry and traditional medicine. A prospering Chinese economy since the 1990s and a growing middle class has made way for an unsustainable consumption of turtle species (Cheung and Dudgeon, 2006). While part of the supply is met by Chinese turtle farms that mass-produce select species, imports of supposedly wild turtles from neighboring nations are substantial (Haitao et al., 2008). Still, China is not the sole destination for the trafficked turtles. The spread of traditional Chinese medicine and the expansion of markets in Southeast Asia have also contributed to the expansion of the turtle trade throughout the region (van Dijk et al., 2000).[1] True demand may never be fully known due to the clandestine nature of the trade, but scholars note it is over 13,000 metric tons of live turtles per year and "almost impossible to overestimate" (Kiester and Olson, 2011; Ly et al., 2011).

[1] While we recognize the important role that China has in creating the demand for the trade in turtles in the Mekong, it was beyond the scope of this study to offer recommendations to influence Chinese consumption of wildlife.

Vietnam's role in the turtle trade is significant due to its geographical proximity to China and its rich turtle fauna (Cheung and Dudgeon, 2006). While trafficking endangered turtles is officially illegal in Vietnam since it signed the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1994, loose regulations have enabled Vietnam to export endemic species and serve as a transit spot along regional and international trade routes (Van et al., 2019). Vietnam's growing domestic market, due in large part to a growing middle class, has also contributed to the proliferation of local trade (Linh et al., 2016). National efforts to conserve turtles include crackdowns and animal confiscations, but domestic laws that conflict with international anti-trafficking laws continue to facilitate the illegal turtle trade. As species become scarcer, the market price of turtles rise as does the entry of more actors wanting to capitalize on the trade (Sung et al., 2013).

The decline of native turtle species is particularly tragic in Vietnam, where the turtle is revered as one of the country's four holy animals and mythical turtles have twice played critical roles in stories of Vietnam's independence from China (Bettelheim, 2012). In 2016, when one of four critically endangered Đồng Mô (*Rafetus leloii*) turtles left in the world named Cụ Rùa, meaning grandfather turtle, died in Hanoi's Lake of the Returned Sword, it was considered a national tragedy and a bad omen for Vietnam's future (Crane, 2018; Sherwell, 2016). Because of its historical and cultural importance, Vietnam's dwindling turtle population is an ideal target for USAID's *Wonders of the Mekong* program, which seeks to appeal to local decision-makers by connecting conservation to a country's national and cultural heritage (USAID, 2018).

The recommendations and analysis in this report regarding the illegal trade in wildlife in the Mekong are based on a desk review and interviews conducted during a research mission to Vietnam and Laos. First, the research team completed a desk study and literature, covering previous USAID-funded anti-trafficking work and academic literature on conservation and anti-trafficking. This review included a focused deep dive into the literature and previous empirical work on three pillars of anti-trafficking interventions: behavioral change and modification, technology and enforcement, and sustainable farming. A special emphasis was placed on the review of PEER research products (Project 3-149: Biodiversity conservation in Indochina: Integrating research and training to enhance wildlife trade management).[2] USAID has supported PEER researchers in Vietnam and Laos to improve conservation technology and preserve biodiversity in the Mekong region. Dr. Minh Le, the PEER-PI researcher from Vietnam, is working on expanding a DNA database that can help with species identification, while Dr. Sengdeuane Wayakone, a PEER researcher from Laos, is working on environmental impact analysis. Second, the team conducted field research, focusing on current anti-trafficking efforts and their success rates, in Vietnam and Laos[3] from December 2018 to January 2019 with stakeholders in the region. This included interviews and consultations with the PEER researchers, host government regulators, local NGOs, international NGOs, U.S. government officials, and private sector actors. See Appendix II for a complete list of respondents.

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[2] Partnerships for Enhanced Engagement in Research (PEER) is a USAID sponsored program to fund scientists in developing countries to work with a US partner on research and capacity-building activities of importance to USAID. Dr. Mary Blair from the Center for Biodiversity and Conservation at the American Museum of Natural History was the US partner.

[3] Amongst the Mekong Delta countries, field research was only done in Vietnam and Laos.

To help address the widespread Asian turtle crisis, this report explores one specific illegal trade facilitator – the farmer loophole – and outlines potential interventions aimed at reducing this activity. The remainder of the report covers three main topics. Section two discusses the rationale of focusing on turtles. Section three explains the concept of the farmer loophole in the context of Vietnam and Laos, the critical political economy[4] issues, and factors that allow the loophole to persist such as corruption, informational gaps, and poverty. This part also discusses the potential impact of the proposed interventions that would help regulate the farmer loophole. Finally, section four outlines three broad interventions and associated experiments that would lessen the contribution of the farmer loophole in the illegal trafficking of turtles. These interventions include reducing demand through behavioral change, bolstering law enforcement through robust training and use of new technology, and proposing sustainable farming as an alternative to illegal commercial wildlife farming. In proposing these recommendations, we endeavor to build off and expand the PEER in the region. While none of these interventions alone will resolve the problem entirely, there is sufficient reason to believe each will play a role at reducing contributing factors to the problem along the supply chain of illegal turtle trafficking. Finally, this report concludes with a reflection on the proposals' potential for impact and the possibility of collaboration with PEER researchers.

2. THE RELEVANCE OF TURTLES IN WILDLIFE TRAFFICKING IN VIETNAM

2.1 WHY TURTLES?

We focus on turtles for three important reasons: 1) the endangered status of turtles; 2) the alignment of the proposed interventions with the research interests of Dr. Minh Le, the Principal Investigator for PEER research in Vietnam; and 3) the negative impact of indigenous turtle extinction on Vietnamese culture.

First, turtles and tortoises are among the most endangered of any of the major groups of vertebrate species, with 50-59 percent of all their modern species belonging on IUCN's Red List as either critically endangered, endangered, or vulnerable (Rhodin et al., 2018). As mentioned earlier, the ongoing Asian Turtle Crisis means many turtle species are in precipitous decline, with several species on the brink of extinction in Vietnam (Ly et al., 2011). The high volume of turtle trade in Vietnam comes from the high demand for turtle, as turtles are consumed as delicacies and medicine as well as being raised as pets in Vietnam (Linh et al., 2016). This demand is evident from the fact that turtles comprise the largest animal group among the wildlife seized in Vietnam. Nearly one-third (8,118 wildlife units) of the 26,221 wildlife units confiscated from 2013 to 2017 were turtles (Wildlife Conservation Society, 2018). Out of 1,504 arrests involving wildlife, 150 (10.31 percent) involved turtles, making them the second largest species group among wildlife arrests in Vietnam (Wildlife Conservation Society, 2018). Furthermore, turtle species represent a large proportion of exported species from Vietnam due to their high demand in

[4] Political economy studies the relationships between society, state, and markets. The purpose of applying this lens to wildlife trade is to understand why illicit activity persists.

China. The Chinese turtle market is worth $750 million annually with over 300 million turtles being sold yearly (Van et al., 2019).

Although the majority of turtles are smuggled to China, there is a substantial market for rare turtles within Vietnam. Indeed, the endangered Vietnamese Box turtle (*Cuora picturata*) is so rare and has been such a victim of trafficking that it was thought to be extinct until one was discovered in a Vietnamese market in 1998, and it is now far more likely to be found in markets than in the wild. As mentioned in the introduction, turtles are consumed as food and medicine, used as ornaments, and raised as pets. People in China and Vietnam consume turtles (especially soft-shell turtles) in restaurants, and rare turtles are thought to be a delicacy. They also purchase products made from hard-shell turtles in souvenir shops such as jewelry, including bangles, beaded bracelets, earrings, decorative pins, and hair combs (Crandall, 2014; Stiles, 2009). Finally, in traditional medicine, nearly every part of the turtle is thought to serve some purpose. The eggs, blood, and bile are all added to wine as cures, whereas the skin and head are eaten alone without additives. The shell is often ground into powder or boiled in water, and the urine is used as drops in the ear or consumed as a beverage. These have been devised as remedies to cure coughs, prolapse of the rectum, deafness, and cancer. Many people believe they provide benefits such as beauty maintenance for women and sexual performance for men. Because of these beliefs and their symbolic importance, turtles have been highly sought after for more than 3,000 years.

Besides in-person transactions found in markets, souvenir shops, and traditional medicine shops, illegal turtle transactions can also occur online. Social network websites such as Facebook allow for fast exchanges between sellers and buyers since sellers can advertise their inventory to buyers who no longer have to travel to markets and shops to browse through products (Van et al., 2019). Reductions in transaction costs through online sales can potentially increase the volume of the illegal turtle trade across the region. A 2017-2018 study on Facebook groups suggests that many individuals are actively part of online turtle exchanges, as noted by the number of members in three popular groups: The Vietnam Turtle Love Association (Hội Yêu Rùa Việt Nam (11,397 members)), The Vietnamese Dried Turtle Love Association (Hội Yêu Rùa Cạn (10,784 members)), and The Vietnamese Ornamental Turtle Love Association (Hội Yêu Rùa Kiểng Việt Nam (9,462 members)) (Van et al., 2019). Details on which species are traded online are limited, although broad findings indicate that "juveniles were the most widely traded, accounting for 41.3 percent, followed by hatchlings (24.0 percent), sub-adults and adults were less preferred by customers with 22.5 percent and 12.1 percent, respectively" (Linh et al., 2016). Ultimately, turtles traded online are consumed as food and medicine or raised as pets (Van et al., 2019).

In the past few years, as the supply of turtles has declined and the demand from consumers has increased, the price of turtles has risen sharply and greater numbers of actors have become involved in the illegal turtle trade. In Vietnam, from 2013 through 2015, the Indochinese Box turtle price rose five times from $31.70 per kg to $164.96 per kg, and the micro sized Black-breasted Leaf turtle rose from around $2 a specimen to $105 (Linh et al., 2016). By 2015, the Four-eyed turtle had a value between $130 and $250 per kg, double its average price in 2013. [5] Such increases in prices and the potential for high profits in turn incentivize more people such as hunters and sellers to take part in the turtle trade

[5] Prices for some species have remained relatively unchanged since in the mid-2010s, such as the Asian Yellow pond turtle and the Chinese Soft-shell turtle, with the latter farmed commonly and featured prominently in restaurant dishes across Vietnam.

(Linh et al., 2016). At the same time, the increase in rarity of certain turtle species has driven up the utility consumers derive from purchasing them, further increasing the number of consumers. The combination of the increase in participation from various supply-side and demand-side actors in the turtle market has contributed to the overexploitation of several species. Combined with the lack of attention by national authorities and donors, targeted conservation efforts are needed to alleviate the decline in population of turtles. See Appendix 1 for a list of particularly relevant turtle species and the role they play in the trade.

Secondly, centering our recommendations on turtles will help further the work of the PEER researchers whose research focuses on the molecular and morphological evolution, ecology, and conservation of turtles. The knowledge gathered so far has assisted several turtle conservation projects, including surveys assessing the population of endangered turtles in northern and central Vietnam. In addition, it has supported the building and expansion of a DNA database for turtles (Le and Sophat, 2018). Since turtles are the only group with an extensive DNA database in Vietnam, focusing on turtles would allow for the evaluation of one of the recommendations proposed: the use of DNA barcoding to supplement enforcement. We expand on the PEER research work below, when we explore an enforcement intervention based on the database.

Third, the Asian Turtle Crisis is also a tragedy on historical sociocultural grounds, as the turtle (*quy*) plays such a prominent role in Vietnam's culture. The turtle is one of Vietnam's four holy animals alongside the dragon, lion, and phoenix. In Quốc Tử Giám, Vietnam's first university, now referred to as the Temple of Literature, successful mandarins had their names displayed on large Turtle Steles, which decorate the temple's courtyard (Tran et al., 2004). Twice in Vietnam's national narrative, golden turtles (*kim quy*) have played vital roles in independence. During the Âu Lạc period (257 to 205 BC), a golden turtle gave King An Dương Vương a claw, which he used as a trigger for his crossbow, allowing him to repel an invasion from the Chinese warlord, Triệu Đà (Ronguqan, 2015). Later in 1418, according to Vietnamese mythology, a golden turtle provided King Lê Lợi with the sword to defeat the Chinese and bring independence to Vietnam, which he returned while crossing a lake in Hanoi. The event is still commemorated with a tower in the middle of Hồ Hoàn Kiếm, the Lake of the Returned Sword (Bettlheim, 2012). For many years after, the Vietnamese would come visit the rare Đồng Mô giant soft-shelled turtles (*Rafetus swinhoei*) that swam in the lake for good fortune. When the last Đồng Mô turtle in Hồ Hoàn Kiếm died in 2016, it was mourned as a national tragedy and was considered a bad omen for Vietnam's future (Crane, 2018; Sherwell, 2016). In Vietnam, the extinction of indigenous turtle species and the ongoing turtle crisis extends beyond the decline of biodiversity and strikes at the very heart of the country's culture and myth. As such, a program to revitalize turtles in the country is an ideal target for the communication strategies proposed by USAID's *Wonders of the Mekong* program (USAID, 2018). Figure 1 below depicts the high salience of turtles in Vietnamese culture.

FIGURE 1. CRITICAL REPRESENTATIONS OF TURTLES IN VIETNAMESE CULTURE

Turtle Steles at the Temple of Literature[6]

Golden Turtle with sword[7]

Turtle Tower at Hồ Hoàn Kiếm[8]

Đồng Mô turtle[9]

2.2 TURTLE SPECIES

See Appendix I in the Annex for a review of endangered turtle species that are part of the wildlife trade in the Greater Mekong Sub-region.

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[6] Source: By Gryffindor - Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=15260467
[7] Source: By Rdavout - Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=6805556
[8] Source: By Rungbachduong - Own work, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=3848535
[9] Source: By Phuongcacanh at Vietnamese Wikipedia, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=14538550

3. FARMER LOOPHOLE

3.1 THE FARMER LOOPHOLE AND ITS CONTEXT IN MEKONG REGION

The farmer loophole refers to the situation where commercial farms in Vietnam, Laos, and Cambodia exploit ambiguities between national and international regulatory and enforcement laws to become fronts for wildlife laundering. To meet high consumer demands for specific species, wildlife farms launder animals by replacing or supplementing farmed species with wild-caught animals. In Vietnam, catching endangered species that are listed in Decree 32/2006/ND-CP, Decree 160/2013/ND-CP, Decision 82/2008/QD-BNN, Circular 47/2012/TT-BNNPTNT, and CITES Appendices I and II from the wild is punishable by law (Education for Nature – Vietnam, 2018). Similarly, in Laos, catching species and trading wild caught species that are listed on CITES Appendices I and II and the Wildlife and Aquatic Law/2007/NA is illegal and subject to legal punishments (Phiapalath, 2016). For Cambodia, catching or possessing endangered or rare species is illegal and punishable according to the Law on Forestry, 2002 and the Protected Areas Law, 2008 (UNODC, 2015). The lists of endangered and rare species are created and issued through a government declaration (Prakas) by the Ministry of Agriculture, Forestry, and Fisheries (MAFF) of Cambodia (UNODC, 2015). The two laws in Cambodia do not make specific reference to CITES and instead make general references to international conventions, protocols, and agreements (UNODC, 2015). Table 1 provides a summary of the laws relevant to the wildlife trade in Vietnam, Laos, and Cambodia. Descriptions of the relevant laws and links to the full laws are provided in Appendix III. However, endangered species are only protected in these three countries if they are caught in the wild, meaning the protection does not extend to species that are commercially bred in farms. Thus, farmers sell protected wild-caught animals by illegally claiming that those animals were bred on their farms.[10]

TABLE 1: LAWS RELEVANT TO THE WILDLIFE TRADE

LOCATION	LAWS
Vietnam (Vu et al., 2017)	1. CITES Appendix I and II (since 1994) 2. Decree 32/2006/ND-CP (Ministry of Agriculture and Rural Development) 3. Decree 160/2013/ND-CP (Ministry of Natural Resources and the Environment)
Laos (Phiapalath, 2016)	1. CITES Appendix I and II (since 2004) 2. Wildlife and Aquatic Law/2007/NA (Ministry of Agriculture and Forestry)
Cambodia (UNODC, 2015)	1. Law on Forestry, 2002 2. Protected Areas Law, 2008

[10] This report focuses primarily on the farmer loophole problem in Vietnam and Laos because fieldwork has been completed in these two countries.

In Vietnam, where thousands of people engage in commercial farming, the influence of the farmer loophole is widespread (Vu et al., 2017). The aforementioned Vietnamese decrees and circulars allow for the farming of all species except pangolins, which are difficult to raise and keep in captivity. A survey by Education for Nature Vietnam (ENV) on 26 farms in 2014 and 2015 indicated that only a third of those surveyed actually engaged in proper breeding practices on their farms (Vu et al., 2017).[11] The rest did not possess equipment for viable breeding and traded species that do not breed well in captivity. As such, these poorly equipped farms are likely engaged in laundering by selling trafficked animals as farm-reared. Another 2014 census of southern Vietnam's wildlife farms, conducted by the United Nations' Food and Agriculture Agency (FAO) and Provincial Forest Protection Departments (PFPDs), documented 4,099 active farms in 12 of Vietnam's 58 provinces. Over 95 percent of these farms dealt with only one or two species, but the remaining 5 percent accounted for the vast majority of total specimens. Overall, the survey identified 1.5 million animals belonging to 175 species, with 62 percent of those animals being either crocodiles, snakes, or turtles. Over half of the identified species belong on CITES Appendix II (FAO, 2014). Similar monitoring studies have not been conducted in Laos (Stuart and Timmins, 2000).

There are two legal regimes that govern the commercial farming of wildlife in Vietnam. The first set of regulations, which lists the species that can be farmed and how to handle illegal activity (Decree 32/2006/ND-CP, Circular 47/2012/TT-BNNPTNT and Circular 90/2008/TT-BNN), comes from the Ministry of Agricultural and Rural Development (MARD). The second set of laws expands wildlife protection to more species (Decree 160/2013/ND-CP) and is issued by the Ministry of Natural Resources and Environment (MONRE). Collectively, both sets of regulations require permits for the breeding and rearing, transportation, import, export, and re-export of protected species. However, the legislative documents differ in the animals protected and their enforcement apparatus. Local enforcement officers at the Forest Protection Department (FPD), which is under MARD, Environmental Police, and the Ministry of Public Security (MPS), express confusion over which documents are needed and along which stages of the farming operation.[12] They also acknowledge difficulty identifying protected species and understanding whether these animals can be safely bred and raised in captivity. This is the ambiguity that farmers exploit to operate illegal businesses that import or capture protected species and sell them in Vietnam or export them to China. Research confirms that management and administration of protected areas is fragmented with MARD and MONRE operating under different institutional objectives (An et al., 2018). Trafficked animals are thus turned into legally sold commercial products, which is the very definition of laundering.

To provide further details on the activities of commercial farms, we performed our own analysis of the General Statistical Office's annual Vietnamese Enterprise Census (GSO 2018) using the most recently released public data from 2014. The survey does not include all businesses in Vietnam, but it provides a good indication of the available information on commercial farms that we can use to understand their sales and trading behavior. The Enterprise Census includes 352,206 registered private businesses,[13] omitting state owned enterprises, foreign operations, and informal, household companies that do not

[11] The surveyed farms were distributed across 10 provinces in northern, central, and southern Vietnam.
[12] Interview with Bui Thi Ha, Vice Director of Crime Hotline, Education for Nature Vietnam (ENV).
[13] The survey is a census of all enterprises with over 10 employees, but randomly sampled businesses below 10 employees and thus undercounts total activity.

have registration certificates.[14] Of these, 9,176 operations are listed as Sector A or "Agriculture, Forestry, and Fishing," of which 7,243 engage in Industry 01, "Crop and animal production, hunting and related service activities." Furthermore, we identified 473 registered businesses, which engage in some form of livestock rearing. Most of these farms, however, raise traditional animals, such as poultry, pigs, goats and cows. Only 57 farms, less than one percent of all agricultural businesses, are listed in the final category, where exotic animals and wildlife farms are considered.

There are several noteworthy takeaways from these statistics. First, the GSO industrial codes do not include classifications beyond the fourth digit, so we cannot tell which specific animals are raised on individual farms from the aggregate data. Second, the official numbers exclude informal businesses that do not declare their commercial wildlife farming at all, that register themselves under a different industrial code than A0149, or that do not possess the full set of registration documents. This is the most likely reason why the number of commercial farms that we identified is much less than noted by other sources. It also illustrates the complications that the farmer loophole raises for proper regulation. Third, this data excludes any business that engages in wildlife farming alongside traditional cash crop or other livestock farming, which may be registered as the primary business. Fifty-seven operations are certainly understated. Consequently, all projects that attempt to work with wildlife farms will need to first assemble a comprehensive sampling frame based on multiple data sources and direct, investigative observation.

Similar to Vietnam, the legal regime governing wildlife trade and farming in Laos is not straightforward. In Laos, the list of animals on CITES Appendices I and II takes precedence over the list of animals noted on the national Wildlife and Aquatic Law/2007/NA, and trafficking endangered species on CITES Appendices I and II is punishable by the new penal code that took effect in 2018 (Phiapalath, 2018). Animals in Laotian farms can be traded legally with permits, but animals on the varying protection lists require permits from different levels of government (district, provincial, national) (Phiapalath, 2016). Additionally, farms cannot trade the first-generation species that initially stocked the farms and must instead only trade the second-generation stock (Livingstone and Shepherd, 2016). In Laos, private companies began to operate wildlife farms in the early 2000s (Phiapalath, 2016). The specific number of species farmed in Laos is unclear due to the lack of systemic studies, but observed animals include bears, macaque monkeys, tiger, sambar, spotted deer, and various species of snakes and turtles (Phiapalath, 2016). The exact number of wildlife farms is also unknown due to the lack of a formalized process for farm registrations, but there is evidence that wild-caught animals are laundered for regional trade through farms (Phiapalath, 2016).

The Ministry of Agriculture and Forestry (MAF) is in charge of commercial wildlife farming in Laos (Lüthi, 2012). Animal species are grouped into three broad categories: prohibited, managed, and general. Central government permission is needed to operate businesses that involve animals from the prohibited categories, and MAF permits are needed for trade involving species from the management category. For businesses involving animals from the general category, permits can be obtained from the provincial agricultural and forestry divisions. Besides operating permits, farms require transportation permits from either the national, provincial, or district offices of MAF. MAF officials face similar problems to local enforcement officials in Vietnam, where they too lack the resources and knowledge to

[14] Figures are based on the authors' own calculation of the 2014 GSO Enterprise Census, which they obtained as part of this project.

distinguish between farmed and wild-caught animals. Recent audits indicate that MAF officials fail to conduct thorough inspections of farms and sign-off on permits that inflate the number of animals housed in farms (Phiapalath, 2018). This practice allows Laotian farms to supplement their holdings with wild-caught animals.

In Cambodia, the 2002 Law on Forestry and the 2008 Protected Areas Law are the primary sources of legal protection for endangered wildlife (UNODC, 2015). The Law on Forestry, 2002 addresses illegal hunting outside protected areas, while the Protected Areas Law, 2008 is concerned with illegal hunting occurring within protected areas. Under both statutes, all wildlife species are categorized as endangered, rare, or common, with the hunting or harming of either endangered or rare species deemed as illegal and punishable by law (Kingdom of Cambodia, 2003; UNODC, 2015). The species are sorted into the three categories by MAFF through the issue of a government declaration (Prakas). To commercially farm in Cambodia, one needs to obtain a permit from the Ministry of Agriculture, Forestry, and Fisheries (MAFF) (Japan International Cooperation Agency, 2013). The specific department the farm owner needs the permit from is contingent on the particular species the farmer declares to breed. For example, the Department of Fisheries (DOF) within MAFF handles permits for aquatic and marine wildlife, such as turtles, crocodiles, and snakes (Torell et al., 2004). Farm owners planning to breed terrestrial species would contact the Department of Wildlife and Forestry within MAFF to obtain a permit.

The ability to engage in wildlife farming and trade of wildlife from commercial farms creates a loophole that allows wild-caught animals to be laundered through farms similar to Vietnam and Laos (Down, 2016). Cambodian farmers have been known to engage in wildlife laundering, and they serve as turtle suppliers to other supply chain actors in Vietnam. Efforts to crack down on laundering have been ongoing, and in 2014, a joint program with local authorities and WCS successfully rescued 23 turtles in Mondulkiri, including species that were either endangered or threatened (Murray and Vandy, 2014). Rescuers suspect these species were most likely headed to Vietnam since the confiscations took place within a few kilometers of its border. In another case, 102 elongated tortoises were rescued from being smuggled into Vietnam while en route to Phnom Penh (Phys.org, 2016). The efforts, however, have yet to eradicate wildlife laundering and farmer loophole continues to pose problems in Cambodia.

3.2 CRITICAL POLITICAL ECONOMY ISSUES IN FARMER LOOPHOLE

While the political economy issues discussed below are relevant across the Mekong, the discussion will focus on Vietnam and Laos since fieldwork was undertaken in these two countries, and the research team has a much better sense of the precise mechanisms through which the loophole operates.

3.2.1 LOCAL-CENTRAL RELATIONS

One of the first things every student of Vietnam learns is the expression, "the king's laws stop at village gates" (*Phép vua thua lệ làng*) which alludes to the critical role that sub-national leaders play in choosing to implement or defy central policies. This narrative is central to many historical Vietnamese accounts, and from Vietnamese imperial history to the present day, central leaders have been challenged by the physical and cultural distance of their far-flung empires (Marr 2004, Goscha 2016). In the Đổi Mới or reform era, which liberalized the Vietnamese domestic private sector and opened the economy to international trade and investment, the frictions have continued between central initiatives and local implementation of those directives. At the same time, the booming Đổi Mới economy has created wide

disparities in economic performance and welfare across Vietnam's regions. Vietnamese authorities are keenly concerned about the tension between allowing successful localities to tailor economic and administrative policies to local tastes and demands and the need to ameliorate the rising inequality between localities. The challenge has been manifested in the continual experimentation with the institutions governing central-local relations. At times, Vietnam has unveiled far-reaching decentralization plans, providing provinces (especially economically successful locations) extensive latitude and autonomy in local initiatives, such as industrial zones and one-stop-shops for business registration. At other times, it has curbed them through formal and informal means and chastised fence-breakers, provinces whose reform have surpassed central law, for going too far. As the report explains in more detail below, a key issue in the famer loophole is the limbo created by incomplete decentralization of business regulations that has delegated enforcement to local governments.

Constitutionally, Vietnam is a unitary state. The present structure of the Vietnamese provincial governance system has its origins in Articles 119 to 125 of the 1992 Vietnamese Constitution (VNA 1992). The 1992 Constitution as well as the more recent 2013 Constitution specify the explicit roles of the different local government bodies, and the powers of local institutions have been refined and made more concrete by additional laws and implementing documents.

Figure 2 below depicts the Vietnamese administrative framework, illustrating how dual subordination affects regulation and enforcement of commercial wildlife farming. As Figure 2 shows, the overall party-state architecture has both horizontal and vertical dimensions. Agencies with clear oversight over wildlife regulation are highlighted in green. Horizontally, the system is separated into Vietnamese Communist Party (VCP), the executive (People's Committee), legislature (People's Council), and judicial (People's Court/Procuracy) branches. Vertically, the system consists of the central, provincial, district, and commune levels. The horizontal division is replicated at each subnational level, so the executive, legislature, and judicial branches exist in every subnational unit of the country (Fforde 2003, Kerkvliet 2004). Because Vietnam is a single-party regime, all institutions are accountable to the VCP and must pay attention to the decisions made by the Party Secretary (Bí thư Tỉnh ủy). In practice, the actual level of subordination to the VCP can differ based on geographical history, cultural, and independent financial resources available to the People's Committee Chairman (Chủ tịch Ủy ban nhân dân).

Vietnamese local executive departments and agencies are dual subordinate, meaning that they report both to the People's Committee Chairman (PCC) at the local level and to the line ministry at the capital in Hanoi. For example, the Department of Agricultural and Rural Development (DARD), which houses the Forestry Protection Department (FPD), Department of Natural Resources and Environment (DONRE), and Department of Police (DoP), reports both to the PCC and the Ministry of Agricultural and Rural Development (MARD). Ideally, the system should deliver central objectives from the line ministry guided by implementation with local knowledge by the PCC. In practice, the relative importance of these two accountability measures differs across locality and is heavily determined by the economic resources of the province (Malesky 2004, 2008).[15]

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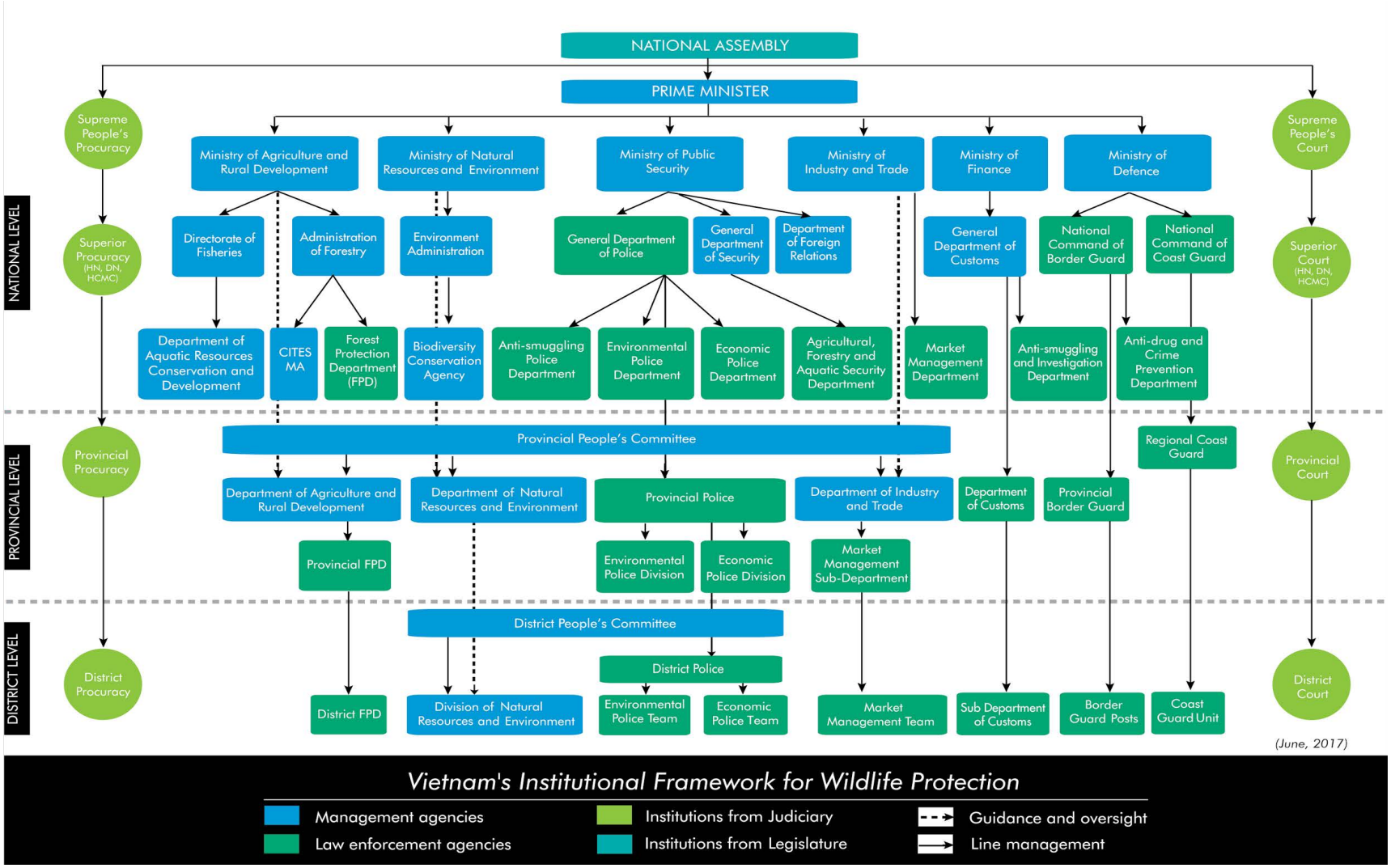
[15] See Decree 50-HDBT (22/3/98) with details on implementing Decree 217 and the State Ordinance on Principles of Accounting and Statistics (29/9/98) and Economic Contracts (29/9/89). The Law on the Organization of People's Councils and People's Committees, 1994; The Ordinance on the Concrete tasks and Powers of the People's Council and People's Committee at each Level, 1996; Ordinance on the Supervision and Guidance by the Standing

Because of Laos' and Vietnam's French colonial and shared communist heritage and the important role that Vietnam played in the formation and consolidation of the Laotian state, Laos' institutions and local-central relations are very similar to those in Vietnam (Bertrand, 2013). Like Vietnam, Laos is a single-party state that is nominally a central system. Although the provincial governor has the *de jure* policy making power, the political authority of the provincial governors is limited. The 1991 Constitution stipulates that the local administrative committees are to be supervised by the party's provincial committees, and the Constitution makes all governors accountable to the party's Central Committee (Croissant and Lorenz, 2018). Therefore, Laos also has dual subordination where the People's Committee Chairmen of the country's 16 provinces and the Vientiane capital are given extensive responsibility and de facto autonomy over the implementation of economic policies (Keuleers and Langsy, 1999; Croissant and Lorenz, 2018).

Committee if the National Assembly, the Guidance and Inspection by the Government over the People's Councils, 1996; The Budget Law, 1996; Amendment to Law on the Organization of People's Councils and People's Committees, 2001; Land Law, 2001.

FIGURE 2: VIETNAM'S INSTITUTIONAL FRAMEWORK FOR WILDLIFE PROTECTION



Source: USAID *Saving Species* Legal Review

3.2.2 COMMERCIAL WILDLIFE FARMING REGULATIONS IN VIETNAM AND LAOS

VIETNAM

Dual subordination and incomplete decentralization play important roles in the persistence of the wildlife farmer loophole. Local authorities are tasked with the management of business operations through granting registration certificates and licenses and regulating the businesses (Anh and Chanh, 2015; Trinh et al., 2016; World Bank, 2016). Fees collected through business registration, licensing, and land acquisition and transfer applications serve as a major source of revenue for local governments (Malesky, 2008). This creates a financial incentive for local officials to quickly approve applications and tolerate regulatory infractions.

According to the 2014 Enterprise Law and 2013 Land Law,[16] all commercial wildlife farms in Vietnam must obtain two main documents to establish their operations: a business registration certificate from the Department of Planning and Investment (DPI) at the provincial level; and a land use certificate (LURC) from the provincial DARD or a verifiable long-term lease for the properties. Both certificates require several responsibilities on the part of the business owners. Holders of a business registration certificate must employ a licensed accountant and maintain a verified ledger of transactions that can be used in the calculation of value added taxes (VAT). For commercial farms, this means clearly documenting which animals are bred, purchased, and sold on business ledgers provided annually to the provincial tax authority. In the case of the LURC, local authorities can invalidate the document if the holders are not utilizing the land according to the terms of the application. The province could then take the land and reallocate it to other investors. For both of these standard documents, local authorities have ample legal room to regulate illegal wildlife breeding within their jurisdictions.

Farms involved in the commercial farming of wildlife also require several specialized permits for 1) the breeding and rearing of protected species; 2) the transportation of protected species; and 3) the import, export, and re-export of any protected species. Without these pieces of documentation, local authorities can penalize the owners. The multiple steps, separate licenses for individual activities, and associated wait times are not unique to wildlife farms and is found across many sectors in Vietnam. This need for multiple business entry steps is the reason Vietnam received a low ranking of 69th overall on Ease of Doing Business in 2018 in the World Bank's Doing Business Report (World Bank, 2018).

To further complicate this system, documentation for three specialized activities listed above are actually required by two different ministries simultaneously (MARD under Decree 32/2006/ND-CP and MONRE under Decree 160/2013/ND-CP) and are enforced by their subordinate local departments (DARD and DONRE). Both decrees provide regulations for the exploiting, transporting, trading, farming and importing/exporting of protected species. Table 2 summarizes the permits needed by commercial farms and the departments that issue them. Almost 70 percent of animals listed under the List of Species for Prioritized Protection (Decree 160/2013/ND-CP) overlap with those in the List of Endangered, Precious and Rare Species Group IB and IIB (Decree 32/2006/ND-CP).[17] Because the MONRE

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[16] More information is available online at http://vietnamlawenglish.blogspot.com/2015/05/vietnam-enterprise-law-2014.html.

[17] Throughout these decrees, "endangered" indicates species that are in danger of extinction but offers no legal protection from exploitation to them. However, the label "protected" does, and protected status is often, but not always, given to endangered species. Decrees offering protection to species are better able to legally limit wildlife trafficking and further conservation efforts.

legislation does not expressly make the MARD legislation subordinate, commercial farmers must operate under two separate legal regimes in order to be fully legal. That is, it is possible for a commercial farm to hold verifiable permits for its transportation and export by MONRE but still be contravening the law because it does not hold equivalent MARD documentation.

TABLE 2: LIST OF PERMITS REQUIRED OF COMMERCIAL WILDLIFE FARMS IN VIETNAM

LOCATION	PAPERWORK CHECKLIST FOR A WILDLIFE FARM
Provincial	Business registration certificate (from DPI) Land use certificate (from DARD)
Local (one each for MARD and MONRE)	Breeding license Transportation license Import and export permits

In Table 3, this problem is documented by showing which turtle species are protected under one decree but not the other in Columns 5 and 6. For example, the Indochinese Box has protection under MONRE and not MARD, while the Giant Asian pond turtle is protected under MARD but not MONRE.

TABLE 3: MODIFIED REPLICATION OF A TABLE FROM A TRAFFIC REPORT ON SOME TURTLE SPECIES PROTECTED BY LAW IN VIETNAM (ENV, 2018; MCCORMACK AND THUY, 2013)

VIETNAMESE NAME	ENGLISH NAME	SCIENTIFIC NAME	USES (PARTS)	DECREE 32/2006/ND-CP (MARD)	DECREE 160/2013/ND-CP (MONRE)	CITES APPENDIX	RED DATA BOOK OF VIET NAM 2007[18]
Rùa da	Leatherback turtle	*Dermochelys coriacea*	Luxury goods (shells) Food (meat)	Group IB	Yes	Appendix I	CR
Rùa đất lớn	Giant Asian pond turtle	*Heosemys grandis*	Luxury goods Food (meat)	Group IIB	No	Appendix II	VU
Đồi mồi dứa	Olive Ridley turtle	*Lepidochelys olivacea*	Food (meat, eggs)	Group IB	Yes	Appendix I	EN
Rùa hộp trán vàng miền Bắc	Indochinese Box turtle	*Cuora galbinifrons*	Suspected meat and shell trade	No	Yes	Appendix II	EN

[18] CR = Critically Endangered; EN = Endangered; VU = Vulnerable

TABLE 3: MODIFIED REPLICATION OF A TABLE FROM A TRAFFIC REPORT ON SOME TURTLE SPECIES PROTECTED BY LAW IN VIETNAM (ENV, 2018; MCCORMACK AND THUY, 2013)							
Rùa răng	Yellow-headed Temple turtle	*Heosemys annandalii*	Luxury goods (stuffed) Food (meat, eggs)	Group IIB	No	Appendix II	EN
Rùa hộp ba vạch	Chinese Three-striped Box turtle	*Cuora trifasciata*	Traditional medicine (shells) Food (meat) Pet	Group IB	Yes	Appendix II	CR
Rùa núi vàng	Elongated tortoise	*Indotestudo elongata*	Traditional medicine (shells) Food (meat) Pet	Group IIB	No	Appendix II	EN

The complex maze of registration requirements has created several problems that have allowed illegal commercial farming of wildlife to proliferate:

1. First, as noted above but important to reinforce, it is possible that even well-meaning commercial farmers may not be aware of all the required documentation, or they find the system unnecessarily cumbersome. Law-abiding commercial farmers must seek and receive approval from both MARD (via the CITES Management Authority) and MONRE (via the Provincial People's Committee) and follow two sets of procedures that are explained in two different decrees. As USAID *Saving Species* wrote in their legal review, "this makes it more difficult to do things legally than to do them illegally" (USAID Saving Species, 2017). According to data from the most recent Provincial Competitiveness Index (PCI), burdensome regulations like this are the reason why 45 percent of businesses and 44 percent of farmers believe that regulations are primarily used to extract bribes (Malesky et al., 2018). They are more likely to distrust the legitimacy of the regulations that govern farms and ignore them.
2. Second, the information gap and bureaucratic obstacles also impede law enforcers, prosecution agencies, and judges. If a commercial farmer, suspected of laundering trafficked animals, possesses only one license under either the MARD or MONRE system, local enforcement agencies are required to learn whether this is a simple oversight or a deliberate attempt to take advantage of the redundant legal regimes.[19] Moreover, to pursue a legal case against violators, enforcers and prosecutors must build cases in concert with two different agencies and two different systems of administrative records and data keeping rather than a single agency.
3. Third, overlapping laws and decrees lead some analysts to suspect that the confusion has created a lack of ownership on the part of enforcement agencies, leading to decreased effort and greater willingness on the part of perpetrators to flout the laws (UNDOC, 2015).

[19] Interview with Bui Thi Ha, Vice Director of Crime Hotline, Education for Nature Vietnam (ENV).

4. Fourth, the overlap is inefficient, dividing scarce regulatory and enforcement resources across two agencies. As the report will highlight below, resources could be better spent on technology for enforcement and training.

LAOS

The Wildlife and Aquatic Law/2007/NA provides the legal basis that governs commercial wildlife farming in Laos (Lüthi, 2012). Farms wanting to breed animals listed on the prohibited category of the Wildlife and Aquatic Law/2007/NA must receive authorization from the national office of the Ministry of Agriculture and Forestry (MAF). If the farm will be breeding animals in the management or general categories, authorization to establish a commercial farm can be obtained from the provincial and capital city agricultural and forestry divisions.

After farm owners receive authorization to establish a farm and breed animals, they need to obtain permits to house animals. The permit specifies the quantity and the type of animal that the farm can have. Permits for animals that are on the prohibited category list must be obtained through the central government. For animals that are on the management category list, the permission can be obtained from the MAF. For animals on the general category, farmers can obtain permits from the provincial and capital city agricultural and forestry divisions. Farmers have an obligation to regularly check for animal health, monitor for potential outbreaks of diseases, and treat infected animals immediately.

To transport animals, farms require different permits depending on the origin and destination of the animals (Phiapalath, 2016). For animals transported within a single district, the permit is issued by the District Agriculture and Forestry Office (Phiapalath, 2016). For animals transported across district lines but within a province, the Provincial Agriculture and Forestry Office issue the permit (Phiapalath, 2016). For cross-provincial trade, farmers have to contact the national MAF for permits (Phiapalath, 2016). For international trade, CITES authorization is necessary (Phiapalath, 2016). Transportation of animals that are on Appendix I of CITES requires permits of transport from both Laos and the destination country. For animals listed on Appendix II, farmers only need a certificate from the government of Laos verifying that the animals are captive-bred.

Similar to Vietnam, the establishment and registration needed to legally operate a commercial farm in Laos can be complex. This enables farmers to engage in illegal commercial wildlife farming.

First, confusion arises amongst farmers who lack direction on whom to contact to obtain authorization and permits. Farmers need one permit to establish a farm and another to specify the quantity of stock (Lüthi, 2012). Depending on the species they plan to breed, farmers may need to go to different offices to get appropriate legal papers as detailed above. Furthermore, farmers need permits to transport the animals. The fact that farmers need to go to different offices depending on the origin and destination sites complicates the commercial farm regulation (Lüthi, 2012). The complex process may increase the cost of obtaining legal permits and may drive some well-intentioned farmers to engage in illegal farming.

Second, the requirement of three different permits for a fully legal farming and trading business makes enforcement difficult (Phiapalath, 2018). Since the three permits may come from different offices and levels of government, enforcement officials may have to communicate with up to three different administrative bodies to access the permit records. This can increase the cost of enforcement for officials who often cannot discern between the various permits, eventually leading them to not enforce the laws at all.

3.2.3 CORRUPTION

Incomplete decentralization and overlapping authorities at the local level in both Vietnam and Laos have led to increased opportunities for corruption in the wildlife trade. For example, the coexistence of multiple documentation and under-resourced systems of regulation and enforcement permit malfeasance. Commercial wildlife farmers can take advantage of local agencies that are seen as vulnerable to bribery. They can also target places with the weakest enforcement to register across the multiple regulatory systems available to them (i.e. MARD v. MONRE) and search for vulnerabilities that allow them to identify the pathway of least resistance for their illegal activity (Lerner and Tirole, 2006).

In the Vietnamese wildlife commercial farming industry in particular, ENV reported that 14 out of 18 commercial farms admitted to paying informal fees, the Vietnamese euphemism for corruption, to the district FPD to continue their activities (ENV, 2018). In particular, the fees were used to obscure laundering by obtaining false permits, registering incorrect animal populations, and manipulating the official accounting of transactions. Moreover, farmers also sell transportation papers to each other. The risk of punishment for such activity is low and the costs are far below the potential profits from illegal activity. For instance, documents needed for pangolin trade can cost up to $157 for one pangolin and a falsified signature on a commercial breeding permit costs only between $225 and $450 (ENV, 2018). Such activities are common in the agriculture sector more broadly. In the 2017 PCI report, 29 percent of agricultural businesses claimed that they paid bribes during business registration, and a third of those said they initiated the bribe, as opposed to being asked or paying a customary facilitation fee (Malesky et al., 2018).

It is also important to recognize that police in Vietnam, who oversee the environmental police office, are widely thought to be among the most corrupt actors at the local level in Vietnam. Nearly one-third of companies surveyed for a nationwide survey presented at the Vietnam business forum noted that police officers expect gifts during meetings, and more than half of Vietnamese citizens consider most or all of the police to be corrupt. Furthermore, most businesses report that police services are unreliable at enforcing law and order. Critically, local police forces have significant degrees of discretion in their activities and are often able to act with impunity. The significance of this finding is that one of the key actors charged with enforcement necessary to close the farmer loophole may be contributing to its continuation (GAN, n.d.).

Similar corrupt actions are also found in Laos. Officials may choose not to conduct thorough inspections of farms, and farmers can pay officials to manipulate the record so that farm owners can bring wild-caught animals into the farm (Phiapalath, 2018). Record manipulation coupled with a weak registration system means there is not an accurate record on the number of animals in each farm (Phiapalath, 2018). This makes it easier for farmers to engage in wildlife laundering, as they can move wild-caught species in and out of the farm without official paper trails.

3.2.4 INFORMATIONAL GAPS

Beyond the legal and policy issues discussed above, there is the more widespread lack of biological knowledge and technological sophistication on the part of local enforcement agencies, prosecutors, and judges. This review identifies three major gaps impeding the successful enforcement and prosecution of traffickers posing as commercial farmers.

First, as noted above, there is severe confusion across the Vietnamese and Laotian legal systems regarding which animal species can be legally bred, traded, transported, and exported. In Vietnam, Decree 160/2013/ND-CP only provides protection for species afforded the highest level of protection (Category 1),[20] and it does not contain a second tier of protection for protected species, who are then subject to regulation and restrictions (Category 2 animals). These animals, which are listed under CITES Appendix II and Decision 82/2008/QD-BNN are delineated as Group IIB (Endangered, Precious, and Rare) under Decree 32/2006/ND-CP. For law enforcement officials, these complications have created a great deal of confusion as some erroneously believe that Decree 160/2013/ND-CP effectively replaced Decree 32/2006/ND-CP. By this standard, officials may not be enforcing the licensing requirements on endangered Vietnamese turtles.

Regulators in Laos are also stymied by knowledge deficits, and officials often issue permits for the wrong species. In Laos, there are gaps between the list of animals on the national Wildlife and Aquatic Law/2007/NA and on CITES Appendices I and II (Guegan, 2019). Since the Wildlife and Aquatic Law/2007/NA was passed in 2007, it does not cover as many species as the CITES Appendices I and II lists, which continue to be updated. When enforcement officials apprehend traffickers, they are unsure about which list takes precedence or which law should be applied. Prosecutors have had little success in prosecuting wildlife cases thus far. The inability to prosecute wildlife traffickers creates a feedback loop where the enforcement officials lose their motivation to enforce the law, because they believe that the traffickers will not be prosecuted.[21]

Second, even when law enforcement officials have been able to agree on which species have protected status, their ability to identify endangered species and their origin is impeded by limited biological knowledge and technology. Limited capacity manifests itself in failures to identify illegally farmed species, evaluate whether rare species are captured, and conduct onsite inspections.

Since many endangered species share morphologies with less critical species, it can be challenging for FPD and the environmental police to identify the protected species during farm inspections. For example, the camouflage of commonly bred Chinese Golden Coin turtle (*Cuora trifasciata*) as the rare Vietnamese Three-striped Box turtle (*Cuora cyclornata*) has allowed for the selling of imposters at inflated prices in both local markets and China (Nguyen et al., 2005).[22] While DNA testing has been able to identify the differences, the similarity in morphology between the animals' shells continues to confound local enforcers.

Local enforcement officials also lack the capacity to differentiate between wild-caught and farmed animals. Farm owners can easily lie to officials and say that the farm animals result from captive breeding instead of having wild origins (ENV, 2018). Some species, such as the Big-head turtles, should not be

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[20] Those listed under CITES Appendix I and under Decree 82/2006/ND-CP, Group IB Endangered Precious and Rare Species (under Decree 32/2006/ND-CP), and Prioritized Protection Species (Decree 160/2013).
[21] To address the gap between the two sets of laws, the Laotian government introduced a new penal code in 2018 (Guegan, 2019). The new penal code gives precedence to the CITES list over the Wildlife and Aquatic Law/2007/NA. As such, enforcement officials and prosecutors should refer to the CITES list for guidance. Any changes on the CITES list will be instantly recognized by the new penal code (Guegan, 2019). This simplification may help eliminate the confusion and make enforcement and prosecution easier in Laos.
[22] Also mentioned in interview with Tim McCormack of the Asian Turtle Program and Dr. Truong Quang Nguyen of the Institute of Ecology and Biology Resources (IEBR).

viable for laundering using such lies, as they cannot be bred in captivity. Nevertheless, 17 of the farms ENV visited had permits for raising these rare animals. Similar difficulties were identified in Laos (Phiapalath, 2018). One contributing factor to the lack of capacity amongst Laotian officials is their frequent turnover (Saypanya, 2018). Officials move to new departments that require different skill sets and thus lack the incentive to develop expertise in an area such as wildlife enforcement.

Finally, FPD officials also lack the knowledge on how to properly inspect and gather evidence on confiscated animals. The capacity to properly house, transport, or take samples from animals for further analysis and DNA screening is non-existent, and many officials worry they will accidentally kill the animals during inspection and subsequently face financial repercussions for accidental death (ENV, 2018). Enforcement agencies in Laos lack the financial capacity to purchase tools and equipment necessary for inspection (Guegan, 2019). Evidence gathering is thus a root contributor to their inability to conduct proper inspections, evidence gathering, and eventually prosecution.

It is also crucial to note that even if training is ideal and evidence collection is perfect, the Vietnamese legal system creates complications for the introduction of DNA evidence into courts. Only four scientific entities are officially designated as Scientific Authorities, meaning only they can provide scientific advice to the CITES Management Authority at MARD. They include: 1) Institute of Ecology and Biological Resources under Vietnam Academy of Science and Technology (IEBR); 2) Vietnamese Academy of Forest Sciences under MARD, 3) Research Institute for Marine Fisheries (RIMF); and 4) Central Institute for Natural Resources, and Environment Studies (CRES) at the University of Hanoi.[23] Of these, Decree 32/2006/ND-CP considers only IEBR and RIMF to be "Certified Examiners," which means only their DNA screening is admissible in a court of law and available for prosecution.

This institutional structure places enormous burdens on the operations and expectations of scientists in these units. Visits to CRES and IEBR demonstrated that the highly qualified and capable scientists are overwhelmed given the number of cases, which is beyond their human and capital resources. In 2017, IEBR was involved in over 150 cases involving the identification of 2,000 specimens. In 2018, IEBR was involved in 100 cases, which spanned 20 provinces and involved the identification of over 1,400 specimens. While most of these cases only required morphology or molecular assessments, DNA was used for a small portion.[24] Both IEBR and CRES experts also cautioned, however, that DNA screening was difficult and time-consuming for their outdated equipment, far more expensive than morphological assessments, and not yet fully applicable given that the DNA database lacks information on many species.

Laos does not currently have the capability to do DNA identification and has a similarly problematic legal system (Phiapalath, 2018). They lack staff with the scientific knowledge as well as the equipment for DNA identification. Even if enforcement officials can collect other types of evidence relevant to the thwarting of wildlife trafficking, the lack of coordination across agencies in the legal system makes prosecution unlikely. If enforcement officials from the MAF were able to apprehend traffickers and collect evidence, there are no clear guidelines on what the enforcement officials should do with the evidence (Saypanya, 2018). The enforcement officials may not file the right documentation, which makes it legally difficult to prosecute wildlife traffickers.

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[23] Decree 82/2006/ND-CP, Article 14.
[24] Interview with Dr. Truong Quang Nguyen, IEBR.

3.2.5 POVERTY

Not all commercial farmers are the hardened criminals that are depicted in the arrest data and news coverage of wildlife arrests discussed above. Many engage in commercial wildlife farming as means to provide for their families. While nations across the Mekong region have developed rapidly over the past few years, with Vietnam reaching middle income status, many places remain far from wealthy. Incomes in the agricultural sector, which includes wildlife farmers, remain the lowest in the population. Many low-income rural households have been known to supplement their incomes by capturing and trading endangered animals on a small scale.

According to the 2014 GSO Enterprise Census cited above, the median annual business income for the industrial category that includes wildlife famers (A0149) was 168 million VND ($8,000 USD). By contrast, the median income for agricultural businesses as a whole was 523 million VND ($25,000), manufacturing businesses made 2.4 billion VND ($114,285), and wholesale and retail traders made 2.1 billion VND ($100,000). Even within the category of livestock farming, wildlife farmers earn much less. Pig farmers (A0145) earn 1.4 billion VND ($69,500) and poultry farmers (A0146) earn 1.3 billion VND ($61,900).[25] Certainly, some of the low formal income of the wildlife farmers has to do with the lack of reporting of illegal activities. Nevertheless, it is clear that on paper, they rank among the lowest earning businesses in Vietnam.

Low incomes in wildlife farming confirms the high incidence of poverty generally in Vietnam.[26] According to the annual UNDP PAPI survey, roughly 53 percent of the households in the country derive their income primarily from farming, and these farmers report household incomes between 4 million and 6 million VND ($181-272 USD) per month. In comparison, unskilled workers in service or manufacturing in the same location report incomes of between 6 million and 8 million VND per month ($272-$363), with the national average being about 9 million VND per month ($409 USD) (CECODES, 2018). Poverty rates are higher in rural areas, particularly wildlife preserves, where many animals originate.[27] For instance, Dr. Minh Le traces the origins of the Vietnam pond turtle to several provinces in the South Central Coast ranging from the provinces of Da Nang to Phu Yen, the latter being a particular hotspot (Le and Sophat, 2018). According to the World Bank's poverty map, 59 percent of Phu Yen's population is employed in agriculture with 22 percent below the poverty line.

Not recognizing the relative poverty in the agricultural industry limits the range of solutions available. Investigations by groups such as ENV have tended to view commercial wildlife farmers as criminal traffickers and have recommended greater enforcement and punishment. Viewing the farmer loophole purely as a law enforcement exercise, however, has drawbacks. Enforcement is difficult, expensive, and must maintain consistent vigilance. If poverty is also a contributing factor, arresting and disbanding one rule-breaking farm may simply lead to others expanding or emerging to take its place. Enforcement increases the risks of engaging in illicit farming, but it does little to reduce the prospective reward.

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[25] Calculations by the authors.
[26] The PAPI survey does not differentiate between farmers who engage in raising livestock and those who raise cash crops, some may suspect that livestock farmers may be wealthier don average.
[27] See the World Bank's poverty mapping program (http://www5.worldbank.org/mapvietnam/) for an interactive map of poverty by district.

Ultimately, countering animal trafficking will require reducing demand for the endangered species and providing alternative sources of income that allow farmers to sustain their livelihood.

This motivation has inspired income substitution programs to wean farmers off the incomes produced by other illicit activities such as the trade in narcotics and endangered plants.[28] In a similar situation to that of wildlife trafficking in Vietnam and Laos, Reyes (2016) estimated that drug eradication programs in Colombia actually increased coca production (the source of cocaine) because new farmers replaced the displaced producers and recommended income substitution to deter the activity. However, rigorous assessments of income substitution programs in Afghanistan's opium production reveals only moderate success (6.5 percent decline) and suggests other efforts must be carried out concurrently (Greenfield et al., 2015).

Wildlife farming differs from drug production in that the eradication of the product is not the end goal; revitalization of declining animal populations is the ultimate objective. Stronger enforcement and arrests of commercial farmers does little to increase populations in the wild. Programs that help reintroduce rare animals back into the wild are necessary, and partnering with commercial farmers might better achieve this objective. In the Cayman Islands, for instance, the reintroduction of green turtles following captive breeding has been highly successful since it has led to the recovery of the species (Barbanti et al., 2019).

As described above, the legal regime is extremely complicated and information campaigns to educate and guide farmers have been limited. As of yet, there has not been a comprehensive analysis of all commercial farms to ascertain how much of the illegal activity is caused by insufficient knowledge, technological gaps, lack of capacity, and farmer behavior. How many farmers would be willing to engage in appropriate breeding techniques if they had access to technology and extension services to guide them on the proper procedures for raising animals?

One potential solution to the income gap is sustainable farming as discussed in more detail below, which would allow local farmers to be part of the solution. Sustainable farming consists of allowing farmers to raise and breed rare animals under heavily regulated conditions that ensure the safety of the animals. The farmers are allowed to sell a controlled portion of these animals on commercial markets to supplement their income, and the others are reintroduced back into the wild under the supervision of wildlife experts.

4. INTERVENTIONS AND EXPERIMENTS

This section introduces interventions to close the farmer loophole and outlines potential mechanisms to enable implementing interventions. These interventions best align with the interests and expertise of the PEER researchers. Turtles serve as a case study example for these interventions so that recommendations can contribute to resolving the Asian Turtle Crisis. However, all recommendations

[28] See Farell, 1998; Ven Wert, 1988; and Clemens, 2008 for a comprehensive review of these programs.

can be adapted to the situations for other wildlife threatened by the farmer loophole, including king cobras, crocodiles, civet cats, and macaques.

The most immediate intervention to close the farmer loophole is to correct the legislation that is contributing to the laundering of wildlife. This would include: 1) amending the Vietnamese Civil Code and Criminal Code to clarify which species can be farm raised and what equipment is required to successfully raise and breed them; 2) unifying the Vietnamese legislation so that only one legal regime applies to commercial wildlife farming; 3) streamlining the licensing and permitting procedures to reduce contradictions and complexity in this industry; and 4) issuing clear legal memoranda that inform local enforcement officials and farmers of their specific obligations under the law. USAID *Saving Species* and ENV have already moved these processes forward tremendously through their legal reviews and guidance documents. Although these have not yet been taken on board by policy-makers, the way forward is quite clear.

However, even if these changes are made, the commercial farming of rare and highly desired animals will persist because demand for rare animals is high in both Vietnam and China, and it continues to be an income generating industry for farmers. To help eliminate the challenges associated with the farmer loophole and align recommendations with the interests and expertise of PEER researchers, this report proposes three interventions aimed at addressing targeted problems: 1) a behavioral change intervention aimed at consumers of rare animal products to reduce demand in Vietnam; 2) a sustainable farming intervention that trains farmers on proper breeding, animal rearing, their legal responsibilities, and allows for some sale of wildlife to supplement incomes to address the supply side; and 3) an intervention to improve enforcement by completing the DNA barcoding for Southeast Asian turtle species and training enforcement officers and prosecutors on proper turtle identification using a clear, structured curriculum with identifiable learning goals. These interventions are also of interest because they align with the expertise of PEER researchers and are within the scope of PEER activities. Figure 3 below portrays the targets of the three types of intervention on the supply chain. Current and past interventions have been implemented in the three intervention types discussed. Table 4 below provides a summary of the past and current efforts for the three types of interventions in the Mekong region.

FIGURE 3: TURTLE SUPPLY CHAIN AND INTERVENTION TARGETS

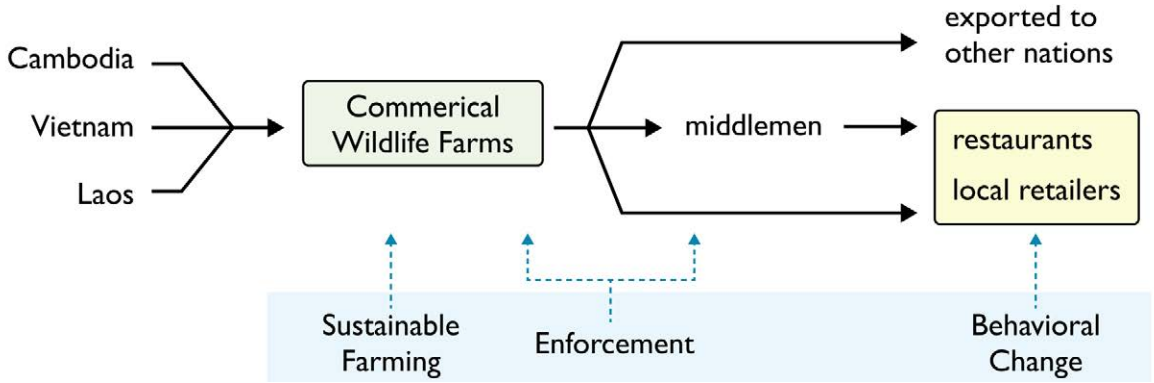

TABLE 4: PAST AND CURRENT INTERVENTION EFFORTS IN THE MEKONG REGION			
TYPE OF INTERVENTION	**IMPLEMENTING ORGANIZATION /ACTOR**	**FOCUS**	**SUMMARY OF INTERVENTION**
Behavioral Change	TRAFFIC	Target: domestic (Vietnam) and international Species: several species (e.g. pangolins, elephants, rhinoceros)	Market surveys to determine participants in illicit behavior Campaign targeting those participants with messages about the impact of consumption
Behavioral Change	USAID Wonders of Mekong	Target: domestic (Vietnam and Cambodia) Species: several endangered and rare species in the Lower Mekong region	Develop communication and media products to appeal to local decision-makers by connecting conservation to a country's national and cultural heritage Conduct training workshops to share knowledge on the sustainable management of the Mekong
Behavioral Change	USAID Wildlife Asia	Target: domestic (Southeast Asia and China) and international Species: elephants, rhinos, pangolins, tigers	Conduct targeted behavior change campaigns using social marketing Broadcast anti-trafficking messages via billboards, posters, online, and public service announcements
Enforcement	USAID Wildlife Asia	Target: domestic (Southeast Asis and China) and international Species: elephants, rhinos, pangolins, tigers	Create toolkit to help law enforcement officials identify and differentiate different species of pangolins Work with Asian governments and partners to help strengthen laws on wildlife trafficking Provide support to judges and lawyers in prosecution of wildlife cases
Enforcement	Asian Turtle Program and Dr. Minh Le	Target: domestic (Vietnam) Species: turtles	Expand the DNA database of turtle species and their origins as tools for use in enforcement
Enforcement	USAID *Saving Species*, Education for Nature – Vietnam, People and Nature Reconciliation (PanNature)	Target: domestic (Vietnam) Species: endangered species in Vietnam	Build capacity (e.g. increase the ability to identify species) via training programs for border guards, rangers, and customs officers Develop manuals and curriculum for enforcement training
Sustainable Farming	WCS, IUCN	Target: domestic (Vietnam and Laos) Species: Siamese crocodiles; Indochinese tigers	Successfully bred Siamese crocodiles in captivity and reintroduced them back to the environment

With all three interventions, we suggest using randomized controlled trials (RCTs) for evaluating the success of the interventions, and specifically outline research designs that deliver the most precise evidence of impact, effectiveness, and potential costs. Use of RCTs for these programs is necessary as all three suggested solutions are expensive, and contain high levels of uncertainty and, in some cases, controversy among subject matter experts. A rollout that experiments with each of the suggested interventions on a pilot basis is critical for rigorously documenting whether the interventions achieve their stated goals in a cost-effective manner without generating unanticipated secondary effects or behaviors that undermine the goals of the project. Only by comparing these interventions to control conditions, where no changes are made, can we document whether active intervention is preferable to taking no action. Moreover, only by comparing each intervention against the others in regard to their stated goals can we learn where USAID and other practitioners should channel their resources and efforts. Specifically, our RCTs aim to measure: 1) Does the behavioral change toolkit reduce demand and consumption of turtle products in Vietnam? 2) Does scientific and legal training of enforcement officers increase the number of apprehensions and prosecutions of turtle traffickers? 3) Will training on sustainable farming techniques lead to the substitution of wild-caught turtles with sustainably bred turtles in Vietnamese and external markets? Ultimately, we wish to learn which intervention or combination of the three interventions will do the most to rehabilitate Vietnam's dwindling turtle populations.

4.1 BEHAVIORAL CHANGE TO REDUCE DEMAND OF END-USERS

As discussed above, a key barrier to closing the farmer loophole is the positive demand for turtles from the Vietnamese and the Chinese. The high demand for turtles is tied to the beliefs that Vietnamese and Chinese hold regarding turtle consumption. To summarize, there are three main positive benefits that consumers derive from turtle consumption: 1) health benefits from consuming turtle parts; 2) status symbol recognition from consuming turtles as delicacies; 3) good luck from raising turtles as pets or using ornaments made from turtle parts. The high demand creates large profit margins that incentivize restaurant owners and souvenir shop owners to continue the sale of illegal turtles and their parts.

To target the demand-side problem that encourages the persistence of the farmer loophole, we propose a demand-reduction intervention for consumers of turtle meat and shells in restaurants and souvenir shops. We envision this being implemented by NGOs who have a strong command on local context and experience conducting similar campaigns as detailed further below.

Behavioral change interventions are efforts to change the behavior of a target group of actors in ways that lead to more socially desirable outcomes. Behavioral change programs are well-supported by psychological evidence, health programs related to public hygiene (e.g. hand washing and waste disposal), and anti-littering campaigns and have lately been adapted to address animal trafficking (Challender et al. 2014). The standard behavioral change toolkit involves seven steps: 1) detection of the target behavior that one would like to promote; 2) identification of priority participants in the behavior and actors influencing it; 3) discovery of the main drivers of the problematic behavior and constraints to altering in a more socially desirable direction; 4) creation of activities to change behavior; 5) implementation of the activities aimed at change; 6) evaluation of effectiveness; and 7) dissemination of results and scaled up interventions if necessary.

The design of a behavioral change program for reducing the demand of illegal wildlife products depend on local context and the scale of the behavior that is being targeted for change. In the past, both direct and indirect programs have been used to engender behavior change that reduces demand for wildlife products (Wallen and Daut, 2018). Indirect programs include those leveraging advertisements and public announcements to spread educational knowledge and raise awareness amongst consumers (Wallen and Daut, 2018). With this type of program, it is assumed that consumers lack information and new information is expected to induce the desired behavioral change. Of course, such programs will only be effective when the interests of the consumers align with those of the educational and awareness-raising efforts. An instance of success can be found in Saint Lucia, where awareness-raising campaigns led to a significant decrease in the demand for parrots (Jenks et al, 2010). A more direct approach to provide information to consumers is through outreach programs (Wallen and Daut, 2018). Outreach programs can include workshops and public education. Unlike indirect methods, this approach focuses on building relationships and trust among stakeholders to bring about collaborative behavioral change. For example, long-term outreach activities have successfully reduced illegal poaching in Thailand (Steinmetz et al., 2014). Another form of behavioral change program is through the use of social influence (Wallen and Daut, 2018). Social influence is when the change in behavior of one individual induce a change in behavior of another actor, intentionally or not. An approach that falls under this realm is public commitment by celebrities or regional leaders to not use or purchase wildlife products. Organizations such as WildAid and Education for Nature – Vietnam have taken this approach. The effectiveness of this approach, however, is not well understood yet and requires more in-depth research (Duthie et.al, 2017).

TRAFFIC, an INGO, has spearheaded the development of behavioral change toolkits for international trafficking in Vietnam and globally (TRAFFIC, n.d.). They have implemented a range of behavioral change campaigns to reduce consumption of pangolins, elephant tusks, and tropical timbers. In Vietnam, their *Chi* campaign is aimed at reducing the consumption of rhino horn (Interview with Traffic – Vietnam, 2018). They are in the early stages of this intervention but have implemented steps one through four of the toolkit (Ferguson and Nguyen, 2018). The *Chi* campaign conducted market surveys in major locations for trafficking of rhino horn powder and used survey data to determine that the main participants in the illicit behavior are upper middle-class businessman in the thirty to fifty-year-old age range. They are now partnering with the quasi-governmental Vietnamese Chamber of Commerce and Industry (VCCI) on a campaign to target these businessmen with messages about the impact of their consumption on the rhino population and the lack of scientific evidence for the virility and other health benefits attributed to rhino horn in popular culture and Chinese medicine (Ferguson and Nguyen, 2018). While leaders of the *Chi* campaign have attributed some early success to this program based on comparisons of self-reported behavior in two consumption surveys, it is hard to attribute the change to the campaign because of differences in sampling between the two instruments and a lack of precision about whether the behavioral change occurred specifically in the group of target recipients (Interview with Traffic – Vietnam, 2018). A separate evaluation of the predecessor program on rhino horn consumption was unable to attribute success to the program (Olmedo et al., 2018; Roberton, 2014). However, this program was based on post-hoc data collection and did not involve random assignment. Ultimately, the evidence on the success of behavioral change in Vietnam is quite limited and rigorous evaluation is necessary.

The behavioral change exercise proposed here would apply the behavioral change toolkit to turtle consumption in Vietnam. The intervention would raise awareness among restaurant owners, shopkeepers, and public consumers about the potential illegality of the turtle trade. Urban locales in Vietnam are appropriate targets because, second to China, these places are top end-use destination sites for turtle products (Olmedo et al., 2018). Focusing on turtles has some benefits over the *Chi* campaign in terms of ease of evaluation, because the population of consumers is bigger and represents several socioeconomic segments, allowing for more high-powered interventions with a broader reach. Second, there are more turtle product outlets in the country, allowing for easier identification of target populations.

4.1.1 THEORY OF CHANGE

To induce a behavioral change within the target audience to consume fewer turtle products, consumers should be informed about 1) consequences of the destruction of native turtle populations, 2) the loss of Vietnam's cultural heritage, and 3) purported health benefits. The decrease in demand for turtle products should lower the profit margins for farmers laundering turtles, and thus decrease their reliance on the farmer loophole.

4.1.2 OUTCOME AND IMPACT VARIABLE

The outcome variable will be the difference in the end-line market and consumer surveys between the treated and control sites. The campaign is expected to reduce the sales of target products in target outlets. The decline in consumption of turtle products is also expected. In the long run, the reduced demand would lower the profit margin for commercial farmers in turtle products. The lower profit margin will lead to a decline in laundering of turtles, which will in turn lead to a reduction in transportation and seizures of turtle shipments over time. Eventually, there will be an increase in the number of turtles in the wild due to reduced laundering. Along the way, we will also collect data on the cost of the campaigns in order to perform cost-benefit analyses.

4.1.3 INTERVENTIONS

This intervention will follow the seven-step behavioral change methodology outlined above in the Behavior Change introduction. First, the implementing partner should identify registered restaurants that serve turtle products in Hanoi, the capital with an urban population of over three million.[29] This can be done by using firm-level data from the Vietnamese National Tax Authority to identify restaurants that specialize in cuisines where rare turtles are likely to be features. High-end Chinese restaurants and restaurants that specialize in *nha que* (country) or *rung* (forest) cuisines will be studied first. Similarly, the implementing partner can use tax authority data to identify local shops to establish a list of specialty stores that likely produce turtle related products. Second, the monitoring and evaluation (M&E) team supporting the intervention and potentially led by Dr. Minh Le will conduct a market survey of these outlets to identify the distinct turtle product consumers and to confirm their reasons for buying. Given the widespread nature of turtle products, this group is expected to be highly representative of the Vietnamese people at large. Third, based on the profiles of shoppers at the outlets, the M&E team will conduct a baseline consumer survey of the target population. Fourth, the implementing partner can use

[29] The total population is 7.7 million.

the consumer survey to develop the behavioral change treatments. The implementing partner will need to run smaller focus group tests to fine-tune the messaging before broadcasting it publicly. Fifth, the implementing partner will coordinate with the M&E team on the design and roll out of a randomized control trial (RCT) to deliver the message to only certain parts of Hanoi through multiple print and online channels such as billboards, online ads, and flyers — the standard tools in behavioral change campaigns. Sixth, the M&E team will continue administering randomized consumer surveys at timely intervals (e.g. every six months) across the treated and control sites (on the several months scale) to assess the effectiveness of the marketing campaigns and capture self-reported consumption activity periodically. The M&E team should utilize the Vietnamese Household Living Standards or UNDP PAPI survey sampling frame to target individuals. Because survey responses can have little predictive power over the actual behavior of individuals, the M&E team should also monitor stocks and sales in restaurants and tourist shops as the actual behavioral response.

This program builds on the insights from the *Chi* campaign developed by TRAFFIC and funded by USAID that focused on the sale and use of rhino horn. While this intervention mainly targets turtles at large, it is possible to choose to target the campaign on certain species that are particularly prevalent in restaurants and shops, such as the Yellow-headed temple, the Asian soft-shell, and the Indochinese box turtles. The selection of species will be informed by the surveys and based on information already available. In the future, similar demand-reduction campaigns can be run for domestically consumed animals such as pangolins and slow lorises.

Besides the implementing partner and M&E research team, there are several other actors that must be involved in this intervention. First, it is important to consult a local marketing firm to assist in the messaging and its distribution. Second, the implementation team will need to include an NGO or organization whose interests align with the mission of saving turtles and who would have the capacity (in terms of staff, network reach, past success, etc.) to assist with the intervention. Some NGOs that the implementation team could collaborate with include Education for Nature Vietnam (ENV), TRAFFIC, and the regionally-based Asian Turtle Program (ATP). For example, TRAFFIC has been pioneering a behavioral change toolkit that is part of the USAID *Saving Species* program. Third, it can be necessary to partner with authorities at the national level such as the CITES Management body – the implementing body of CITES – for both legitimacy and support. We also recommend that implementers work with local government offices at either the provincial or district levels. We especially recommend working with the local Department of Planning and Investment (DPI) and Department of Industry and Trade (DOIT), who are charged with regulating business entry and market activity, respectively, and can help identify hot spots of commercial activity involving turtles. Partnering with VCCI will help improve access to local businesses and business data. With any behavioral campaign, the affiliation of the ad sponsor matters. Once the implementation team determines the target consumers, they could also partner with local civil society groups and researchers at academic institutions in the Greater Mekong to distribute behavioral change literature and gain legitimacy in the eyes of the public. These organizations would participate in distributing the behavioral change campaign materials and encouraging participation of vendors and consumers.

4.1.4 LOGIC MODEL

Table 5 below presents the preliminary logic model that identifies the expected resources and inputs necessary for the behavioral change campaign.

TABLE 5: BEHAVIORAL CHANGE LOGIC MODEL

RESOURCES /INPUTS	ACTIVITIES	OUTPUTS	OUTCOMES	IMPACTS[30]
1. Budget for four large-scale surveys and behavioral interventions	1. Baseline and endline market survey of restaurants, jewelry, and collectible stores in Hanoi	1. Estimated 300 managers of outlets receiving behavioral change campaign information; and 300 outlets receiving placebo campaign[31]	1. Reduced sales of turtle products in target outlets (measured by change in market survey and sales data, if available)	1. Lower profit margin for commercial farmers in turtle products
2. Trained enumerators to carry out surveys and deliver campaigns	2. Baseline and endline consumption survey of target population in Hanoi based on outcome of market survey	2. Estimated 1000 consumers receiving behavioral change campaign; and 1000 receiving placebo campaign[32]	2. Reduced consumption of turtle products in target products (measured by change in consumer survey, using shielded survey techniques to reduce social desirability bias)	2. Reduced "laundering" of rare turtles on commercial farms in Vietnam
3. Budget for printing of campaign materials	3. Creation of behavioral change informational campaigns focusing on destruction of native wildlife and scientific evidence on lack of medicinal benefits from turtle products			3. Reduced transportation and seizures of rare turtle shipments over time
4. Budget for production of high-quality videos to show to target populations				4. Increase in the number of turtles in the wild due to reduction in laundering

[30] The long-term impacts are sequential.

[31] According to the GSO Enterprise Census, there are currently 1,749 restaurants in Hanoi that are formally registered to sell cuisine that may include turtle meat (S5610). This number does not include informal restaurants and food stalls, but probably includes many businesses that do not have turtle on their menus. Conservatively, based on our local knowledge, we estimate about 10 percent are engaged in the trade (175). In the same dataset, we also identify 175 store that sell cultural products (I4761), 240 stores that sell Chinese medicinal products and other pharmaceuticals (I4772), and 576 retail stores that sell other specialized goods (I4773). Conservatively, we believe this would provide us with 125 outlets to work with. Basic power calculations, clustered by retailer (175) and restaurant (125), lead us to believe that a sample of 300 businesses is needed to identify a statistically significant effect.

[32] This is a power calculation based on Hanoi's adult and urban population of three million. Further research will be necessary to refine this calculation based on the number of shoppers at the identified outlets.

4.2 ENFORCEMENT THROUGH BETTER TRAINING AND TECHNOLOGY

As noted above, a key impediment to closing the farmer loophole is the lack of regulatory and biological knowledge among local enforcement officers and prosecutors. To summarize, there are three main information deficits: 1) inability to differentiate protected from unprotected species; 2) inability to identify protected species; 3) lack of knowledge about breeding and rearing needs of protected animals.

Several organizations have been working to fill in these gaps. The Wildlife Conservation Society (WCS) developed a species identification database built upon morphological characteristics, which has been transformed into an app for smart phones and made available to local police departments.[33] The USAID *Saving Species* program has also developed both digital and print versions of a pangolin identification kit. While these are extremely useful and easy for local enforcement officials to employ, they are limited when it comes to differentiating similar species or disentangling sub-species transported from neighboring areas. In these cases, more rigorous scientific information is required.

Dr. Minh Le of CRES at the University of Hanoi, a PEER Researcher and a biologist with expertise in Vietnamese turtles, has been an advocate of DNA databases as one potential solution to aid law enforcement (Le et al., 2014; Le and Pritchard, 2009). After screening a large number of animals, a database could be developed to hold critical mitochondrial DNA lineages to identify a wide range of animals, which practitioners refer to as DNA barcoding. Dr. Minh's tremendous progress on a DNA kit, known as the DNA tracker, can be found online.[34] According to Dr. Minh, DNA barcoding could be employed in two ways to aid law enforcement. First, local enforcement officials could take DNA samples of confiscated animals and animal products and send them in for screening in labs at the Centre for Resources, Environment Studies (CRES) and Institute of Ecology and Biological Resources (IEBR). Then they would be compared against the larger database, and researchers would be able to identify and report back to officials on whether these animals are protected species and detailed reports on the specific biological needs of the animals. For instance, the report could indicate whether these animals can be bred in captivity, how much space they need to prosper, and their food and hygiene requirements. Using this data, officials would be able to more easily identify and stop animal laundering at culpable farms. Depending on the lab's workload, this process can be done immediately or take up to several weeks. Second, Dr. Minh recommends using DNA barcoding as an investigative tool to identify trafficking hotspots. Confiscated animals would be screened, and their DNA barcode, combined with morphological, anthropological, and socioeconomic data, would help identify the geographical provenance of the confiscated animals. This would assist in targeting locations where trafficked or captive animals are raised or captured and facilitate the reintroduction of native animals after confiscations, if applicable.[35]

Building on work by the ATP, Dr. Minh tested this technique on the critically endangered Vietnamese pond turtle (*Mauremys annamensis*). ATP conducted 600 household interviews in the South Central Coast and collected 127 specimens during those visits. They then screened the collected specimens and traced their locations of origin across the region (Le and Sophat, 2018). Local law enforcement has also

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[33] Interview with Hoang Bich Thuy - Country Director, Wildlife Conservation Society: Viet Nam Program.
[34] Additional information is available at dnatracker.org.
[35] Interview with Dr. Le Minh, CRES.

involved Dr. Minh in a case of the Golden Chinese Three-striped Box turtle, where DNA evidence helped to successfully prosecute a wildlife trafficker.

While the possibilities of leveraging DNA barcoding are positive, Dr. Minh and other researchers point to several limitations. First, Dr. Truong from the Institute of Ecology and Biological Resources (IEBR) recognizes that the DNA barcoding will only be effective once a large number of species are screened.[36] Currently, the database has limited coverage, indicating that many confiscated animals are not included. Before implementation of more concrete downstream initiatives, funding is needed to both complete the database and expand the use of WCS's smartphone app on species identification. Second, current Vietnamese laws provide little opportunity for scientists to work with law enforcement officers (Le and Sophat, 2018). As noted previously, only four laboratories in Vietnam are officially designated as Scientific Authorities for Vietnam and only two laboratories are certified to conduct screening for court cases. While Dr. Minh's program at CRES is not certified for use in court cases, he often cooperates with IEBR. Third, funding for forensic scientific work is extremely limited or non-existent. On-site visits and interviews confirm that both CRES and IEBR are operating with outdated equipment that requires immediate upgrading and maintenance.

Leveraging the DNA tracker can help local officials identify turtle species and track geographic origins of traded animals. This intervention will be conducted in Vietnam as Laos does not have the capacity (e.g. personnel, technology, etc.) for such interventions. Dr. Minh Le's expertise also lies within Vietnam where he has strong relationships with many NGOs working on turtle conservation, including ATP. The targeted officials include forest police, environmental police officers, and government prosecutors, and the intervention will introduce them to a training curriculum that focuses on the morphology and DNA identification of species. The intervention will target the training program at the district level for both forest police and law officers and at the individual level for the prosecutors. The control group will receive a placebo training to reduce the possibility of Hawthorne effects,[37] where trained officials are more motivated to engage in enforcement. The implementing partner will work with the evaluation team to identify and roll-out the randomized control training treatments. The evaluation team will then monitor the effectiveness of the training by assessing cases of apprehensions and prosecutions and by checking whether officials contributed to the identification of the hotspots and trade routes of laundering activity.

It is important to note that previous efforts to train local law enforcement officials and prosecutors on improved DNA technology and increase their capacity have borne little success.[38] To date, no successful prosecutions of traffickers have involved DNA evidence collected by trained police officers.

However, the lessons learned from the unsuccessful efforts may guide a more focused intervention. Previous training programs have been unfocused and have lasted for short terms. The Vietnamese language training programs produced by animal protection groups show that they target local enforcement officials and prosecutors. The common approach is to invite a large number of presenters

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[36] Interview with Interview with Dr. Truong Quang Nguyen, IEBR.
[37] Hawthorne effect refers to the change in behavior of subjects in an experimental study due to the subjects' awareness that they are being studied.
[38] An exception may be the new USAID *Saving Species* Training Program at the Hanoi Police Academy, which is at its early stages.

from various backgrounds to a single destination for a one- or two-day training program. These experts then prepare presentations in their relevant fields (e.g., legislation on trafficking, morphology of animals, collecting field evidence, and DNA screening technology). Each presentation takes roughly 45 minutes with limited question and answer sessions between the speaker transitions. On paper, the presentations are excellent and serve as instructive tools. However, we believe previous efforts have been hampered by several problems. First, many of the presentations are highly technical and utilize academic jargon that many district policemen may not comprehend. Second, the curricula are poorly focused and introduce training from legal analyses to biology. The trainings fail to advance didactically through the material and lack measurable learning objectives. Third, they cover a wide range of animal species, from global charismatic animals (e.g. pangolins, elephants, and rhinos) to Vietnamese specific creatures (e.g. bears, slow lorises, gibbons, crocodiles, snakes, and turtles). Upon reviewing the training modules, it is hard to see how an official would be able to use this information to solve the identification problems outlined above. In the training program that we outline below, we attempt to account for these deficiencies.

One final note is that previous training programs have not been subject to rigorous evaluations of the outputs or final outcomes. There is scarce data on whether techniques from the training programs were used in enforcement and prosecution and whether there were any successful prosecutions of the specific animals upon which the officials were educated.[39]

4.2.1 THEORY OF CHANGE

Enforcement officials trained on the morphology and DNA identification will be able to detect the origin of farmed animals and distinguish among different species and lineages. This will allow them to determine which animals are trafficked and which animals are legally bred on commercial farms. The skills and information from the training will provide the officials and prosecutors with evidence to arrest and prosecute farmers who take advantage of the farmer loophole. When used effectively, one should see increased reported arrests and prosecutions of traffickers, especially those operating out of commercial farms. Stronger enforcement can then deter farmers from engaging in wildlife laundering and lead to a reduction in the number of turtles laundered through the loophole by increasing the costs of trafficking.

A key assumption of this theory is that corruption can be avoided or limited so that it does not undermine the motivations of local enforcement officials. One way to address this assumption would be to include a behavioral change component to the training that motivates officials and police officers to cooperate successfully by appealing to nationalism and Vietnam's cultural values. Although it is beyond the scope of current recommendations, this behavioral change proposal for officials could also be subject to randomized evaluation.

4.2.2 OUTCOME AND IMPACT VARIABLE

To monitor this intervention's outcomes, the M&E team will track apprehension and prosecution cases. The team will then analyze information on the types of apprehension, the total number of cases, the number of turtles reported, and actual prosecutions. Additionally, they should conduct textual analysis of legal reports to identify where, how often, and what specific information from training content and

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[39] Many interview respondents mentioned more specific training programs, but unfortunately, the Vietnamese-language versions of these materials were not provided despite several requests.

the DNA database was utilized and recorded. At the same time, the team will collect accurate financial data on the costs of the intervention during the pilot. This will allow for a complete cost benefit analysis and inform whether the project should be scaled up or not.

The higher expected costs from laundering due to the higher risk of getting arrested and prosecuted will lead to the reduction of laundering of turtles in commercial farms. With the reduction in laundering, there will be less transportation and seizures of turtle shipments. Eventually, we will see an increase in the number of turtles in the wild due to the decline of turtle laundering.

4.2.3 INTERVENTIONS

The interventions entail strengthening enforcement by introducing new training curriculum to forest police, law officers, and prosecutors. As mentioned previously, this training relies on the DNA database for turtles created by Dr. Minh Le as well as a database on morphology across the many turtle species. The implementing team will equip officials with DNA barcoding technology so they can capture data on species they encounter. Together, the DNA and morphology databases will form a toolkit that will help enforcement officials identify where the species in farms or other confiscations come from and whether the animals in surveyed farms are bred legally or caught in the wild. There is often confusion on whether a captured animal is part of the CITES list or not, so the DNA barcoding will help tackle this prominent challenge.

However, before the intervention is instituted, it is recommended that the implementing team conduct additional research to complete an inventory of the wildlife farms and their locations. This information will be crucial to the success of this enforcement intervention and the sustainable livelihood intervention discussed later. As part of this additional research, the implementing team should assemble data on registered farms and locate them on a GIS map.[40] As noted above, our analysis of the GSO survey identified only 57 firms that are registered to engage in wildlife farming, which excludes wildlife farms operating informally, illegally, or without the full set of registration documents. Therefore, additional resources will be needed to search and screen multiple databases including the National Tax Authority Database, the Ministry of Planning and Investment Registry, and the list of MARD and MONRE licenses granted. With some effort, this information will more reliably show the density of farms across the country and allow the implementing team to identify farms across districts that can be placed in the treatment and control arms of the intervention.

After the districts are identified, the implementing team should coordinate with MONRE, MARD, and the police departments - entities that have worked together previously - to carry out the intervention across the randomly treated sample. We especially recommend working with the Vietnamese National Academy of Public Administration (NAPA), which has regional offices and the official mandate to provide administrative job training and continuing education for Vietnam's 200,000 bureaucrats. They would be very willing to design a curriculum on legal training and enforcement. The Vietnam Police Academy, based in Hanoi, could also serve as a partner for this training, and would likely be able to better situate this enforcement program in a general curriculum on anti-trafficking. Of course, the organizations would need to be willing to cooperate with the project, but other organizations have managed these collaborations before. The implementing team can partner with the ATP as they have

[40] Additional information is available online at https://www.gso.gov.vn/default_en.aspx?tabid=514&idmid=5.

been working on detailing the morphology of different turtles and are producing guidebooks that the implementing team may want to use as a part of the curriculum. In developing a curriculum, the implementing team can work with USAID *Saving Species*, which is supported through USAID. USAID *Saving Species* has been working with ministries and departments in developing training curriculums and training manuals for enforcement officials for elephants, pangolins, and rhinoceros. They should consult with ENV to gather information on how many cases have been prosecuted and which ones used the DNA barcoding or morphology databases. Dr. Seak Sophat, a PEER researcher and a biodiversity conservation specialist at Royal University of Phnom Penh in Cambodia, could also help evaluate the training curriculum. Once the baseline training kit is created, the implementing team should begin by running small focus groups to fine tune the program. All members of the treated group, including the forest police, law officers, and prosecutors will be trained with the same toolkit, while the control group will receive a placebo training on standard evidence collection in order to avoid introducing a Hawthorne effect. If the implementing team finds the frequency of the training to be inadequate for learning, the investigator can add a "high treatment" arm, where those officers and prosecutors receive more frequent training and/or receive encouraging messaging to make use of the toolkit. The M&E team will then monitor all treatment and control groups at timely intervals on the outcome variable.

Currently, the DNA database captures information on only some turtle species that are part of the illegal trade. Dr. Minh Le, the PEER researcher in Vietnam, wants to expand the database to include other turtle species and animals such as snakes and crocodiles, which can then be used to strengthen enforcement and expand conservation efforts in the Greater Mekong. Challenges to the expansion and use of the DNA database include: 1) the current state of technology, 2) the cost of the equipment in Vietnam, and 3) the willingness and ability of prosecutors to use this information to enforce existing laws. The implementing team may also want to work with Dr. Truong at IEBR, one of the main laboratories in Vietnam that provide screening evidence in court cases. Partnering with institutions like IEBR could improve the use of forensics as a tool for wildlife identification.

On the legal side, the implementing team may want to work with USAID *Saving Species* and People and Nature Reconciliation (PanNature). USAID *Saving Species* can provide support on improving laws and regulations that address the farmer loophole and ensure that different decrees and laws are in alignment. PanNature can assist in the review of relevant legislation and identify gaps in the legislation (Nguyen, 2018). PanNature can also help with communicating with and clarifying the legislation for different stakeholders, including the media where it has excellent relationships (PanNature, n.d.). Their ongoing work would be useful in ensuring that the Vietnamese Civil Code and Criminal Code agree on which species can be farm-raised and aligning domestic legislation with the CITES appendices.

4.2.4 LOGIC MODEL

Table 6 below presents the preliminary logic model that identifies the resources and inputs that will be needed for the enforcement intervention.

TABLE 6: ENFORCEMENT LOGIC MODEL				
RESOURCES /INPUTS	ACTIVITIES	OUTPUTS	OUTCOMES	IMPACTS[41]
1. Budget for DNA trackers, WCS phone app, and new DNA screening equipment to expand the DNA database (specifically for relevant turtle species) 2. Budget for hiring and training teachers or experts to conduct training programs. 3. Budget for new and improved training materials such as manuals and videos 4. Budget for research and travel across the country's districts to identify farms	1. Training forest police, environmental police, and prosecutors 2. Creating curriculum and training materials on how to identify species and utilize the information in cases 3. Surveying officials on the use of training and DNA trackers at regular intervals	1. Estimated 50 - 75 districts receive training on DNA identification and morphology with 50 - 75 control districts[42] 2. May have an additional treatment group that receives "higher dose" of training chosen from within the treatment group above.	1. Increase in the use of DNA identification and morphology techniques taught in the training by enforcement officials and prosecutors 2. Increase in the number of cases of turtle trafficking as well as the number of apprehensions of turtle traffickers 3. Increase in the number of prosecutions on cases that involved turtle trafficking	1. Increased costs to launder turtles due to the higher risk of getting arrested and prosecuted 2. Reduced laundering of rare turtles on commercial farms in Vietnam 3. Reduced transportation and seizures of rare turtle shipments over time 4. Increase in the number of turtles in the wild due to reduction in laundering

4.3 SUSTAINABLE FARMING TO INCREASE INCOMES OF WILDLIFE FARMERS

As mentioned above, obstacles to successful sustainable farming include low incomes and lack of knowledge among the farmers. Low incomes have prevented farmers from obtaining the necessary equipment that are vital to successful breeding. Farmers also lack the knowledge of both the necessary permits needed for legal farming as well as the knowledge of proper breeding techniques.

Low incomes in rural areas may fuel the proliferation of commercial wildlife farms and openness to participate in the wildlife trafficking value chain. One potential solution is sustainable farming, which would enable local farmers to be part of anti-trafficking and wildlife conservation solutions. Sustainable farming consists of allowing farmers to breed and raise species that survive in captivity under heavily regulated conditions that ensure the safety of those animals. The farmers are then allowed to legally sell some of these animals on commercial markets to supplement their income, while others are reintroduced back into the wild under the supervision of wildlife experts.

[41] The long-term impacts are sequential.
[42] This number is preliminary based on conjectures about the location of farms from ENV's survey. More precise estimates will be necessary before moving forward.

In the conservation community, sustainable farming has begun to win some prominent advocates, even if it remains controversial for others. Dan Challender and Douglas C. MacMillan, two well-known wildlife trade researchers, argue in the journal *Conservation Letters* that regulation and enforcement cannot end the poaching crisis alone. They suggest that "in the medium term, we should drive prices down with sustainable off-take mechanisms" such as regulated trade, ranching, and wildlife farming (Challender and MacMillan, 2014). In particular, they point to the successful introduction of crocodile ranching that reduced poaching and rehabilitated populations "even in countries with weak governance." Other researchers have attributed wildlife farming with the successful recovery of mountain zebra subspecies, black wildebeests, white rhinos, and bontebok and sable antelopes in Africa (Taylor et al., 2016). In Vietnam, the FAO report recognizes the difficulty of eradicating commercial wildlife farming and called for better support including: a national wildlife farm registry, better training of farmers in food safety and disease prevention, and development of regular veterinary care (FAO, 2014).

Laura Tensen (2016), a conservation geneticist at the University of Johannesburg, however, challenged these optimistic stories with a broad review of commercial wildlife farming. She argued that the efforts rarely work either because farming is always more expensive than hunting, which raises prices beyond which consumers are willing to pay. Drury (2009) in a qualitative study in Hanoi also warned that commercial farming might simulate demand for rare products. Still, Tensen recognizes Asia as an exception where consuming rare wildlife is widely perceived as a status symbol, a hypothesis reinforced by survey evidence collected by USAID Saving Species (2018) on rhino horn use. Tensen (2016) cites several criteria for successful sustainable farming of commercial wildlife, which could be successfully adapted to the Vietnamese context:

1. The farmed product must be an adequate substitute to its wild counterpart for potential buyers.
2. It must supply a substantial portion of the market and not increase demand by making the product more popular or legitimate.
3. It must be more cost efficient so as to avoid being undersold in the black market. Among other requirements, this would mean that the farmed animals be predisposed to thrive in artificial environments, have a high rate of reproduction, and subsist on relatively little feed to maintain low variable cost.
4. Farmers cannot rely on restocking from the wild.

If handled with proper training and resources, several Vietnamese turtle species, such as the Vietnamese pond turtle and Yellow-headed Temple turtle, would meet these criteria.[43] Sustainable farming would allow for the replenishment of some of the lost *Wonders of the Mekong* and provide a suitable living for struggling households. In Vietnam, sustainable farming has been successfully applied to Siamese Crocodiles, where farms have used them as tourist attractions (Jelden et al., 2008; Tosun, 2013). Laos has also been successful at breeding Siamese Crocodiles in captivity and reintroducing them back into the wild (WCS, n.d.). Specifically, 40 wild crocodile eggs were successfully hatched in captivity, and some were reintroduced back into the wild in 2013. Recently, IUCN in Vietnam has even proposed a

[43] Please see the Appendix for more details.

sustainable farming program for the endangered Indochinese Tiger in Vietnam's Central Highlands (IUCN Vietnam, 2014).[44]

This section proposes an intervention that will promote sustainable farming of turtles. The intervention would introduce proper breeding techniques and equipment that will help farmers successfully breed turtles at a cost lower than that of capturing turtles from the wild.

4.3.1 THEORY OF CHANGE

With proper breeding equipment and knowledge, farms that intend to engage in legal turtle breeding will change their behavior and no longer replace farmed animals with wild-caught animals. Greater knowledge and proper equipment should also lower the cost of breeding to the point that is cheaper to breed turtles rather than to launder them illegally. With this change in relative cost, the farmer loophole can be closed.

4.3.2 OUTCOME AND IMPACT VARIABLE

The outcome variable will be whether the farm can maintain a continuous breeding program with proper care for the farmed animals and without reverting to laundering. Aside from measuring the success of proper breeding, the M&E team will have to track the number of healthy individuals produced and assess whether the farms report the number of animals accurately. In the long run, the cost of proper breeding will be lower than the cost of laundering. This will reduce the occurrences of turtle laundering in commercial farms, and we will observe reduced trafficking and fewer seizures of illegal turtles over time. Eventually, this will also revitalize wildlife populations.

4.3.3 INTERVENTIONS

The intervention will be done at the farm level. First, the implementation team should identify all of the wildlife farms registered in Vietnam and map them regionally. They should be categorized by species raised and any other important differentiating criteria. They should then screen them to see whether they meet two criteria: 1) the farm must be raising turtles and 2) the farm should have the intention to engage in proper breeding. Both are necessary to change farmer behavior. Second, the implementation team will randomly assign the farms that meet the criteria into a treatment and control group. The treatment group will receive training on proper breeding techniques and on how to obtain legal permits from the authorities as well as subsidized breeding equipment. The control group will receive neither but will receive a placebo treatment to avoid Hawthorne effects as defined above. Research on endemic turtle species at the Me Linh Station for Biodiversity in Hanoi found that among other things, proper breeding equipment includes connected indoor and outdoor enclosures for quarantine and husbandry practices (Ziegler et al., 2016; Nguyen et al., 2012). The implementation team should consult with the veterinary managers and researchers at ATP to learn about which species can be bred and which facilities they require. The M&E team should also consult with Dr. Seak Sophat in assessing outcomes. Care should be taken to identify which turtle species can be bred (e.g. big-headed turtles cannot be bred in farms).

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[44] Interview with Jake Brunner, IUCN, where he showed us the proposal, "Restoring a Viable Tiger Population in Vietnam," July 2014. Page 3 specifically mentions engaging wildlife farmers in capacity building and reintroduction.

Once the intervention is initiated, the M&E team should check-in on the farms over time to collect measurements on the outcome variables. This should be done between six months or one year after the installation of equipment. Eventually and under supervision, the animals that have been bred properly in the farms can be reintroduced into the wild to revitalize the population of endangered species. The M&E team should also monitor and partner with local NGOs and law enforcement to inspect all farms not part of the program to collect data on illegal breeding. While this intervention targets turtles, it is possible to apply the same intervention to other species that are capable of being bred in captivity such as Malayan porcupine, masked palm civet, and several snake species.

While the farmers are the main actors in this intervention, the implementation team should involve several other partners. Local NGOs, such as WCS and ENV, can provide training on proper breeding practices to the farmers and have expressed interest in sustainable farming. Local officials from DARD and DONRE should also be included as potential partners, as they can brief farmers on which species can be bred and transported legally. DARD, in particular, manages a wide array of agricultural extension programs. If the suggested intervention program were designed as an extension service, it could make use of their existing training and distributional capacity. Since funding is a significant input for this intervention, the implementation team should also engage with NGOs and international partners and funding sources such as TRAFFIC and IUCN to help secure funding for the equipment. This intervention can also engage Dr. Sengdeuane Wayakone, the PEER researcher in Laos who has an interest in sustainable livelihoods and has expertise in environmental impact analysis. Specifically, he may be able to conduct an analysis on how the reintroduced species interact with their habitats and whether the reintroduced species are able to integrate into the new settings. Still, one impediment to the intervention may be that there is a much stronger demand in China for wild turtles over farmed counterparts (Rocheleau, 2017).[45] If the farmed turtles from successful breeding programs are not able to meet the high demand for wild turtles in China, the laundering of endangered species may continue.

4.3.4 LOGIC MODEL

Table 7 below presents the preliminary logic model that identifies the resources and inputs necessary for successful farming of turtles.

[45] Addressing Chinese demand was specially ruled out of the scope of our project. However, success in reducing wildlife trafficking will ultimately demand including Chinese stakeholders as part of a broader, regional program.

TABLE 7: SUSTAINABLE DEVELOPMENT LOGIC MODEL FOR TURTLE FARMING				
RESOURCES /INPUTS	ACTIVITIES	OUTPUTS	OUTCOMES	IMPACTS[46]
1. Budget to subsidize proper breeding equipment 2. Budget for a training program to teach farmers how to successfully breed animals in captivity and how to obtain permits from authorities 3. Budget for monitoring the breeding activities of farmers and their progress 4. Budget for program that reintroduces species back to the wild	1. Identify and categorize all the wildlife farms in Vietnam. Screen the farms for those raising turtles and have an inclination to adopting proper breeding. Draw a random sample from farms to create treatment and control groups for evaluation. 2. Create a training program to train farmers on proper breeding 3. Once healthy animals can be bred and raised on farm, attempts can be made to reintroduce those turtles back into the wild.	1. Training for farmers in the treatment group on how to properly breed eligible turtles in farms. Control group does not receive any training on breeding, but receives a placebo treatment on business planning. 2. Provide subsidies to help farmers in the treatment group purchase the necessary equipment for proper breeding. Control group does not receive a subsidy.	1. Farm can maintain a continuous breeding program 2. Reduction in the number of wild-caught animals being brought into the farms. Increase in the number of farmed turtles. 3. Improved accuracy on the number of animals in the farm	1. The cost of proper breeding is lower than the cost of animal laundering 2. Reduced "laundering" of rare turtles in commercial farms across Vietnam 3. Reduced transportation and seizures of rare turtle shipments over time 4. Increase in the number of turtles in the wild due to reduction in laundering and the reintroduction of species into the wild.

5. CONCLUSION: POTENTIAL FOR IMPACT

The U.S. government has made ending wildlife trafficking a high priority with the Congress Eliminate, Neutralize, and Disrupt Wildlife Trafficking Act of 2016 (END Wildlife Trafficking Act). The interventions described in this report will contribute to protecting the biodiversity of the Mekong countries through mitigating wildlife trafficking. From a scientific perspective, protecting the biodiversity of the Mekong countries and hence contributing to the goals of the *Wonders of the Mekong* initiative requires halting the illegal trade in wildlife. Doing so requires a multi-pronged effort to influence both the suppliers and consumers of wildlife, but also through improving law enforcement and supporting sustainable local livelihoods. No one of the recommendations put forth in this paper in and of itself will bring an end to the illegal trade in wildlife in the Mekong, but rather by highlighting the different political economy aspects of the farmer loophole, the recommendations together offer different interventions to be deployed along the supply chain to curb the laundering of turtles.

To abate wildlife laundering in the Mekong, one must thus build the capacity of law enforcement officials as well as other government and non-governmental actors in the Mekong through information training and innovative tools. These advances include disseminating and utilizing the DNA barcoding tool developed by Dr. Minh Le that helps monitor and enforce legal wildlife trade. It also provides an important opportunity for the sharing of knowledge across institutions vested in combating wildlife trafficking. The expertise of other PEER researchers such as Dr. Sengdeuane Wayakone in impact analysis and Dr. Seak Sophat in biodiversity conservation should be leveraged across the interventions. Efforts are also already underway by other NGOs in Vietnam (supported by USAID) to examine and

[46] The long-term impacts are sequential.

promote norm changing behavior. These parallel projects offer opportunities to further explore the drivers of the illegal wildlife trade, understand the changing demand and supply chains, and examine the role farms play in the laundering of certain wildlife species. The efforts should be coordinated as much as possible to build synergies for impact.

Another important outcome of the proposed interventions is the improved knowledge and evidence base. Stakeholders currently working on wildlife conservation and protection operate in a data poor environment. There is an absence of accurate data on the volume of wildlife products traded, legally and illegally, and wildlife stockpiles within countries (Interview with Traffic – Vietnam, 2018). Similarly, most current projects are not using state of the art evaluation techniques to test the success of their reform ideas and interventions. As such, improving enforcement and supporting sustainable farming vis-à-vis better licensing and registration may help to address the lack of information on and transparency about wildlife trade (Nijman, 2010).

APPENDIX 1: TURTLE SPECIES

The following list reports turtle species that are traded in Vietnam with information on their conservation status and consumer pricing listed if available.

CHINESE STRIPED-NECKED TURTLE (MAUREMYS SINENSIS)

The Chinese striped-necked turtle is indigenous to northern Vietnam. The species can be found in freshwater environments with large amounts of vegetation such as swamps, canals with muddy bottoms, rivers, riverbanks, marshes, and muddy ponds. The Chinese striped-necked turtle is listed as endangered by IUCN and is on Appendix III on the CITES list (ENV, 2018). This species is farmed in Vietnam, with farm owners needing permits from the Provincial Forest Protection Department (FPD). These animals are being sold in markets for rates from $3.64 to $22.73 per turtle (Thong et al., 2019).

INDOCHINESE BOX TURTLE (CUORA GALBINIFRONS)

The Indochinese box turtle is an indigenous species that lives in evergreen rainforests in Northern Vietnam (Stanford et al., 2018). This species still exists in the wild but is being poached heavily and traded to China. Indochinese box turtles are typically anxious in captivity, and while successful breeding is rare, it is increasing worldwide. There are around 1,500 specimens in captivity worldwide (Stanford et al., 2018). The Indochinese box turtle is priced between $56 and $190 per turtle (Thong et al., 2019). This species is listed on Decree 160/2013/ND-CP (Thong et al., 2019). Illegal traders can face sentences of up to three years in prison if caught with specimens of this animal.

BOURRET'S BOX TURTLE (CUORA BOURRETI)

Bourret's box turtle is native to Vietnam, but overhunting has greatly decreased the population size of this species in the wild (Horne, Poole, and Walde, 2011). Bourret's box turtle is considered one of the 50 most endangered turtle species in the world (Stanford et al., 2018). The main use of Bourret's box turtle is for food and medicine. The species is heavily poached and traded to China. It can become easily stressed in captivity, and while farmers have been more successful in breeding them recently, successful breeding is still thought to be rare (Stanford et al., 2018). As such, most turtles sold from farms are likely from the wild rather than being bred in captivity. The species is on the IUCN critically endangered list and CITES Appendix II (ENV, 2018). The price of Bourret's box turtle is found to be between $36 and $109 per turtle (Thong et al., 2019).

VIETNAMESE POND TURTLE (MAUREMYS ANNAMENSIS)

The Vietnamese pond turtle is native to central Vietnam and is considered one of the 25 most endangered turtle species in the world (Horne et al., 2011). The species is considered to be extinct in wild (USAID Governance for Inclusive Growth Program, 2016). This is in large part due to much of its habitat being destroyed for paddy fields and because of high demand for its blood as traditional remedy for heart diseases (Horne et al., 2011). This species, however, is still being farmed in large numbers in Vietnam (Stanford et al., 2018). Although these turtles do exist in farms and are not headed to extinction, they have not yet been successfully reintroduced in the wild. Multiple generations have been raised in captivity and bred selectively for traits to help them survive better in this environment. They are known to live and breed well in farms, but these traits might not translate well to survival in the wild. Having a large number of Vietnamese pond turtles in farms reduces the price of the species greatly (Stanford et al., 2018). The species is on the IUCN critically endangered list and CITES Appendix II (ENV, 2018), and is protected under Decree 32/2006/ND-CP in Vietnam (Thong et al., 2019).

BIG-HEADED TURTLE (PLATYSTERNON MEGACEPHALUM)

The big-headed turtle is a species native to Vietnam and considered to be close to extinct in the wild (Stanford et al., 2018; USAID Governance for Inclusive Growth Program, 2016). The big-headed turtle is in high demand both in the international pet market and in food markets (Horne et al., 2011). There is an increase in trade for the brightly colored hatchlings of the big-headed turtle, with the hatchlings demanding higher prices than adults due to their vivid colors. Farmers have claimed that they can raise big-headed turtles in farms, however, most specialists agree they cannot be raised in captivity. It is unlikely that the turtles being sold are from captive breeding. It is more likely that they are being removed from the wild and imported illegally from Cambodia before being legalized through farms (Dung and Ha, 2018). The species is on the IUCN endangered list and CITES Appendix I (ENV, 2018). The species can be sold at $50 to $80 per turtle (Thong et al., 2019).

GIANT ASIAN POND TURTLE (HEOSEMYS GRANDIS)

The giant Asian pond turtle is indigenous to southern Vietnam and lives close to rivers, swamps, lakes, and ponds (Lintner, Weissenbacher, & Heiss, 2012). Giant Asian pond turtles are on the IUCN vulnerable species list and are on Appendix II on CITES list (ENV, 2018). This species is part of Decree 32/2006/ND-CP in Vietnam (Thong et al., 2019). Anyone who is caught illegally trading this species can be sentenced to up to three years in jail. There are farms for giant Asian pond turtle in Vietnam. The species is sold at around $25 per turtle (Thong et al., 2019).

YELLOW POND TURTLE (MAUREMYS MUTICA)

Yellow pond turtle is a species that is indigenous to northern Vietnam (Iverson & McCord, 1994). Yellow pond turtle is listed as an endangered species by the IUCN and is on Appendix II on CITES (ENV, 2018). This species is known to be illegally traded at high volume (Horne et al., 2011). There are yellow pond turtle farms that sell turtles for $13 to $40 each (Thong et al., 2019). The price for the yellow pond turtle has remained stable over time because the turtle farms in Bac Ninh and Thanh Hoa provinces farm this species in large quantities (Linh et al., 2016).

YELLOW HEADED TEMPLE TURTLE (HEOSEMYS ANNANDALII)

Yellow-headed temple turtle is a species that is native to Vietnam (Horne et al., 2011). They are wetland turtles. Yellow pond turtle is listed as an endangered species by the IUCN and is on Appendix II on CITES (ENV, 2018). The albino form of this species can be sold for as high as $4,500 (Thong et al., 2019). These turtles are farmed in Vietnam and are often traded in large quantities (Horne et al., 2011). The species is included in Decree 32/2006/ND-CP whereby anyone who is caught with illegal trading of this species can be sentenced to up to three years in prison.

YELLOW-HEADED TORTOISE (INDOTESTUDO ELONGATA)

Yellow-headed tortoise is native to southern Vietnam (Ihlow, Geissler, Sovath, Handschuch, & Bohme, 2012). Historically, it could be found in the Cat Tien National Park but it is no longer seen there (Le, 2007). The yellow-headed tortoise is on the IUCN endangered list and CITES Appendix II (ENV, 2018). The species can be sold for $15 to $113 per turtle (Thong et al., 2019). The species is listed on Decree 32/2006/ND-CP whereby illegal traders can be sentenced to up to three years in prison (Thong et al., 2019).

BLACK-BREASTED LEAF TURTLE (GEOEMYDA SPENGLERI)

Black-breasted leaf turtle is a native species to Vietnam (Henze, Schaeffel, Wagner, and Ott, 2004). Black-breasted leaf turtles are consumed less for food and traditional medicine than many other large turtle species (Horne et al., 2011). The species is more likely to be traded as pets, usually as adults (Thong et al., 2019). Black-breasted leaf turtle is on the IUCN endangered list and CITES Appendix II (ENV, 2018). The price of this species is between $5 and $15 per turtle (Thong et al., 2019).

SOUTHERN VIETNAMESE BOX TURTLE (CUORA PICTURATA)

Southern Vietnamese box turtles can be found in the Lang Bian Plateau in southern central Vietnam (Khan Hoa and Phu Yen province) (Stanford et al., 2018). The species is smuggled into China for food, medicine, and as pets. Southern Vietnamese box turtles is one of the 50 most endangered turtle species in the world (Stanford et al., 2018). Breeding this species in farms can be difficult as these turtles are easily stressed in captivity. Their small clutch size of 1 to 3 eggs makes reproduction slow (Stanford et al., 2018). Most of the turtles that are being sold from farms are probably from the wild and not from breeding in captivity. This species can be sold for $70 to $90 per turtle (Thong et al., 2019). Southern Vietnamese box turtle is on the IUCN critically endangered list and CITES Appendix II (ENV, 2018).

ASIAN GIANT SOFTSHELL TURTLE (PELOCHELYS CANTORII)

Asian giant softshell turtle is native to Vietnam (Stanford et al., 2018). The only viable population for this species can be found in the lower Mekong River in Cambodia. It is among the top 25 most endangered turtle species in the world. Asian giant softshell turtles are used in traditional medicine and their eggs are harvested (Horne et al., 2011). A stricter trade regulation and identification strategy is needed for this species because they are often traded under the pretense of being a more common species — the Asiatic softshell turtle (Amyda cartilaginea). The species is on the IUCN endangered list and CITES Appendix II (ENV, 2018). The species is also on the Decree 160/2013/ND-CP whereby illegal traders can get sentenced to up to three years in prison (Thong et al., 2019).

KEELED BOX TURTLE (CUORA MOUHOTII)

Keeled box turtle is an indigenous species to Vietnam and is known to be present in the southern Mekong through the Truong Son Mountains of Laos and Vietnam and as far nouth as Quang Nam Province in central Vietnam (Ly et al., 2013). The Cuc Phuong National Park in Vietnam is currently the only actively protected area for this species (Horne et al., 2011). The species is prevalent in the Chinese pet market. Some farms reported successful breeding of keeled box turtles but it is not clear how many are being produced (Das et al., 2016). Some farms are falsely reporting positive results for breeding when they actually pass off wild-caught animals as being farmed. The species is on the IUCN endangered list and CITES Appendix II (ENV, 2018). The species can be sold for between $6 and $22 per turtle (Thong et al., 2019).

CHINESE SOFT-SHELL TURTLE (PELODISCUS SINENSIS)

Chinese soft-shell turtle is an indigenous species to Vietnam (Que et al., 2007). The species is on the IUCN vulnerable list but not on any CITES Appendix (ENV, 2018). The price of a Chinese soft-shell turtle is at around $22 per turtle (Linh et al., 2016). This species is heavily farmed in Vietnam so the price has remained stable over time. Chinese soft-shell turtle features prominently in popular dishes across restaurants.

AFRICAN SPURRED TORTOISE (CENTROCHELYS SULCATA)

African spurred tortoises are not native to Vietnam (Thong et al., 2019). They are imported illegally from Africa. They can be sold at a price of $59 to $2,000 per turtle by Vietnamese sellers (Thong et al., 2019). The species is listed as vulnerable by IUCN and is on Appendix II on the CITES list.

YANGTZE GIANT SOFTSHELL TURTLE (RAFETUS SWINHOEI)

Yangtze giant softshell turtles are native to southern China and northern Vietnam (Le et al., 2014). They live in large wetlands and lakes. The species is nearly extinct with only four left in the world: two in China and two in Vietnam (Fessenden, 2016). There have been attempts to breed the two individuals residing in Suzhou zoo in China. These efforts, however, has been unsuccessful so far. One Yangtze giant softshell turtle recently died in Vietnam in 2016. The two Yangtze giant softshell turtles left in Vietnam can be found in Dong Mo Lake and Xuan Khanh Lake (Dasgupta, 2018; Le et al., 2014). The species has cultural significance in Vietnam. The individual that recently died in 2016 can be tied back to a 15th century legend. The species in on the IUCN critically endangered list and CITES Appendix II (ENV, 2018).

APPENDIX 11: LIST OF RESPONDENTS

VIETNAM

December 14, 2018

- Corina Warfield - Deputy Director, Environment and Social Development Office, USAID
- David Lawson - Chief of Party, USAID Saving Species Program
- Bui Dang Phong - Deputy Chief of Party, USAID Saving Species Program
- Nguyen My Ha - Social Behavior Change Communications Specialist, USAID Saving Species Program
- Dr. Minh Le - PEER Researcher, CRES

December 15, 2018

- Trinh Le Nguyen - Executive Director, People and Nature Reconciliation (PanNature)

December 17, 2018

- Nguyen Thi Phuong Dung - Vice Director, Education for Nature Vietnam (ENV) and Bui Thi Ha – Crime Enforcement, Education for Nature (ENV).

December 18, 2018

- Sara Ferguson - Head of Office, TRAFFIC
- Trinh Nguyen - Senior Program Officer: Consumer Behavioral Change, TRAFFIC
- Hoang Bich Thuy - Country Director, Wildlife Conservation Society: Viet Nam Program
- Tran Thanh Huong - Program Implementation Manager, Wildlife Conservation Society: Viet Nam Program
- Nguyen Thu Huon Communication Manager, Wildlife Conservation Society: Viet Nam Program

December 19, 2018

- Jim Chynoweth - Environment, Science, Technology, and Health Deputy Chief, U.S. Embassy Hanoi
- Dr. Truong Nguyen - Head, Department of Administration, Institute of Ecology and Biological Resources, Vietnam Academy of Science and Technology
- Andrew Wells-Dang - Oxfam

December 20, 2018

- Jake Brunner - IUCN

LAOS

December 25, 2018

- Phothong Siliphong - President, Social Development Alliance Association (SODA)
- Dr. Phaivanh Phiapalath - Independent Conservation Consultant

December 26, 2018

- Khambang Thippavong - Programme Manager, Lao Biodiversity Association (LBA)

December 27, 2018

- Anders Imboden - Development Assistance Coordinator, USAID
- Kevin Price - Political & Economic Officer, U.S. Embassy Vientiane
- Dr. Santi Saypanya - Deputy Country Program Director, Wildlife Conservation Society: Lao PDR Program
- Dr. Sengdeuane Wayakone - PEER Researcher, Faculty of Forestry, National University of Laos

December 28, 2018

- Chrisgel Cruz - Technical Advisor, Wildlife Conservation Society: Lao PDR Program

January 9, 2019 (Skype)

- Francois Guegan - Conservation Director, World Wide Fund for Nature (WWF): Laos

THAILAND

January 3, 2019

- Brian Gonzalez - Partnership Specialist and Objective 3 (Policy & Political Commitment) Lead, USAID Wildlife Asia
- Bussara Pim Tirakalyanapan - Research Officer, USAID Wildlife Asia
- Retno Utaira - Acting Chief of Party, USAID Wildlife Asia

CAMBODIA

October 30, 2018

- Dr. Seak Sophat – Senior Lecturer, Royal University of Phnom Penh
    - Unresponsive to multiple communication attempts

TELEPHONE/SKYPE CORRESPONDENCE

October 4, 2018

- Dr. Mary Blair - Director, Biodiversity Informatics Research, American Museum of Natural History

October 18, 2018

- Dr. Minh Le - PEER Researcher, CRES

November 18, 2018

- Dr. Sengdeuane Wayakone - PEER Researcher, Faculty of Forestry, National University of Laos

December 4, 2018

- Dr. Kim Marion Suiseeya - Assistant Professor, Northwestern University

December 6, 2018

- Mary Melynk - Environmental Security and Resilience Team Leader, USAID – Asia Bureau

December 7, 2018

- Mary Rowen - Senior Wildlife Advisor, USAID - Bureau for Economic Growth, Education and Environment (E3)

February 5, 2019

- Tim McCormack - Program Director, Asian Turtle Program

APPENDIX III: RELEVANT LAWS

VIETNAM

LAW	DATE	DESCRIPTION	LINK
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix I and II	April 20th, 1994	International treaty that regulates the trade of endangered species between countries. The goal is to avoid over-exploitation of species that may lead to their extinction. Appendix I includes species that are threatened with extinction. Appendix II includes species that could become extinct with uncontrolled exploitation. Vietnam signed onto CITES in 1994.	https://www.cites.org/eng/app/appendices.php
Decree 32/2006/ND-CP	March 30th, 2006	Detailed stipulations on the management of endangered, precious, and rare forest plants and animals. Provide list of protected species.	http://envietnam.org/library/Law%20articles/Decree_32_30_March_06_EN.pdf
Decree 82/2006/ND-CP	August 10th, 2006	Detailed stipulations on the management of export, import, re-export and introduction from the sea, transit, breeding, rearing, and artificial propagation of rare, endangered, and precious wild animals and plants	https://vietnam.wcs.org/Portals/119/Law%20Database/English/Decree%2082_2006_ND-CP.pdf?ver=2017-08-07-050416-380
Decision 82/2008/QD-BNN	July 17th, 2008	Provide the list of endangered aquatic species in Vietnam in need of protection, reproduction, and development	http://www.wisdom-vn.org/docs/Decision%2082-2008-QD-BNN.pdf
Circular 90/2008/TT-BNN	August 28th, 2008	Guidance from Ministry of Agriculture and Rural Development on how to handle confiscated wildlife	https://vietnam.wcs.org/Portals/119/Law%20Database/English/Circular%2090_2008_TT-BNN.pdf?ver=2017-08-07-051302-333
Circular 47/2012/TT-BNNPTNT	September 25th , 2012	Provide information on the procedures for obtaining licenses needed to extract resources from the nature	http://www.envietnam.org/images/News_Resources/Law_library/Circular-47_2012_TT-BNNPTNT.pdf

LAW	DATE	DESCRIPTION	LINK
Decree 160/2013/ND-CP	November 12th, 2013	Provide information on the management of endangered, precious, and rare species of animals. Provide a list of species that receive prioritized protection.	https://vietnam.wcs.org/Portals/119/Law%20Database/English/160_2013_ND-CP%20-%20Decree%20160-2013%20-%20EN.pdf?ver=2017-08-07-064016-643

LAOS

LAW	DATE	DESCRIPTION	LINK
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix I and II	March 1st, 2004	International treaty that regulates the trade of endangered species between countries. The goal is to avoid over-exploitation of species that may lead to extinction. Appendix I includes species that are threatened with extinction Appendix II includes species that could become extinct with uncontrolled exploitation. Laos adopted CITES since 2004.	https://www.cites.org/eng/app/appendices.php
Wildlife and Aquatic Law/2007/NA	December 24th, 2007	Provides principles and regulation to encourage conservation, protection, and sustainable regeneration of wildlife and aquatic animals.	http://laotradeportal.gov.la/kcfinder/upload/files/Wildlife%20and%20Aquatic%20Resources%20Law%20(2008)%20Eng.pdf

CAMBODIA

LAW	DATE	DESCRIPTION	LINK
Law on Forestry, 2002	July 30th, 2002	Includes a section that provides guideline and framework on the management, use, and conservation of wildlife in Cambodia. Main focus is on offenses occurring outside of protected areas	http://extwprlegs1.fao.org/docs/pdf/cam50411.pdf
Protected Areas Law, 2008	February 15th, 2008	Includes a section that provides guideline and framework on the management, use, and conservation of wildlife in the protected areas of Cambodia.	http://portal.mrcmekong.org/assets/documents/Cambodian-Law/-Protected-Areas-Law-(2008).pdf

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