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Fish Welfare Initiative



Fish Welfare Scoping Report: Vietnam

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We are grateful for assistance and feedback from Marco Cerqueira, Karolina Sarek, and Lauri Torgerson-White on this report. Their assistance does not necessarily imply that they agree with the conclusions we draw.

We welcome comments, questions, and feedback from all interested parties. To do that, please [contact us](#). We will occasionally update this report as we learn new information.

Summary

Although roughly 100 billion farmed fish are slaughtered annually,¹ little has been done regarding their welfare. Fish Welfare Initiative aims to improve the welfare of farmed fish by working collaboratively with industry and NGO partners. We also believe in not limiting our scope to Western countries, but rather in focusing on the regions of the world that have the greatest potential for impact, wherever those may be.

One such country we examined is Vietnam. In this report, we outline the various fish aquaculture systems used in Vietnam and assess the potential for work to promote higher welfare. Our main findings are as follows:

- **Production and species:** Vietnam is the 5th largest producer of farmed fish globally. The main finfish group farmed in Vietnam is Pangasius (a genus of shark catfish), which comprises 47% of Vietnamese finfish production. Pangasius are primarily farmed in intensive pond culture and cage culture, which are highly concentrated in the Mekong River Delta Region. Vietnam produces the vast majority of globally-exported Pangasius.
- **Welfare improvements:** The most promising welfare interventions in Vietnam seem to be working with European importers of Pangasius to mandate improved water quality, shorter and less stressful transportation routines, and pre-slaughter stunning (although optimal Pangasius stunning parameters still need to be developed).
- **Small-scale aquaculture and wet markets:** While the Vietnamese aquaculture industry is increasingly vertically integrated, 75% of producers still operate on farms of less than 3 hectares in size. These systems tend to be more extensive, and pose

¹ Mood, A. (2019). *Number of farmed fish slaughtered each year*.

different welfare challenges (such as a lack of monitoring of environmental conditions). Most fish produced in small-scale aquaculture are sold (often live) in wet markets, which is highly detrimental to fish welfare.

- **Logistical and other bottlenecks:** It is a long and difficult process to register a non-profit organization in Vietnam. Public attitudes on animal welfare (and particularly regarding fish) are not very progressive, given that animal welfare itself is a relatively new topic in Vietnam.
- **Messaging:** Work promoting fish welfare will be more likely to succeed if coupled with initiatives to improve product quality, business resilience, and sustainability.

We encourage any organization or industry interested in promoting fish welfare in Vietnam to [contact us](#). We are available to provide consulting, training in fish welfare improvements, and access to funding.

Lastly, we would like to thank all those in Vietnam who made this report possible.

Useful Terms

Extensive fish farming: A system in which fish are fed completely from the existing food web within the pond with minimal feed or other inputs from the farmer. There is no control of the environmental conditions. This system usually involves much lower stocking densities and is commonly seen in small-scale farming systems.

Semi-intensive fish farming: A mix between extensive and intensive farming: the fish receive a significant amount of their nutrition from both the ecosystem and from supplementary feed. There is some control of the environmental conditions and available resources.

Intensive fish farming: A system in which fish receive the vast majority of their feed and nutrition from the farmer. Water quality may also be managed through the use of aerators and other systems. Stocking densities are significantly higher than what the environment could naturally support. Widespread in industrial, large-scale fish farms.

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Related Work

Charity Entrepreneurship conducted scoping research to analyze the promise of animal advocacy work in Vietnam. See [blog post](#), [country spreadsheet](#), and [Vietnam short report](#). It ranked animal advocacy work in Vietnam with the following scores:

Country	Z-score	Governmental regulation of NGOs /10	Attitudes towards farmed animals /6	Type of farm animal production /6	#companies/ farms controlling the market /6	Animal advocacy organization /6	Animal protection laws and enforcement /5	Attitudes toward eating animal products /3	Other political and cultural challenges /3	EF English Proficiency Index
Vietnam	-1.1	4	1	3	3	3	3	2	1	53.1

Table 1: Charity Entrepreneurship’s Index for Animal Advocacy in Vietnam. Source: [Charity Entrepreneurship \(2019, July 8\)](#).

Other useful research includes the [FishEthoBase Pangasius profile](#), and [Sørensen 2005](#), which is a survey of the Pangasius slaughtering process in Vietnam.

Background

About Vietnam

Vietnam is located in Southeast Asia and is the eighth most populous country in Asia, with a population of 95 million. A series of economic and political reforms initiated in 1986 began the transition of Vietnam from an agrarian, centrally-planned economy to one of the fastest growing industrial countries in the world, albeit one that still faces challenges with poverty and corruption.² Modern Vietnam boasts large agriculture, science and technology, and tourism industries. Following China and Norway, Vietnam is the third largest seafood exporter in the world.³

Types of Farming Systems

There is a large diversity in farming systems in Vietnamese aquaculture. These can roughly be broken down by their three corresponding regions:⁴

- **Northern Regions**, where aquaculture is predominately ‘freshwater fish ponds, rice-cum-fish and marine cage culture.’
- **Central Regions**, where there is an emphasis on ‘the intensive culture of giant tiger prawn and the marine cage culture of finfish and lobster.’

² Van Tho, Tran (2003). *Economic development in Vietnam during the second half of the 20th century: How to avoid the danger of lagging behind*.

³ De Jong, D. (2019, May). *World Seafood Map 2019*.

⁴ Aquaculture Vietnam. (2020). *Vietnam Aquaculture Overview*.

- And **Southern Regions**, where production is the most diversified, including ‘pond, fence and cage culture of catfish as well as several indigenous species such as snakehead fish, climbing perch and giant river prawn, various intensification levels of shrimp culture and integrated culture such as rice-cum-fish, rice-cum-prawn and mangrove-cum-aquaculture.’

In general, however, most aquaculture is freshwater (Fig. 1).

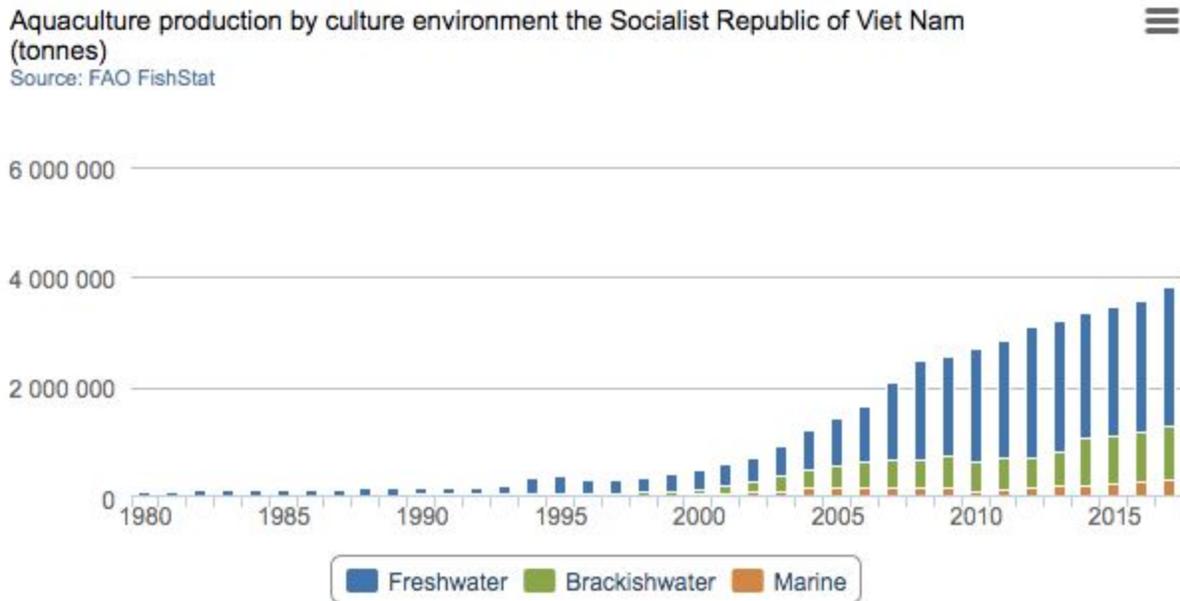


Figure 1: Aquaculture production by Culture Environment. Source: [FAO \(2020\)](#)

There is a broad range of extensive aquaculture practices in Vietnam. For example, there are many rice-cum-fish farms (Fig. 2),⁵ particularly in Northern regions. In these systems fish and rice are grown in the same land (this increases profit per square foot, and allows the fish to benefit from the fertilization and weeds of the farmland). The welfare implications of extensive fish production are not as straightforward as they may seem. Although extensive systems tend to have lower-stocking densities, and more care can be given to individual fish, they also tend to have less monitoring of water quality and disease. However, it does require more resources to implement welfare improvements for similar numbers of fish within extensive systems, as total production is generally lower. In addition, many extensive producers lack the financial resources to implement meaningful changes (see [Small-Scale Fishing and Aquaculture](#)).

⁵ FAO (2020). *National Aquaculture Sector Overview Viet Nam- Farming Systems Distribution and Characteristics*.



Figure 2: Rice-cum-fish culture, Indonesia. Source: Miao Weimin (see [FAO \(2016\)](#))

It is difficult to get an accurate picture of the breakdown of extensive and intensive systems in Vietnam. The Ministry of Fisheries in Vietnam reported that ‘shrimp farming systems in Vietnam in 2003 comprised 3 percent semi-intensive and intensive, 22 percent improved extensive and 75 percent extensive or semi-extensive culture.’⁶

See Table 2 for a summary of production numbers and most common farming systems.

Fish Group	Production (tons)⁷	Most common farming system⁸
Pangasius	1,288,513	Intensive, pond, monoculture
Cyprinids	509,254	Likely semi-intensive, pond or cage, polyculture

Table 2: Major Fish Group Production Numbers and Farming Systems.

⁶ FAO (2020). *National Aquaculture Sector Overview Viet Nam*.

⁷Moode, A. Brooke, P. (2019, September). *Estimated numbers of individuals in aquaculture production (FAO) of fish species (2017)*.

⁸ FAO (n.d.). *Freshwater Fish Culture Extension, Viet Nam*, Mood, A. (2019). *Development of intensive fish farming.*, Fisheries and Aquaculture in Europe (2012, June). *Carp.*, and Tuan, L. A. (2002). *Status of Aquaculture and Associated Environmental Management Issues in Vietnam*.

Scale and Species

Vietnam is the 5th biggest producer of aquaculture food fish globally, with 3,625,000 tons of food fish being produced in 2016.⁹ Production is predominantly split between finfish (71.5%) and decapod crustaceans (20.6%).¹⁰ Of the finfish produced in 2017, the main fish groups are Pangasius (47% total finfish production) and Cyprinids (18.6% total finfish production, predominantly carp).¹¹ Finfish production has been increasing at a high rate from the early 2000s up to the present day.¹² The FAO projected that Vietnamese aquaculture will grow by 40.3% from 2016 to 2030.¹³ The majority of production growth for 2020 is expected to be for freshwater species.¹⁴

Pangasius (Pangasius)

Vietnam produces 1,288,513 tons of Pangasius, which is an estimated 859 to 2577 million individual fish.¹⁵ This is around half of the global production of Pangasius.¹⁶ Vietnamese Pangasius includes species like the iridescent shark (*Pangasius hypophthalmus*), and basa (*Pangasius bocourti*).¹⁷ Pangasius accounts for 26% of the total export value of Vietnam's seafood industry,¹⁸ as well as 33% of total aquaculture production (Fig. 3).¹⁹ Vietnam aims to increase production of Pangasius by 7% by the end of 2020.²⁰

In Vietnam, Pangasius are typically farmed intensively in monoculture within earthen pond and riverbed floating cage systems.²¹ Pangasius farming is especially prevalent in the Mekong River Delta region.²²

⁹ FAO (2018). *The State of World Fisheries and Aquaculture*.

¹⁰ Moode, A. Brooke, P. (2019, September). *Estimated numbers of individuals in aquaculture production (FAO) of fish species (2017)*.

¹¹ Ibid.

¹² Vietnam General Statistics Office (2020). *Production of aquaculture*.

¹³ FAO (2018). *The State of World Fisheries and Aquaculture*.

¹⁴ Gibson, D. (2019, October 29). *GOAL survey expects major farmed finfish species to smash 40m metric tons in 2020*.

¹⁵ Moode, A. Brooke, P. (2019, September). *Estimated numbers of individuals in aquaculture production (FAO) of fish species (2017)*.

¹⁶ FAO (2019, June 24). *Viet Nam pangasius farmers reap bumper profits in 2018*.

¹⁷ FAO (2020). *National Aquaculture Sector Overview Viet Nam*.

¹⁸ Humane Slaughter Association (2018, February). *Humane slaughter of finfish farmed around the world*.

¹⁹ Gibson, D. (2019, October 29). *GOAL survey expects major farmed finfish species to smash 40m metric tons in 2020*.

²⁰ Ibid.

²¹ Sørensen, N. K. (2005). *Slaughtering processes for farmed Pangasius in Vietnam*.

²² FAO (2020). *National Aquaculture Sector Overview Viet Nam*.

Vietnam Pangasius Aquaculture Production in tons (2017)

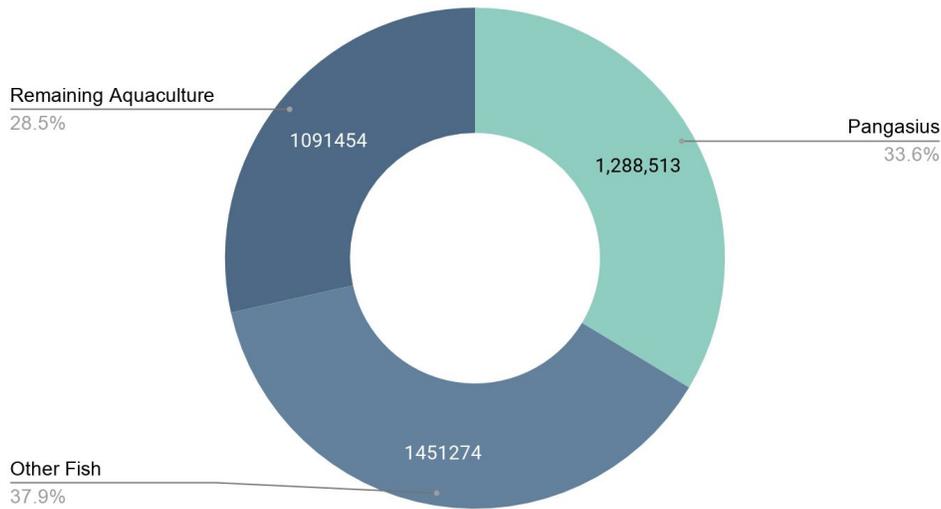


Figure 3: Vietnamese Pangasius Aquaculture Production. Source: illustrated by FWI, numbers from [Mood, A. & Brooke, P. \(2019, September\)](#).

In 2016 Pangasius was the 11th most farmed fish globally, comprising 3% of global aquaculture production.²³ Its production has grown rapidly over the previous decade,²⁴ due in part both to demand for a white fish like Pangasius that lacks a “fishy” taste, as well as its position as a relatively cheaper product. Compared to other farmed fish groups, Pangasius is unusual in that virtually all of its global exports (e.g. 98% of exports to the EU) come from a single country: Vietnam.²⁵

Pangasius are typically considered ‘hardy’ fish, with relatively high resilience to poor conditions such as high stocking densities.²⁶ It is important not to conflate this with high welfare under these conditions, however, as the mere fact that mortality rates are low is not sufficient to determine an appropriate level of welfare. More information on similar species-specific considerations can be found in Fish Welfare Initiative’s report: [Prioritizing Fish Species for Effective Welfare Improvements](#).

From our preliminary research into species, we found Pangasius to be resilient to negative stimuli (such as poor water quality), calling into question the promise of improving their welfare.²⁷ This, however, is only a tentative conclusion. The welfare requirements of

²³ FAO (2018). *The State of World Fisheries and Aquaculture*.

²⁴ Castanheira, M. F. (2020, January 3). *Pangasianodon hypophthalmus*.

²⁵ FAO (2019). *Viet Nam on track for USD 2 billion annual pangasius export target as high prices continue*. World Wildlife Fund (2012). *Farmed Pangasius Fact Sheet*.

²⁶ Examples of Pangasius being referred to as ‘hardy’: Gupta, Sandipan. (2016). *Pangasius pangasius, A Threatened Fish of Indian Subcontinent*.

²⁷ [Contact us](#) for our unpublished preliminary species research.

Pangasius are still uncertain, and [FishEthoBase](#)'s 0/10 certainty score for their research into iridescent shark (*Pangasianodon hypophthalmus*) signals that further research is needed.²⁸

Carp (Cyprinids)

In 2017, Vietnam produced 110,970 tons of common carp (*Cyprinus carpio*), which is an estimated 44 to 222 million individual fish.²⁹ It produced a further 398,284 tons of other cyprinid species,³⁰ such as silver carp (*Hypophthalmichthys molitrix*), grass carp (*Ctenopharyngodon idellus*) and bighead carp (*Aristichthys nobilis*).³¹ This totals to 509,254 tons of cyprinid production in 2017.

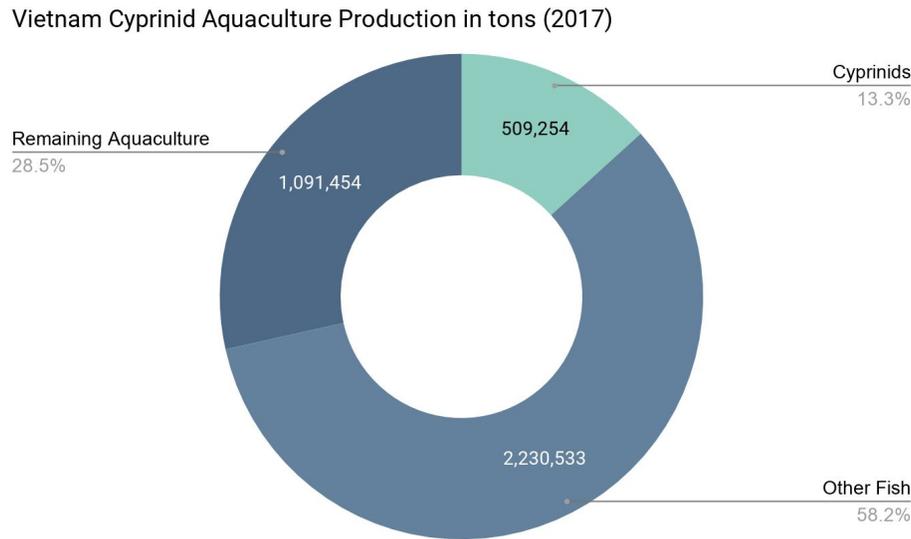


Figure 4: Vietnam Cyprinid Aquaculture Production. Source: Illustrated by FWI, numbers from [Mood, A. & Brooke, P. \(2019, September\)](#)

Carp aquaculture can be found across the whole of Vietnam and most commonly occurs using polyculture,³² with pond and cage systems being the most common.³³ There is much divergence between different carp species and their welfare needs, with some carp (such as crucian carp) seemingly coping well even in anoxic conditions (in part because carps are mouth breathers),³⁴ while other carp are significantly more sensitive. The common carp, however, does seem likely to suffer under common aquaculture practices. FishEthoBase states that there is a relatively middling level of achievable welfare (ranked 4/10) that is not

²⁸ Castanheira, M. F. (2020, January 3). *Pangasianodon hypophthalmus*.
²⁹ Moode, A. Brooke, P. (2019, September). *Estimated numbers of individuals in aquaculture production (FAO) of fish species (2017)*.
³⁰ Ibid.
³¹ FAO (2020). *National Aquaculture Sector Overview Viet Nam*.
³² Polyculture is the farming practice of raising multiple species together simultaneously.
³³ FAO (n.d.). *Freshwater Fish Culture Extension, Viet Nam*.
³⁴ Vornanen, M. et al. (2009). *Chapter 9 The Anoxia-Tolerant Crucian Carp*.

being met by lower conditions (ranked 1/10).³⁵ This is exacerbated by the fact that common carp tend to have fairly low mortality rates under poor conditions, and so are liable to endure poor welfare for drawn out periods of time without mortalities occurring.³⁶

Other Aquatic Animals

There is a large diversity of species farmed in Vietnam, in part due to the diversity of production systems.³⁷ In 2017, the FAO identified the second biggest group of finfish farmed in Vietnam as ‘freshwater fish not elsewhere identified,’ with a production of 647,072 tons.³⁸ These include fish such as climbing perch (*Anabas testudineus*) and Indonesian snakehead (*Channa micropeltes*).³⁹

Shrimp is also produced in large quantities in Vietnam: In 2017, 747,333 tons were produced (Fig. 5).⁴⁰ Were this to be considered a group of finfish, it would be the 2nd highest produced group. In 2017, 82.6% of shrimp was produced in the Mekong River Delta region (617,718 tons).⁴¹ Vietnam’s Ministry of Agriculture and Rural Development has put in place plans to double Vietnam’s 2018 shrimp production by 2030.⁴² This seems to be part of a general trend towards increasing growth in the Vietnamese aquaculture sector.

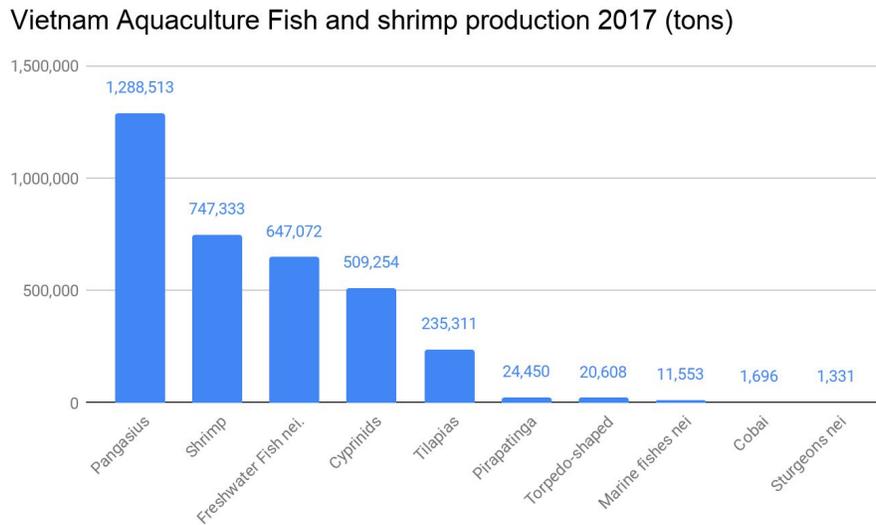


Figure 5: Vietnamese Aquaculture Fish and Shrimp Production. Source: [Mood, A. & Brooke, P. \(2019, September\)](#)

³⁵ Castanheira, M. F. (2020, January 3). *Cyprinus carpio*.
³⁶ Overviews of common carp’s ability to withstand poor conditions: Invasive Species Compendium (2020). *Cyprinus carpio- water tolerances*. and Castanheira, M. F. (2020, January 3). *Cyprinus carpio- water parameters*.
³⁷ FAO (2020). *National Aquaculture Sector Overview Viet Nam- Practices/ Systems of Culture*.
³⁸ Mood, A. Brooke, P. (2019, September). *Estimated numbers of individuals in aquaculture production (FAO) of fish species (2017)*.
³⁹ FAO (2020). *National Aquaculture Sector Overview Viet Nam- Cultures Species*.
⁴⁰ Vietnam General Statistics Office (2020). *Production of aquaculture shrimp by province*.
⁴¹ Vietnam General Statistics Office (2020). *Production of aquaculture shrimp by province*.
⁴² Ojamaa, P. (2018, October). *Research for PECH Committee - Fisheries in Vietnam*.

Observed Conditions

We had the opportunity to visit several different sites where fish are reared, processed, and sold. The following details our observations:

Pangasius Pond Farming and Processing

Pangasius are increasingly farmed in large, monoculture, intensive environments. Stocking densities can reach 40-60 fish per square meter in earthen ponds, and even more in net cages and pens.⁴³ This is consistent with our observations at a Pangasius pond farm in the Mekong River Delta region, where we estimated mean stocking densities to reach around 16 fish per cubic meter.⁴⁴ This is below the recommended maximum density of 25 fish per cubic meter, although further research is needed to determine optimal densities.⁴⁵ This facility had a hatchery on site, and outside of breeding and transportation to the grow-out pond, the only time the fish seemed to be handled was during transportation to slaughter. It was unclear whether the fish were being vaccinated, which would require further handling.

The farm noted some concerns with the quality of the water, which was piped in and treated from a nearby river. This water occasionally causes infections and disease outbreaks, suggesting pollution and degraded water quality. It was unclear what the typical oxygen levels were (Pangasius can survive low levels of oxygen, but this may itself be cause for concern).⁴⁶ Workers remove a few dead fish a day from the pond, suggesting relatively low mortality (Fig. 6).

⁴³ FAO (2020). *Cultured Aquatic Species Information programme- Pangasius hypophthalmus*.

⁴⁴ These figures were calculated by the information we obtained at our visit: 500,000 fish, 8,000 square meter pond, 4 meters deep, and an estimated slaughter weight of 1kg.

⁴⁵ Volstorf, J. (2019, December 20). *Pangasianodon hypophthalmus*.

⁴⁶ Volstorf, J. (2019, December 20). *Pangasianodon hypophthalmus*. In some cases, more resilient groups of fish (like Pangasius) may actually endure lower welfare than less resilient species of fish. This is because producers have less incentive to optimize for welfare if mortality rates will be low regardless.



Figure 6: Pangasius earthen pond farm. This 8,000 square meter large and 4 meter deep pond holds 500,000 Pangasius catfish. The picture to the right shows the Pangasius in a feeding frenzy. Intensively farmed Pangasius consume a massive quantity of feed, accounting for 70-90% of production costs.⁴⁷ Source: personal photo.

After eight months, Pangasius are generally taken along the river in a well boat. This process involves handling the fish to move them from the pond to the boat in the river, and then from the river to the processing facility upon arrival several hours later (Fig. 7).



Figure 7: Pangasius transport from well boat to slaughter. From top left onwards, clockwise, are the fish being unloaded from the well boat into buckets, then transported by crane to be loaded into the waiting truck. The fish are transported live in buckets without water, causing the fish to experience acute stress. Source: personal photos.

⁴⁷ Waycott, B. (2015, September 14). *Pangasius Farming: Feed and Nutrition*.

At the facility we visited, Pangasius were transported out of water in buckets from the well boats to reach the processing facility. We estimated a total duration of 8-23 minutes from the time the fish are removed from the water in the boats to when they are slaughtered.⁴⁸ However, we believe that this out-of-water transportation time is somewhat longer than average.⁴⁹

In the slaughter line, Pangasius were killed by exsanguination via their gills slit, and then placed in a bleeding out tank (Fig. 8). No prior stunning occurred.



Figure 8: Pangasius slaughter. This slaughterhouse processes roughly 75,000 Pangasius a day, with an estimated two fish killed a second. Fin movements and swimming attempts were observed after the fish' gills had been slit. See [this video](#) for a similar process. Source: personal photo.

The vast majority of Vietnamese Pangasius do not seem to be stunned before they are slaughtered.⁵⁰ While we did not witness any stunning at the facility we visited, it was apparently equipped with stunning equipment (it was unclear whether this was electrical or percussive). However, due to the slowdown in line speeds it causes, the facility apparently only stuns the fish exported to Europe, and not the ones exported to North America or other parts of Asia. Our understanding is that the demand for stunned fish likely results from pressure from Tesco, a European supermarket chain that is a large purchaser of

⁴⁸ See estimate [model](#).

⁴⁹ This is due to our conversation with one person familiar with Vietnamese aquaculture, who noted that most processing facilities are right on the river (as seen in [this video](#)), as opposed to a short drive away (as the one we visited was).

⁵⁰ This is our impression from our experience at the processing facility and from Mood, A. (2019). *Slaughter of farmed fish.*, Nguyen Doan, K. L. (2019, June) *Analysis of Organic Pangasius value chain in the Mekong Delta, Vietnam.*, and Sørensen, N. K. (2005). *Slaughtering processes for farmed Pangasius in Vietnam.*

Vietnamese Pangasius.⁵¹ These companies are likely motivated by the higher interest in fish welfare displayed in several European countries. For instance, German law requires that fish be made “insentient” before slaughter.⁵² Generally, Europe’s decisions on fish slaughter result from the Lisbon Treaty from 2009 which recognizes animals’ sentience and therefore urges the reduction of suffering and pain.⁵³

Both at this facility and elsewhere, we heard stories of European and US companies returning whole containers of exported Pangasius, due to food safety and product quality concerns (e.g. excess antibiotic residue). Producing fish that meet the stringent demands of industrialized markets appears to be a bottleneck in the Vietnamese aquaculture industry.

We found producers to generally be very open to speak with visitors and allow visits to their farms. However, a warm connection and at the very least a Vietnamese translator is usually necessary.

Small-Scale Fishing and Aquaculture

75% of Vietnam’s aquaculture operations are less than 2 hectares in size, with 90% less than 3 ha.⁵⁴ We visited a small farm in the countryside, which had chickens, crops, and 100-300 fish. The fish were primarily carp and were kept semi-intensively in an earthen pond. The purpose of this farm was primarily to feed the family that worked it, as well as some of their friends and extended family. To slaughter the fish, they would be captured on a fishing pole when needed, followed by the use of a priest (a type of club) to percussively stun and possibly kill the fish. We did not witness any mouth-breathing (which would suggest lower oxygen levels) or dead fish. Our understanding was that this farm was fairly representative of Vietnamese small-scale pond aquaculture (Fig. 9).

⁵¹ This is from our conversation with one individual familiar with the Vietnamese Pangasius industry and its exports to Europe.

⁵² German Federal Agency for Agriculture and Food (2020). *Humane anesthesia and slaughter of fish*.

⁵³ Compassion in World Farming (2009, December 1). *The Lisbon Treaty: Recognising Animal Sentience*.

⁵⁴ Philips, M. et al. (2016). *Aquaculture Big Numbers*.



Figure 9: Small-Scale Pond Farm. This family's small farming practice was representative of a growing push in Vietnam, led by the upper middle class, to return to the land and be self-sufficient. This is motivated in part by growing concerns about food safety.⁵⁵ Source: personal photo.

Additionally, we visited one of the floating fishing villages of Ha Long Bay (Fig. 10). Along with tourism, fishing and aquaculture is one of the largest economic sectors of the region, important for both local income and dietary needs. In our tour of one of the floating villages, nearly all of the houses had net cages, holding up to several hundred fish in each. Fish groups commonly farmed include koi, grouper, bass, and cobia. Farmers at such villages generally have lower economic prosperity, such that any intervention targeting improved fish welfare in such a location will likely need to be coupled with some sort of economic assistance to farmers. As there is no vertical integration, any welfare improvements would need to be adopted by a large number of small-scale farmers in order to have a significant impact, and would thus be very challenging and probably not cost-effective.

⁵⁵ This is from our unpublished conversation with the locals who operated the farm.



Figure 10: Small-Scale Fishing Village: From the top, clockwise, are: 1) A floating house where fish are farmed in net cages. 2) Wild-caught fish (likely herring) used to feed the farmed fish. 3) A fish we observed with a spinal deformity. Source: personal photos.

Wet Markets

After fish are raised in smaller-scale operations such as Ha Long Bay, they are usually transported alive for sale in local wet markets (Fig. 11). Common methods of slaughter here include exsanguination and asphyxiation (although, because asphyxiation is passive it is not technically a slaughter method).⁵⁶ The manner in which fish are transported to and slaughtered in these markets is extremely stressful for the fish.

⁵⁶ This is based on our visits to local wet markets, as well as our unpublished conversations with local Vietnamese people.



Figure 11: Vietnamese Wet Markets and Live Sale of Fish. From the top, clockwise, are: 1) Red tilapia left alive in the air - they were still displaying gill movements and other signs of life at the time of the picture. 2) Live fish for sale, a common site in wet markets. 3) Fish sold live at a restaurant, a common practice at Vietnamese seafood restaurants. After the customer selects the fish, it is then slaughtered and cooked. Aside from the small enclosure and high densities, many of these fish displayed visible signs of health issues: notice the inverted (yet still alive) fish in the center. Source: personal photos.

For additional images, please [contact us](#).

Potential for Welfare Improvements Work

Structure of the Fish Industry

According to the FAO, “about 75 percent of the 2.4 million households engaged in aquaculture production are small-scale producers, with farm sizes of less than 2 ha, and

90% of these households have farm sizes less than 3 ha” (Fig. 12).⁵⁷ These numbers are from 2016 and imply that the majority of farms are extensive or semi-intensive. This does not, however, necessarily equate to the majority of fish being raised in extensive or semi-intensive systems, as each extensive farm holds only a fraction of the fish of an intensive farm. Vietnam is moving rapidly towards industrialization, which implies that intensive systems will become more common.

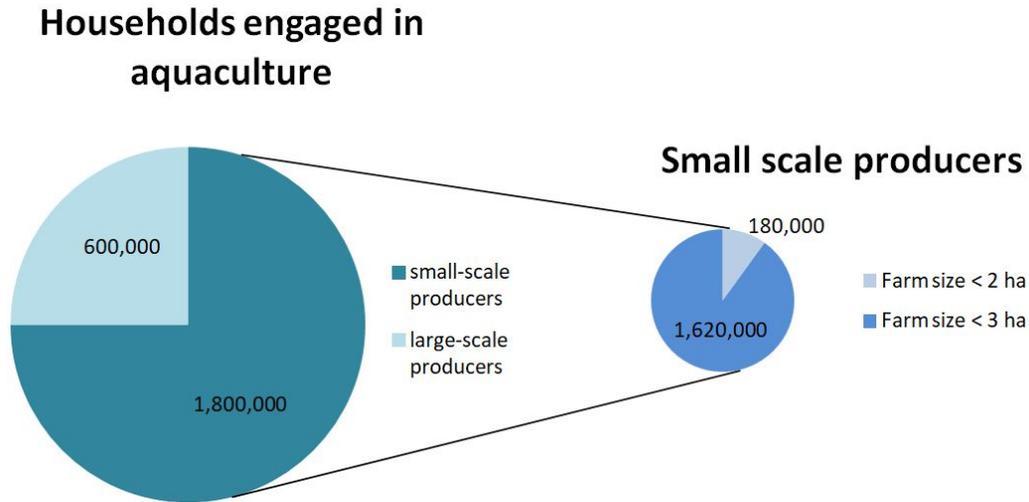


Figure 12: Households Engaged in Aquaculture. Source: Illustration by FWI, numbers from [Philips, M. et al. \(2016\)](#).

While most fish farming systems in Vietnam seem to be small-scale and sell at local markets, the large seafood companies [Vinh Hoan Corp.](#), [Huon Vuong Corp.](#), and [Agifish](#) possess a high degree of vertical integration owning farms, supply chains, retailers and stock shares. The major retailers in Vietnam, all of which sell large quantities of fish, are Vincommerce with VinMart and VinMart+, AEON Vietnam with Megamart, Fivimart and Citimart, Vietnam’s Big C Supercenters and Lotte Group.⁵⁸ Recently, supermarkets gained importance as an appreciated alternative to individual retailers⁵⁹. In 2016 AEON Vietnam had an annual revenue of USD 164.82 million⁶⁰ while the Lotte Group expects to open 60 more retail stores by the end of 2020. Work aiming to impact fish at scale will almost certainly need to focus on these large seafood companies.

Legal Regulations

Vietnam is a member state of the OIE, which means that it has certain recommended welfare guidelines concerning fish slaughter and transportation. However, these are not species specific, and come with no legal penalty for failing to apply them.

⁵⁷ Philips, M. et al. (2016). *Aquaculture Big Numbers*.

⁵⁸ Smith, G. (2018, November 13). *Vietnam Retail Foods Sector Report 2018*.

⁵⁹ Urch, M. (2016, May 17). *Supermarkets are the future for fish retailing in Vietnam*.

⁶⁰ Truong, L. (2018, November 22). *Who is the most profitable retailer?*

There is little in the way of legal welfare requirements in Vietnamese aquaculture. Those engaged in aquaculture must ensure 'Facilities are conformable with aquatic species and raising methods'.⁶¹ There are some veterinary laws in place, such as the control of diseases, drugs, and feed.⁶² These are all instrumentally valuable to the welfare of the fish involved.

The Animal Protection Index (which is 'a classification of 50 countries around the world according to their commitments to protect animals and improve animal welfare in policy and legislation') gave Vietnam a grading of F (putting it in the worst 12 of the 50 countries reviewed).⁶³ This suggests that fish are afforded little protection within aquaculture.

The World Justice Project Index puts Vietnam 93/126 for regulatory enforcement (where 1 is the best)⁶⁴, implying that there may be issues with regulation, even were there to be laws protecting animal welfare.

Public Attitudes Towards Animal Welfare

Animal welfare is a relatively new topic in Vietnam, especially regarding farm animals. Generally, there is no established public perception towards animal advocacy organizations, as they have yet to be present in public consciousness. While there is a small, yet growing interest in sourcing higher welfare products (mostly international hospitality chains with global commitments, or businesses with a niche market of consumers), there are no medium or large-scale farmers/producers able to deliver these products, as most higher welfare products originate from small-scale farmers. Regarding fish, as people are generally less sympathetic to fish welfare than to that of other animals, we can reasonably expect public attitudes on fish to lag behind those of other animals.

Roughly 16.4% of the Vietnamese population is Buddhist.⁶⁵ However, it is unclear how much this affects attitudes towards animals, as not all Buddhists practice vegetarianism,⁶⁶ and it is also not clear how much more likely Buddhists are to support welfare improvements. There is some evidence that a fair proportion of Vietnamese people are vegetarian (roughly 10%),⁶⁷ however numbers on vegetarianism rates are often incorrect,⁶⁸ and high rates of vegetarianism do not necessarily translate into support for better fish welfare.

⁶¹ Socialist Republic of Vietnam (2017, November 21). *Law on Fisheries*. (see chapter 3, article 38, section 1b)

⁶² FAO (2020). *National Aquaculture Legislation Overview Viet Nam*.

⁶³ World Animal Protection (n.d.). *Animal Protection Index - Vietnam*.

⁶⁴ World Justice Project (n.d.) *WJP Rule of Law Index - Vietnam*.

⁶⁵ See p. 32 in Hackett, C. et al. (2012, December). *The Global Religious Landscape*.

⁶⁶ Liusuwan, N. (2017, December 6). *Why Aren't All Buddhists Vegetarian?*

⁶⁷ Vietnam Kulturális Folyóirat (2011, January 26). *Be veg - the new trend of modern living (Part 1)*.

⁶⁸ See the distinction between different methods of obtaining this data here: Saulius Šimčikas (2018, August 16). *Is the Percentage of Vegetarians and Vegans in the U.S. increasing?*

One additional barrier in public attitudes is that consumers are generally more accustomed than Western consumers to animal use and slaughter, as this is a regular occurrence in wet markets. See [Wet Markets](#).

The State of Animal Protection in Vietnam

There are several local and international organizations working on wildlife and companion animal issues in Vietnam, but only a few of them work on farm animal welfare (and none currently focus on fish):

- [Humane Society International](#): Promotes institutional welfare reforms and institutional plant-based eating.
- [Song Thuan Chay](#): Promotes plant-based eating by way of an online platform.
- [Animals Asia](#): Primarily works on protecting bears, wildlife, and companion animals, with some events on farm animal welfare.

Humane Society International (HSI) is currently the only animal advocacy organization taking an institutional approach in Vietnam (i.e. similar to the approach FWI plans to later take).⁶⁹ HSI played a critical role in the inclusion of a chapter on the humane treatment of farm animals in Vietnam's 2019 Animal Husbandry Law, the first such inclusion in Vietnam's history. While this law does not seem to mention fish, it does mandate the humane treatment of livestock, which could be used when advocating for fish welfare.⁷⁰ HSI notes that the government does show interest in partnering with international farm animal welfare organizations, because it boosts international trade with countries requiring certain animal welfare standards (e.g. many countries in Europe). However, governmental work moves very slowly.

Additionally, there are some religious groups that advocate plant-based eating, but they do not generally have much public programming. There are also a large number of vegan and vegetarian restaurants, especially in Ho Chi Minh City and Hanoi. For instance, at this report's date of publication HappyCow lists 205 vegan and vegetarian restaurants in Ho Chi Minh City (more than twice as many as the 75 in Los Angeles, USA). There have also been a number of new initiatives promoting plant-based eating in schools, universities, and community events.⁷¹

⁶⁹ By "institutional approach", we mean approaches aimed to change "governments, firms, social norms, and the like." See: Reese, J. (2020, February 12). *Institutional change and the limitations of consumer activism*.

⁷⁰ USDA Foreign Agricultural Service (2019). *Vietnam National Assembly passes the Animal Husbandry Law*. and Vietnam Law & Legal Forum (2019). *Law on Animal Husbandry*.

⁷¹ For instance, see Humane Society International's [Green Monday](#).

Logistical Bottlenecks

There are many factors that play into the logistical viability of a given country. In Vietnam English proficiency is low,⁷² and we expect that groups working here will need accessibility to Vietnamese to make any significant progress. Also, registering as an organization in Vietnam is a difficult process,⁷³ which can slow down and inhibit progress. On the other hand, our experience of Vietnam is that there should be no major bottlenecks in terms of accessibility or electricity. This is strengthened by the statistics in Table 3:

Index	Score	Relative
Rural Electrification Rates ⁷⁴	100%	--
Road Density ⁷⁵	48.61	53/125

Table 3: Vietnam Rural Electrification and Road Density Rates. This table shows that electrification rates and road access are unlikely to inhibit work in Vietnam.

Farm proximity is also unlikely to pose an issue, with roughly 70.8% of finfish (and 82.7% of shrimp) production being within the Mekong River Delta Region.⁷⁶ This means that organizations will not have to travel significant distances to work with industry partners.

However, according to the Social Progress Index, there are issues within Vietnam pertaining to inclusiveness and discrimination: Vietnam ranks 102 out of the 146 countries considered (though this has been on a positive trajectory since 2017).⁷⁷ This index, along with figures from other indexes (Table 4), show that there may be some political issues associated with working in Vietnam.

Index	Score	Relative
Freedom in the World 2019 ⁷⁸	Not Free (20/100)	172/209
Corruption Perceptions Index 2019 ⁷⁹	37/100	96/180

Table 4: Vietnam Freedom and Corruption Ranking.

⁷² Education First (2019). *English Proficiency Index*.

⁷³ Cox, V and Sarek, K. (n.d.). *Vietnam*.

⁷⁴ The World Bank (n.d.). *Access to electricity (% of population)*.

⁷⁵ Nation Master (2020). *Country Comparison*.

⁷⁶ Vietnam General Statistics Office (2020). *Agriculture, Forestry, and Fishing*.

⁷⁷ The Social Progress Imperative (2019). *The 2019 Social Progress Index - Vietnam - Compare Countries*.

⁷⁸ Freedom House (n.d.). *Freedom in the world 2019 - Vietnam*.

⁷⁹ Transparency International (n.d.). *Corruption Perceptions Index 2019*.

Levers for Change in Vietnam

Given the lack of strong pro-welfare public attitudes, the numbing daily presence of animal use and slaughter in wet markets, the lack of popular certification schemes, and the apparent lack of precedent of work promoting institutional fish welfare, it would likely be exceedingly difficult to bring institutional change in Vietnam through a message of higher welfare alone. There are, however, other incentives that may motivate producers and companies to invest in higher welfare.

Economically, implementing higher welfare conditions in Vietnam is beneficial to producers for several reasons: it may create a higher quality product⁸⁰ and allow for the product to fetch a welfare price premium (especially if certified by a certification scheme⁸¹). Similarly, improved welfare opens the door to new export markets (such as the European Union), where consumers already demand higher welfare. Implementing positive changes now allows producers to keep up with international consumer demand, ensuring their viability and resiliency in the coming years.

There is also significant overlap with higher welfare and **environmental sustainability**. For instance, in the case of Vietnamese Pangasius high stocking densities and feed rates lead to significant waste production, and thus a degradation in water quality. This water is then often discharged without proper treatment and subsequently pollutes rivers and streams.⁸² Improved water quality management may decrease this pollution in a way that ensures safe and nutritious food (UN Sustainable Development Goal 2) and ensures healthy lives and promotes the well-being of all consumers (UN Sustainable Development Goal 3).⁸³

Conclusion

Recommendations for Work in Vietnam

The following are tentative recommendations based on our understanding of Vietnamese aquaculture, and should be researched further before implementation.

⁸⁰ For instance, see Sørensen (2005), who notes that poor meat quality in Pangasius is related to poor bleeding practices at slaughter. - Sørensen, N. K. (2005). *Slaughtering processes for farmed Pangasius in Vietnam*. Also see Poli et al. (2005) who note that “pre-slaughter and slaughter stressful practices could have an important effect on the flesh quality in fish”. - Poli, B.M. et al. (2005). *Fish welfare and quality as affected by pre-slaughter and slaughter management*.

⁸¹ There are currently no Vietnamese certification schemes for animal welfare, and the international ones are often too expensive for local producers. However, we expect this will change in the future, especially given that ASC, which currently certifies in Vietnam for sustainability, is currently planning the addition of welfare guidelines as well.

⁸² Cong (2017). *An Overview of Agricultural Pollution in Vietnam: The Aquaculture Sector*.

⁸³ United Nations (n.d.). *Sustainable Development Goals*.

Corporate Outreach Welfare Improvements

With corporate outreach, we expect that the international hospitality chains and businesses with niche markets of consumers will be valuable first partners, due to the greater likelihood of them adopting welfare improvements. Following outreach to these businesses, we believe that larger European retailers will be important second partners, due to their massive influence over all aspects of the supply chain and demonstrated ability to enact welfare improvements. However, as Pangasius is positioned as a relatively cheap fish on the global market, any efforts that involve a consumer price premium may be difficult.

The following are the welfare improvements we have the greatest confidence in:

Stunning before slaughter: Slaughtering influences all aspects of an organism's physiology and behavior, with impacts on both welfare and product quality. Implementing stunning before slaughter for Pangasius may be promising, given 1) Pangasius' massive production number, and 2) the tractability implementing stunning across all fish when some stunning already occurs. Companies may be incentivized to do this due to demand and/or certification from higher welfare markets (e.g. the European Union), as well as the benefits stunning has to product quality.⁸⁴ However, there is no one-size-fits-all solution for all species and thus stunning, as well as slaughtering parameters and procedures must be adjusted for each species. Currently there do not appear to be any stunning parameters developed for Pangasius, so further research is needed to determine evidence-based parameters.⁸⁵

Improving water quality: It's worth noting that improvements focused on transportation and slaughter only affect the fish for at most a few hours of their lives. Improving water quality, which affects the fish for their *entire* lives, may therefore be much more impactful. However, we did not collect field measurements on this and are thus less certain. Sørensen (2005) found evidence of poor water quality on various Vietnamese Pangasius farms, and noted that this led to lower meat quality.⁸⁶ As with better slaughter and transportation methods, the correct thing for fish welfare likely means the best thing for business.

We encourage any party interested in implementing water quality improvements in Vietnamese aquaculture to contact us, as we are in contact with an individual who has worked on this previously.

⁸⁴ Sørensen, N. K. (2005). *Slaughtering processes for farmed Pangasius in Vietnam*.

⁸⁵ See Humane Slaughter Association (2018), which lists Pangasius as a "species that might be prioritised for future research for determining stunning parameters" (p.49). - Humane Slaughter Association (2018, February). *Humane slaughter of finfish farmed around the world*.

⁸⁶ Sørensen, N. K. (2005). *Slaughtering processes for farmed Pangasius in Vietnam*.

Reducing transportation stress: Transportation from the well boat to the slaughtering line for Pangasius generally seems to last 10-20 minutes,⁸⁷ is done out of water, and thus causes severe acute stress to the fish. It seems likely that other fish species harvested in Vietnam are transported in a similar manner. We recommend either 1) reducing this duration by implementing on-boat or near-boat slaughter,⁸⁸ or 2) pumping the fish live to the slaughter line so they are not removed from the water. Aside from improved fish welfare, better transportation may also improve product quality. However, these improvements would require significant infrastructure investments (e.g. on-site slaughter machines) that may not be economically feasible.

Governmental Lobbying

Lobbying the government to enact fish welfare legislation, or to enforce the legislation already present as it applies to fish (see the [2019 Animal Husbandry Law](#)), may also be promising, given its potential to impact many more fish. It also has the potential to impact fish in small-scale systems that aren't vertically integrated, such as those sold in wet markets. Our understanding of the Vietnamese government suggests that such lobbying would need to be coupled with a strong message of economic growth, specifically outlining how improving fish welfare would further unlock Vietnam's economic potential. Successful lobbying would likely be slower and more difficult, but potentially more impactful, than corporate outreach.

Movement Building and Shifting Public Attitudes

Even if corporations commit to higher welfare conditions, this will still not immediately impact the likely billions of fish raised on small-scale extensive systems and then sold live in wet markets. To impact these fish, it will be necessary to dramatically shift public attitudes in order to grant fish greater moral consideration. We believe that public advocacy and further building the Vietnamese animal advocacy movement are important avenues to eventually enact change for these fish.

Messaging

As with much of Asia, it does not seem plausible in Vietnam that improvements can be made relying on a message of higher welfare alone. Rather, it is crucial to connect with other issues: improved product quality,⁸⁹ consumer safety, improved business resiliency to changing markets, and sustainability.⁹⁰

⁸⁷ See [Observed Conditions section](#), and Sørensen, N. K. (2005). *Slaughtering processes for farmed Pangasius in Vietnam*.

⁸⁸ Reducing transportation duration and stress would also be desirable in wet markets, where fish are brought live to market and slaughtered there. However, as many Asian consumers prefer to purchase meat that was freshly killed, such an improvement would be difficult to implement.

⁸⁹ Sørensen, N. K. (2005). *Slaughtering processes for farmed Pangasius in Vietnam*.

⁹⁰ Farm Animal Welfare Committee (2016). *Sustainable agriculture and farm animal welfare*.

Registering a Vietnamese Organization

Several farms we visited mentioned that they would be more willing to work with us if we were affiliated with a university or some established Vietnamese institution (although building such connections does take significant time). Therefore, it will be important for any organization advocating fish welfare in Vietnam to register as a Vietnamese organization, or at least partner with a Vietnamese institution. However, our understanding is that registering an organization takes over a year and is costly in legal fees.

Bottlenecks and Crucial Considerations

The following are what we believe to be the key bottlenecks for work in Vietnam to improve fish welfare, as well as the crucial considerations that accompany them. They are roughly listed in what we believe to be their descending order of importance:

- Species welfare consequences
 - To what extent are Pangasius adversely affected by poor water quality?
- Corporate incentives
 - How difficult would it be to incentivize corporations to change?
 - To what extent do food safety and product quality incentives overlap with higher welfare conditions?
- Public attitudes towards farmed fish welfare
 - To what extent can the public be motivated to care about these issues?
- Size of the animal movement
 - How many individuals would get involved in farm animal advocacy if the opportunity to do so was easily available?
 - To what extent could existing vegetarians or vegans, especially those motivated primarily by religious concerns, be motivated to advocate for farmed fish?
- Cultural barriers
 - How difficult would it be to find the right Vietnamese people to hire for advocacy roles?
 - To what extent can foreigners successfully work in Vietnam?
- Vertical integration
 - Is there a plausible avenue to bring change to the fish raised on small-scale operations and sold locally?

Fish Welfare Initiative's Closing Thoughts

Our focus throughout this report has been documenting the welfare constraints of finfish aquaculture in Vietnam. In this section, we will discuss some of our personal conclusions from this.

We currently believe that **Pangasius is the most promising fish group** to work on in Vietnam. This is because much of its production is within the Mekong River Delta region, in intensive systems that lack some of the benefits of more industrialized aquaculture. This includes less disease control and extended periods of out-of-water transportation (much of which Pangasius survive, but are negatively affected by).

For organizations interested in work on pre-slaughter stunning, it seems most promising to begin working with European importers (such as retailers and hospitality chains). Largely due to the influence of these entities there is already some sporadic stunning occurring within processing facilities.

Most of the production within Vietnam is from small-scale producers. **It is important to understand their incentives.** For example, they often do not sell their produce to corporations, and so are isolated from corporate systems that are often utilized by animal protection organizations. It should also be seriously considered as to how change may affect these producers, as they have fewer economic resources to begin with.

Many of the worst conditions can be found in local wet markets, however these are mostly inaccessible to change, except through widespread changes in governmental policy or public attitudes. Both of these seem difficult in Vietnam.

We believe that Vietnam has the capacity to improve fish welfare, and that work doing so could have a significant impact. However, due to concerns with the welfare requirements of Pangasius, the lack of favorable public attitudes and past work in the country, and the unclear tractability of corporate change, **we expect Vietnam to be one of the less promising countries we visit, but still one of the more promising countries for fish welfare work overall.** We are conducting similar scoping work on other countries and we will release our comparative analysis of these at a later point.