

**Fishackathon 2014**  
**New England Aquarium / University of Massachusetts Boston Proposal**  
***A call to improve shrimp farming in India***

**Background:** Aquaculture, the farming of aquatic animals and plants, is a globally important food production system. However, a majority of the industry is made up of mainly small-scale units, including small family farms in developing nations. Environmental impacts, such as pollution and habitat loss, leading to disease and social issues, have ranged from negligible to significant. Aquaculture can also impact wild fish stocks as the creation of feed for the animals requires the input of wild fish. These issues have come to the attention of NGOs, major seafood buyers, and consumers alike.

Shrimp aquaculture has historically been one of the more environmentally impactful sectors of the aquaculture industry. This industry is characterized by its breadth both in terms of countries of production as well as the systems used to grow the shrimp. The environmental impacts vary by both country and production system, as well as through management within each type of production system. To minimize the environmental impacts of shrimp farming, a number of independent third party certification systems were developed as a means to identify best practices and reward the better actors. However, to date, only 2.5 to 5% of the global aquaculture industry has been certified. To improve shrimp aquaculture in particular, a paradigm shift is necessary to engage the most impactful producers that are not able to become certified (see Figure 1). This includes a pressing need for more holistic aquaculture improvement projects to reach the 95% of uncertified farmers. This also includes the need for new and improved data collection methods (to determine both the true environmental cost of shrimp production, as well as metrics by which improvement can be assessed), and the corresponding dissemination of “best practice” methods within the aquaculture industry.

**Problem Statement:** To meet these needs, as part of the Fishackathon, the New England Aquarium / University of Massachusetts at Boston propose to create a cell phone platform to educate farmers on better production practices (biosecurity, disease identification and outbreak notifications, escape prevention, feed management) and the ways in which to reduce environmental impacts. Conjointly, farmers would provide data on impact factors (including but not limited to regional water quality measures, disease outbreak information, feed conversion ratios, the inclusion of wild fish within feed, and regulatory enforcement visits). These data will be analyzed by specialists at the New England Aquarium and will serve to inform subsequent training modules. An important component of these data will be a spatial analysis to identify areas which are points of origin for critical and devastating industry issues such as disease. This platform will allow for the education around better production practices, to reduce environmental impacts and improve product quality across the entire production spectrum from the smallest to the largest producers, from the most environmentally impactful to the least.

**Partner Country:** The partner country for this project will be India. This country was selected, given that it is currently shipping the greatest volume of shrimp to the United States, small scale farmers dominate

production, and there is a broad scale change from black tiger shrimp (*Penaeus monodon*) to white shrimp (*Litopenaeus vannamei*) which are farmed at a higher density and thus can have potentially greater impacts. Currently, all farms must register with the Coastal Aquaculture Authority (CAA), and we will secure support from the Ministry of Agriculture that oversees the CAA.

**Hackathon Workflow:** The four concurrent workstreams that need to be addressed during the Fishackathon include: a portal for information to be delivered to farmers, a portal for data to be collected from farmers, an analysis/presentation plan (including dashboard) for data once it is collected, and an innovation strategies scheme to assess means to derive additional value for the farmers as well as the creation of a strategy for engaging additional countries and aquaculture sectors.

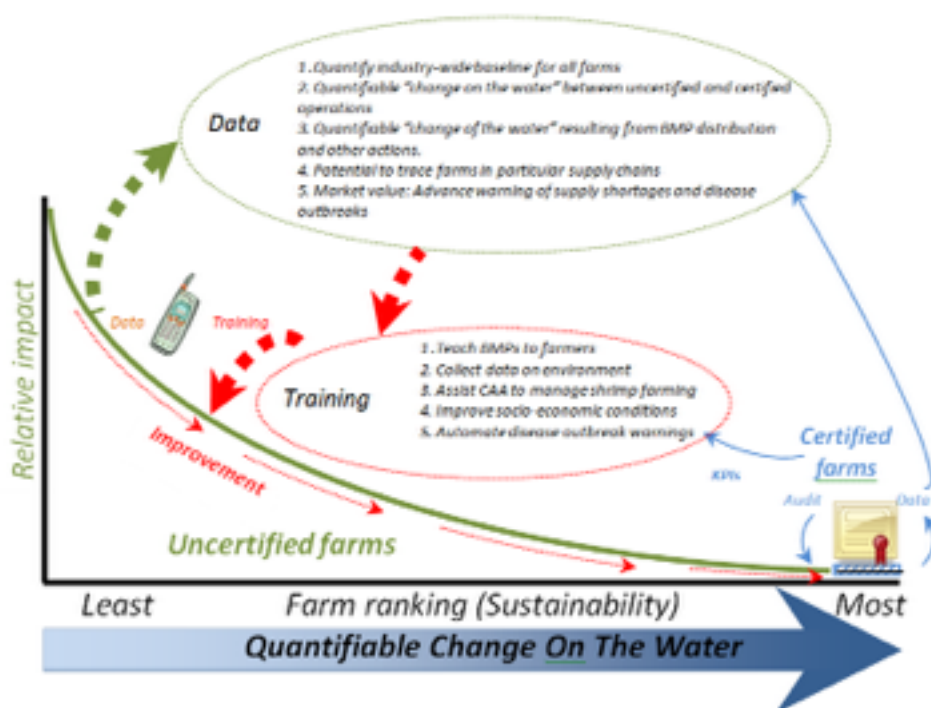


Figure 1: A graphical representation of the pressing need for more holistic aquaculture improvement projects to reach the 95% of uncertified farmers, data collection methods (to determine both the true environmental cost of shrimp production, as well as metrics by which improvement can be assessed), and dissemination of "best practice" methods within the aquaculture industry. This provides the basis for the creation of the Fishackathon workflow.