Mangroves & Aquaculture

For the National Shellfisheries Association MangroveENCODE Workshop

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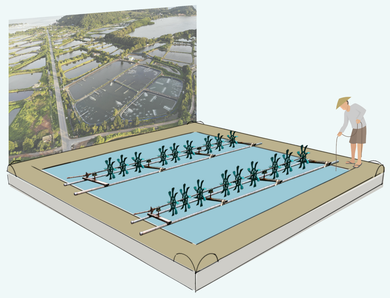
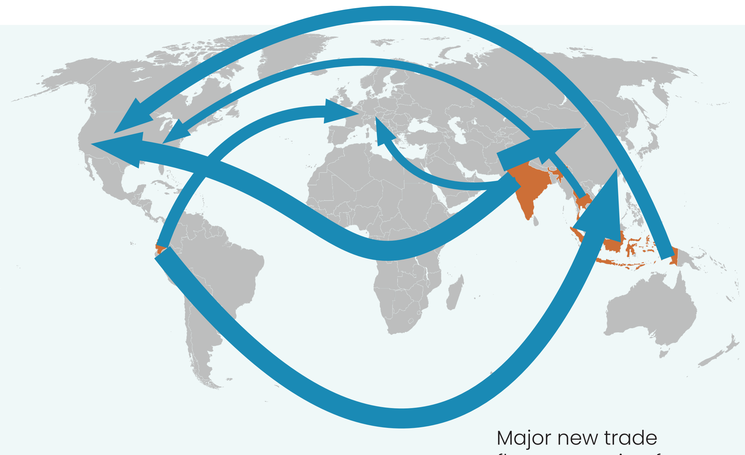
Shrimp Aquaculture



The UN's Food and Agriculture Organisation estimates that **Asia** generates about **75%** of total world production of **farmed shrimp.**

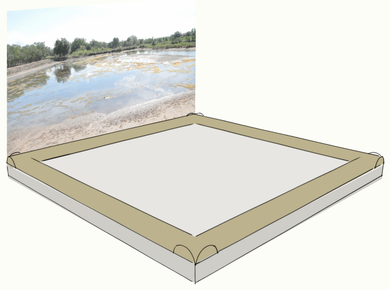
www.fao.org. (n.d.). Farmed shrimp output increased by about 6 percent in 2017 | GLOBEFISH | Food and Agriculture Organization of the United Nations. [online] Available at: http://www.fao.org/in-action/globefish/market-reports/resource-detail/en/c/1136583/



Shrimp Trade in 2017

Major new trade flows emerging from Ecuador and India

Abandoned Shrimp Ponds



An estimated **1.4 million hectares** of **mangroves** have been **cleared worldwide** for conversion to shrimp farms, much of which now lies **abandoned** due to disease and pollution.

Ahmed, N., Thompson, S. & Glaser, M (2018)
Integrated mangrove-shrimp cultivation: Potential for blue carbon sequestration. Ambio, 47, 441–452

The innumerable abandoned pond sites around the world could be brought back into useful mangrove wetland production, if effectively restored. Obstacles to restoring these abandoned ponds include land ownership/ resource tenure issues, and reluctance to rewild these potentially lucrative sites. Restoring these abandoned ponds would be a great contribution to combating climate change, as mangroves are an efficient carbon sink, 5 X more effective at sequestering and storing carbon than other forest types.

Elwin, A., Bukoski, J.J., Jintana, V. et al. (2019) Preservation and recovery of mangrove ecosystem carbon stocks in abandoned shrimp ponds. Scientific Reports, 9, 18275

Solutions

What can we do to stop these **destructive practices** and **help restore coastal ecosystems**?

Mangrove Action Project's (MAP) **vision** is to see these **ponds restored** back to lush, productive mangrove forests, with the help of local communities.

Over the course of more than a decade, MAP Asia has undertaken 13 demonstration sites of abandoned shrimp ponds across the Andaman coast in Thailand, using the Community-based Ecological Mangrove Restoration (CBEMR) method to successfully re-establish healthy, biodiverse mangrove forests where once there was simply barren ponds. Involving local communities and stakeholders right from the outset, this process encourages the mitigation of mangrove stressors and the facilitation of natural regeneration where at all possible. CBEMR works with nature and takes into account mangrove ecology and biology to restore degraded mangroves by mimicking natural processes. Natural regeneration has the advantage of not only producing a more biodiverse mangrove, which increases its resilience to climate change, but is also potentially more economical as it avoids the costs of nurseries and planting out.

Question Your Shrimp!

#1 Increase consumer awareness of the health dangers and environmental and social damage

#2 Increase the number of restaurants and retail outlets who serve only locally produced wild or farmed shrimp

#3 Help decrease demand for imported tropical shrimp produced in Open-Throughout Aquaculture Systems worldwide

A much more **sustainable** approach to shrimp farming is with the use of **Recirculating Aquaculture Systems** (RAS).

RAS are land-based aquaculture facilities – either open air or indoors – that minimise water consumption by filtering, adjusting, and reusing the water. Compared to traditional ponds or open water aquaculture, the water recirculation process in RAS makes it possible to control the culture conditions and collect waste which helps to reduce disease outbreaks. Due to the closed recirculating system, there is no danger of non-native species escaping into nearby marine environments and there is very little chance of diseases and pests transferring to wild species. By controlling the culture conditions, aquaculture production in a RAS facility can be established almost anywhere, meaning shrimp can be raised closer to consumers. With the ever-increasing demand for shrimp, the need for food security and the environmental impact of current aquaculture methods, there is an increasing interest in RAS. A switch to this sustainable approach will not only improve the industry and take pressure off our wild fisheries, but will also give us the opportunity to recover lost coastal ecosystems through restoration and conservation.

Ahmed, N. & Turchini, G. M (2021) Recirculating aquaculture systems (RAS): Environmental solution and climate change adaptation. Journal of Cleaner Production, 126604

Hidden Costs

Today, **less than half** the world's original **mangrove forest** cover remains.

Mangroves are incredible ecosystems that help combat climate change and protect fisheries and coastlines around the world, but they are being lost at an unprecedented rate. The global demand for cheap shrimp, especially in the United States, China, Japan, and Europe is fueling much of this destructive activity. Industrial shrimp farming poses one of the greatest threats to mangrove forests and has caused over 35 percent of the worldwide loss of mangroves.

FAO (2004) The state of world fisheries and aquaculture. Rome

Establishment in mangrove zones means **loss of wild fisheries** & consequent loss of **livelihood** for traditional fishing communities

Although shrimp farming generates substantial income, the sharing of these profits is significantly unequal. Large scale shrimp pond owners and shrimp traders monopolize profits, while hired laborers in shrimp ponds as well as in shrimp processing factories receive small wages. The industry is also putting thousands of rice farmers and fisherman out of business which not only reduces income for many communities but also removes land-rights and longstanding traditional livelihoods.

Diseases are prevalent in shrimp ponds causing **human** and **environmental health problems**

Disease outbreaks in shrimp ponds are a common problem, mainly due intensive farming, low water quality and artificial or alternative feeds. This has led to the use of various antibiotics to enhance shrimp growth and to avoid disease outbreaks. However, the use of antibiotics has been associated with environmental and human health problems, including bacterial resistance, persistence of diseases in the aquatic environment, and effects on the composition of sediment.

Kura, Y., Revenga, C., Hoshino, E. & Mock; G (2004) Fishing for answers – making sense of the global fish crisis. Washington, DC, United States, World Resources Institute