

## OCEANS SURROUNDING ASIAN COUNTRIES AT CRISIS POINT!



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Fleets of large fishing boats working with a factory ship scour the oceans of fish. Shutterstock

### IMPORTANCE OF FISHING IN THE ASIAN REGION

- Asian countries catch 53% of the world's fish.
- Over 85% of the world's fishermen/women and fish farmers are Asian.
- The impacts of declining fish species and climate change are projected to impact more severely in the Asian Region compared to other regions in the world.

#### Southeast Asian Countries

- Proportion of people depending on the fishing industry is significantly higher than in other countries.
- Surrounding seas not only serve as a major source of food and livelihoods for hundreds of millions of people they also generate several billion dollars in Gross Domestic Product (GDP) for the region.
- Most overfishing and destructive fishing is attributable to Illegal, Unreported and Unregulated Fishing (IUUF).
- After depleting fish stocks in their own waters, Asian countries such as China, Japan, Taiwan, and South Korea direct industrial fishing fleets to the Pacific Ocean to exploit fish stocks.

The Asia Foundation estimates that 64% of the region's fisheries are now facing medium to high level threat of collapse. Illegal and unreported fishing is the major contributor to this threat. Fishermen in the region frequently use illegal methods, such as poison fishing and blast fishing with dynamite. If IUU fishing is left unchecked, there is less fish for legitimate fishermen to catch.

Illegal fishing activities have long been a source of contention in regional disputes and flare-ups between ASEAN nations. Malaysia complained about the illegal movement of Vietnamese vessels in Malaysian waters and reportedly detained 748 IUU Vietnamese fishing vessels since 2006.

Adapted notes –

<https://www.aseantoday.com/2019/11/vietnam-has-the-chance-to-showcase-its-progress-on-curbing-illegal-fishing-as-the-european-commission-begins-inspection/>



Seafood is a large part of Asian diets, particularly in those countries with large coastlines and high coastal populations living in villages  
Image source: lisheng-chang-m9BBvPI87M-unsplash.jpg

## Importance of fishing in China

- The world's largest fishing country in terms of quantity caught, followed by Indonesia, USA, India, Peru, and Japan.
- Fishing industry has made a significant contribution to food security, generated employment and sustained coastal economies.
- Present rate of fishing is unsustainable as many species are overexploited.
- As the population of China increases the demand for seafood is anticipated to increase.
- Threats to declining fish species are acute in the Spratly and Paracel Islands located in the South China Sea, where disputed resource rights have led to escalating IUUF.
- Deteriorating coastal fish resources have forced fishermen to take risks in disputed waters. As China shares the same waters as South Korea, Japan, Vietnam and the Philippines, numerous clashes concerning fishing have eventuated.

## DEPLETION OF FISH SPECIES

Overfishing, illegal fishing, water pollution and climate change have contributed to the depletion of fish supplies. Already many species such as blue fin tuna have been pushed to the edge of extinction. If the trend continues some scientists predict that seafood suitable for human consumption could be exhausted by 2050.

## Cause of depletion of fisheries in Asia

### Aquaculture

- Farming fish and shellfish is susceptible to diseases and contributes to declining fish e.g. a salmon farm requires 4kg of fish to produce 1kg of farmed salmon.

### Pollution

- Oceans are dumping grounds for nuclear waste, toxic chemicals, sewage and plastics.
- Oil and chemical spills occur at sea and at ports.

### Coastal Development

- Runoff into water bodies of pesticides, fertilisers, sewage and sediments.
- Clearing wetlands for land reclamation.

### Illegal, unregulated and unreported fishing (IUUF)

- For example: Bottom trawling, Blast fishing, Cyanide fishing, Muroami, Kayakas, and Electro-fishing.

### Diseases and parasites

- Viral hemorrhagic Septicemia (VHS) afflicts over 50 freshwater and marine fish species.

## Pipelines and cables

Mining minerals and oil dredging spoil fish nurseries.

Munitions – Unexploded ordinance (UXO) pose a threat to recreational and commercial fishing boats, aquaculture, divers and whales.

## Overfishing

- Bycatch – Catching unwanted species e.g. dolphins. Exploitation of undersized species.

## Inadequate resources

- Insufficient funds and resources for surveillance and tracking.
- Lack of knowledge and supervision of fishing quotas and fishing methods.

## Invasive species

- For example Nile Perch and Lionfish.
- Red tides – Algal blooms may produce toxins or consume dissolved oxygen and cause damage or death to marine species

## Rising water temperature

- Results in lost habitats for fish. Many fish are sensitive to temperature and only survive in specific temperatures.

## Habitat threats

- Bleaching of coral reefs, clearing wetlands, disappearing kelp forests – all are vital habitats for fish.

## Factory fishing

- Giant factory ships vacuum schools of fish from the sea, which threatens future oceans ocean species.

## Ballast water

- Introduction of exotic species from one port to another. Bacteria and organisms carried in ballast water damages aquatic ecosystems in other parts of the world.

## Oceans Acidification

- Oceans absorb carbon dioxide from the atmosphere.



Blue swimming crabs overfished in Thailand Image source: WWF



## Depletion of Fish Stocks – Thailand

Fishing is big business in the South China Sea and Gulf of Thailand. The industry supports millions of people in the region and accounts for 10% of global fisheries production every year. However, the region's success as a seafood exporter has come at a cost – the depletion of local fish stocks, environmental damage and a decline in food security and livelihoods for local communities.

Once a small-scale industry, dominated by individual fisherman using nets and traps, the fishing industry was adversely impacted by rapid expansion following the introduction of trawlers in the early 1960s, leading to overexploitation, stock depletion, and changes in ocean ecosystems. Today, fisheries are under pressure with growing population, overexploitation of marine resources and poor enforcement of fishing regulations.

The South China Sea Fisheries Refugia Initiative aims to build the resilience of Southeast Asian fisheries and reduce marine degradation. The blue swimming crab is one of the key species in the project. The crabs are a top export from Thailand, with the country ranking as the world's fourth largest exporter over the past two decades. Traditionally caught by small-scale and commercial fisherfolks using crab traps and bottom gillnets, the blue swimming crab population has suffered from large scale trawling operations, with the species frequently caught as bycatch by trawlers in both coastal and offshore areas.

By December 2019, crews from 45 trawlers were participating in the release programme in Thailand's Surat Thani Province – with over 4,000 berried female crabs returned to the sea to spawn. Adapted: <https://www.unep.org/news-and-stories/story/banking-sea>

The **Surat Thani blue swimming crab fishery** is an important export product for Thailand with an export value of US\$60-80 million. There are a number of issues facing this fishery, including the over-exploitation of the population in heavily fished inshore areas, harvest of undersized crab and gravid females, lack of a management plan or harvest strategy, and lack of enforcement capacity.

Source: <https://seafoodsustainability.org/portfolio/thai-blue-swimming-crab/>



Blue swimming crab  
Source: [https://www.fishsource.org/stock\\_page/747](https://www.fishsource.org/stock_page/747)

## ILLEGAL, UNREPORTED AND UNREGULATED FISHING (IUUF)

Illegal, Unreported and Unregulated Fishing (IUUF) or pirate fishing is a global phenomenon, particularly pronounced in Southeast Asian countries such as Thailand and Indonesia. See Figure 1.

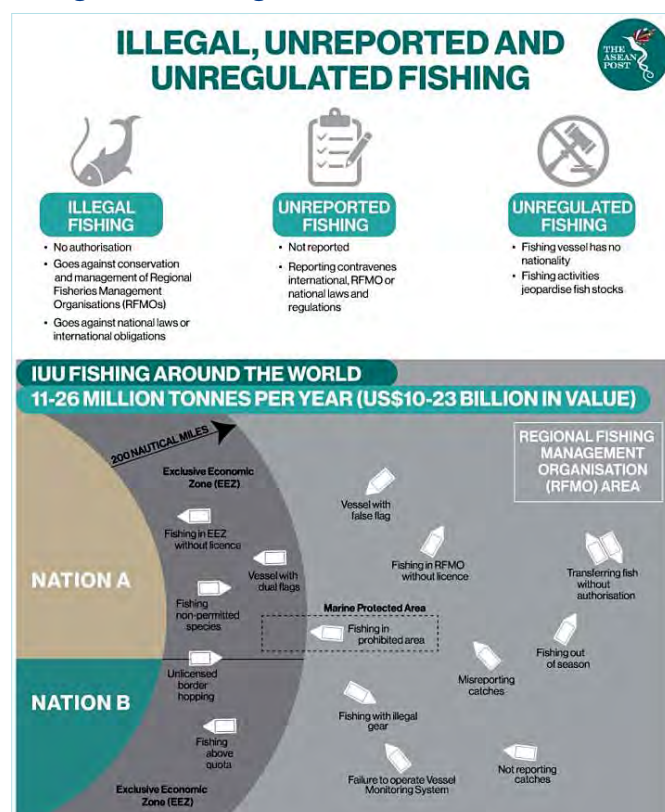
The Asia-Pacific region loses US\$5billion annually to IUU with 14% – 33% of the illegally harvested global catch sold in black markets. See Figure 2

The fishing 'black industry' ranges from small-scale violations by local artisanal fishermen to mass illicit enterprises conducted by large-scale open factory trawlers. It includes the following:

- Operating in another country's territorial waters without agreement and/or falsifying catch documents.
- Using illegal methods or gear.
- Harvesting protected species.
- Fishing in restricted zones.
- Contravening closed-area or closed-season stipulations.
- Transshipping fish species at sea, to avoid landing a haul of fish in the same country where it was fished.

Adapted from source: <https://www.aspistrategist.org.au/illegal-fishing-southeast-asia-multibillion-dollar-trade-catastrophic-consequences/>.

**Figure 1: Facts about Illegal, Unreported and Unregulated Fishing**



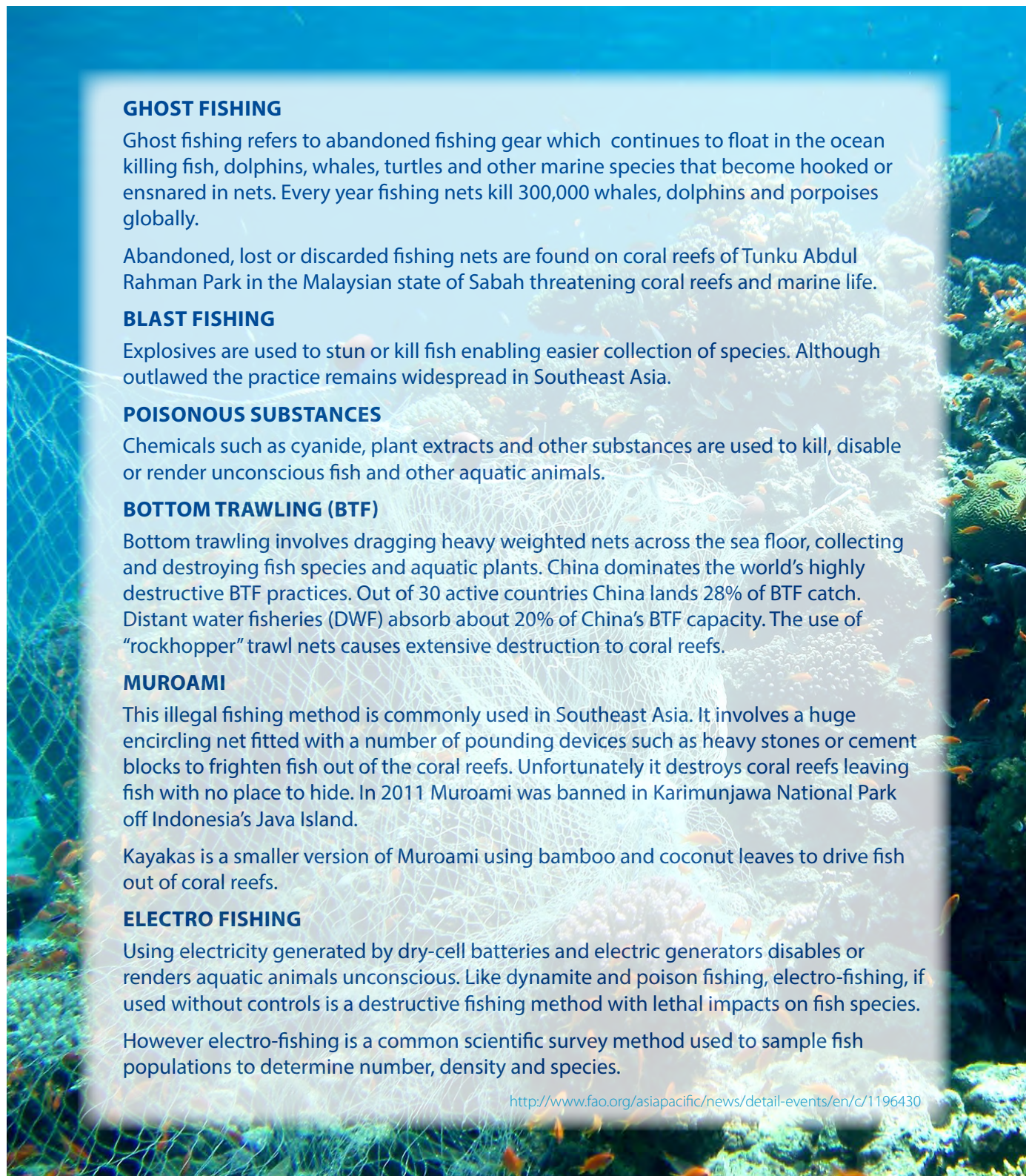
Infographic: <https://theaseanpost.com/article/asean-losing-billions-illegal-fishing>



The monetary value generated from illegal, unreported, and unregulated fishing (IUUF) is estimated to be between \$10 billion and \$36.4 billion annually, making it the third most lucrative natural resource crime in the world, following timber and mining.

Source: [https://c4ads.org/natural-resources-cell?gclid=EALalQobChMlqZ2Y6tCf7wIVQzVYCh11ggcHEAAYASAAEgJEd\\_D\\_BwE](https://c4ads.org/natural-resources-cell?gclid=EALalQobChMlqZ2Y6tCf7wIVQzVYCh11ggcHEAAYASAAEgJEd_D_BwE)

**Figure 2: Illegal, Unreported and Unregulated Fishing Methods (IUUF)**



### **GHOST FISHING**

Ghost fishing refers to abandoned fishing gear which continues to float in the ocean killing fish, dolphins, whales, turtles and other marine species that become hooked or ensnared in nets. Every year fishing nets kill 300,000 whales, dolphins and porpoises globally.

Abandoned, lost or discarded fishing nets are found on coral reefs of Tunku Abdul Rahman Park in the Malaysian state of Sabah threatening coral reefs and marine life.

### **BLAST FISHING**

Explosives are used to stun or kill fish enabling easier collection of species. Although outlawed the practice remains widespread in Southeast Asia.

### **POISONOUS SUBSTANCES**

Chemicals such as cyanide, plant extracts and other substances are used to kill, disable or render unconscious fish and other aquatic animals.

### **BOTTOM TRAWLING (BTF)**

Bottom trawling involves dragging heavy weighted nets across the sea floor, collecting and destroying fish species and aquatic plants. China dominates the world's highly destructive BTF practices. Out of 30 active countries China lands 28% of BTF catch. Distant water fisheries (DWF) absorb about 20% of China's BTF capacity. The use of "rockhopper" trawl nets causes extensive destruction to coral reefs.

### **MUROAMI**

This illegal fishing method is commonly used in Southeast Asia. It involves a huge encircling net fitted with a number of pounding devices such as heavy stones or cement blocks to frighten fish out of the coral reefs. Unfortunately it destroys coral reefs leaving fish with no place to hide. In 2011 Muroami was banned in Karimunjawa National Park off Indonesia's Java Island.

Kayakas is a smaller version of Muroami using bamboo and coconut leaves to drive fish out of coral reefs.

### **ELECTRO FISHING**

Using electricity generated by dry-cell batteries and electric generators disables or renders aquatic animals unconscious. Like dynamite and poison fishing, electro-fishing, if used without controls is a destructive fishing method with lethal impacts on fish species.

However electro-fishing is a common scientific survey method used to sample fish populations to determine number, density and species.

<http://www.fao.org/asiapacific/news/detail-events/en/c/1196430>

Ghost nets on a coral reef Source: [https://upload.wikimedia.org/wikipedia/commons/2/28/CIMG2733\\_Fishing\\_Net\\_On\\_Reef\\_%282692835363%29.jpg](https://upload.wikimedia.org/wikipedia/commons/2/28/CIMG2733_Fishing_Net_On_Reef_%282692835363%29.jpg)



*'IUU fishing enterprises routinely exploit vulnerable migrants. On IUU vessels they face human rights abuses including physical violence, dangerous working conditions, unacceptably long periods at sea and when voyages eventually end, agreed wages are often withheld'*

FAO <http://www.fao.org/asiapacific/news/detail-events/en/c/1196430>

## FISHING TYPES & THEIR IMPACT

A variety of fishing methods and equipment are employed in and across Asia. These range from hand fishing and small vessels to large industrial fishing fleets that trawl the sea.



Small scale fishing. Image source 1: [evgeny-nelmin-xSn0WW7PsF4-unsplash.jpg](https://unsplash.com/photos/evgeny-nelmin-xSn0WW7PsF4). Image source 2: [erg-zhukov-fNrCZRWuZD0-unsplash.jpg](https://unsplash.com/photos/erg-zhukov-fNrCZRWuZD0)



Fishing Trawlers cast nets far from the vessels to target mid depth or bottom species. Image 1 iStock. Image 2 Shutterstock

### Muroami fishing (Muro Ami)

In **Muroami fishing** trawlers are mostly unseaworthy and stay out at sea for up to ten months. They roam the seas and drop anchor in coral reefs and atolls. The unsanitary and cramped quarters are often packed with 400 to 500 adults and boys as young as 7 years old.

The nets are cast between 7 and 10 times a day, with children working from 6am to 5pm. The children are whipped if the nets failed to fill 50%–70% of the containers with fish every dive. On some occasions, the boys are made to stand under the sun for hours as punishment. When fishing trawlers encounter Navy patrols the children are hidden.

Muroami fishing was commonly used in the Philippines as it was the most lucrative type of fishing technique outside larger-scale fishing businesses. In 1986, Muroami fishing was banned in the Philippines after the bodies of 100 child divers, unable to escape the closing net, came up with the catch.

The child divers, usually on a ten-month contract, are promised to be paid at the end of the contract. Their food budget is deducted from their salary at 20 pesos a day. Unfortunately, when the trawler arrives back home, children discover they have no wages left after the ten-month contract.

Adapted content from: <https://instablogs.com/muro-ami-death-of-reefs-and-little-boys.htm>





Children participating in Muroami Image source 1: <http://aqualifeforyou.blogspot.com/2011/01/child-slave-of-deep-sea.html> Image source 2: <https://blueplanetarchive.photoshelter.com/image/I0000BMu3DThqL9o>

## Cyanide fishing

(See Figure 2 and Figure 3)

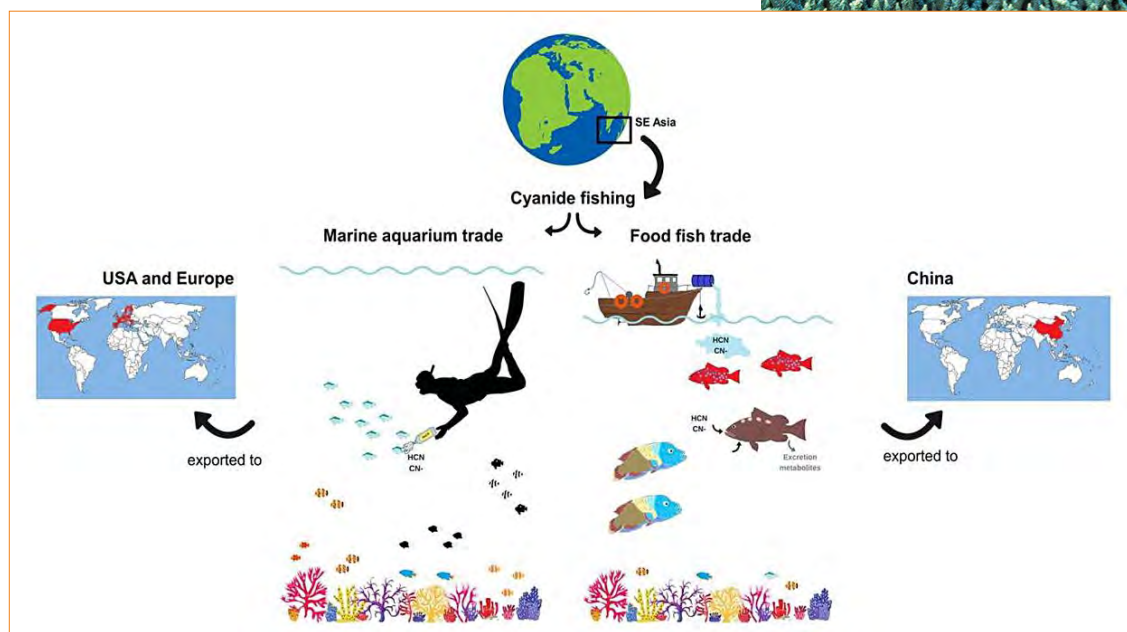
This is one of the chemical methods used to catch fish for the aquarium and food fish trade.

A Sodium Cyanide mixture is sprayed into the habitat to stun the fish, affecting not only the target species but other marine creatures, including coral and coral reefs.

The 2016 Centre for Biological Diversity Report found that 6 million tropical marine fish imported into US each year have been exposed to cyanide poisoning. Non-invasive, non-destructive and cyanide detection methods are urgently required for a sustainable fishing industry.



**Figure 3: Cyanide Fishing for global trade.**



ABOVE: Image source: World Ocean Review <https://worldoceanreview.com/en/wor-5/living-with-the-coasts/coastal-pressures/reef-fishing-at-the-limit-spermonde-archipelago/>

LEFT: Source: Research Gate Madeira, Diana & Calado, Ricardo. (2019). Defining research priorities to detect live fish illegally collected using cyanide fishing in Indo-Pacific coral reefs. Ecological Indicators. 103. 659-664. 10.1016/j.ecolind.2019.03.054.

## About Cyanide Fishing – What, Where, Why?

- Method of collecting live fish mainly for global aquariums and livefish food trade in Asia.
- Involves spraying a mix of sodium cyanide into the fish's habitat aimed to stun them.
- Practice harms target fish and other marine organisms, including coral reefs
- Believed to have originated in the Philippines in the 1950s
- Practiced mainly in saltwater fishing regions of Southeast Asia
- Grouper, wrasse and coral trout are among the main species captured.
- Results in the death of 90% of fish before they reach the retailer
- Is illegal in many countries, however laws are ineffectively enforced
- Prohibited in exporting countries surrounding the Indo-Pacific Oceans including Indonesia.



About 400 tons (360 t) of Chilean jack mackerel (*Trachurus murphyi*) are caught by a Chilean purse seiner off of Peru. Source: [https://commons.wikimedia.org/wiki/File:Chilean\\_purse\\_seine.jpg](https://commons.wikimedia.org/wiki/File:Chilean_purse_seine.jpg)



Source: [https://upload.wikimedia.org/wikipedia/commons/f/f4/Kapal\\_Nelayan\\_Purse\\_Seine\\_Number\\_Two.jpg](https://upload.wikimedia.org/wikipedia/commons/f/f4/Kapal_Nelayan_Purse_Seine_Number_Two.jpg)

## OVERFISHING

Overfishing has a negative impact on **aquatic biodiversity** as all living organisms play a role in maintaining balanced ecosystems. When fish become extinct it reduces species depending on them up the food chain such as birds.

There are three **types of biological overfishing**, such as growth overfishing, recruit overfishing and ecosystem overfishing.

### Types of Overfishing:

- **Ecosystem Overfishing** occurs when the balance of the ecosystem is altered by overfishing.
- **Growth Overfishing** occurs when smaller fish species are caught causing depletion in reef fish species, a food source for over a billion people.
- **Recruit Overfishing** occurs when the adult population lacks the reproductive capacity to replenish itself i.e. there are insufficient adults to produce offspring.

## GLOBAL

In 2018, the Food and Agriculture Organisation (FAO) estimated that approximately 33% of global fish stocks were overfished. The Mediterranean and Black Sea had the highest percentage of overfished stocks (62.2%), followed by SE Pacific (61.5%) and SW Atlantic (58.8%).

## SOUTHEAST ASIA

Across Southeast Asia 64% of the fisheries varies from medium to high risk of extinction from overfishing. Cambodia and Philippines are among the most adversely affected by overfishing.

## SATELLITE TECHNOLOGY MONITORING

Fishing vessels equipped with electronic devices, or "blue boxes", form part of the satellite-based vessel monitoring system (VMS). The blue box sends data about the location of the vessel to the fisheries monitoring centre (FMC). Vessels are also equipped with GPS transmitters which track the ship's speed and position.

### Geographical Inquiry into fishing methods:

- Gillnets
- Longlines
- Purse seine
- Pole and line
- Pots and traps
- Dredges
- Pelagic or midwater trawls

Learn more about the following fishing methods and their impacts through **Geographical Inquiry Activities** in the **Appendix**.