

The tsunami that swept across the Indian Ocean in December 2004 devastated coastal communities in 13 countries. The damage to lives, properties and livelihoods was staggering. Among the badly hit were Indonesia, India, Thailand and Sri Lanka – countries where the liberalisation of the fishing sector has contributed to the intensification of more destructive and exploitative commercial fishing. Clearing natural coastal defences for industrial aquaculture production is a growing trend in these parts of Asia. Along with increased vulnerability of coastal and surrounding rural communities, marine biodiversity is in serious decline, and there is an escalating dispossession of the small-scale and artisanal fishing sector. GRAIN investigates.

Fishing profits, farming disaster

the cost of liberalising Asia's fisheries

GRAIN



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The December 2004 tsunami killed more than 170,000 people and some 100,000 are still missing. In Thailand, the loss in the fishing industry alone was estimated to have totalled at least 500 million baht (US\$13m)¹ while damage to homes and lives remain beyond calculation.

Governments and aid donors were quick to say that countries affected were 'caught by nature's surprise'. However it later became clear that it was an event that could have been greatly mitigated had certain ecological functions – i.e mangrove areas that act as coastal defence – not been badly destroyed by unsustainable development initiatives like aquaculture.² In a study of satellite images

in Cuddalore, India, taken before and after the tsunami, exposed villages were completely levelled, but those behind the mangrove suffered virtually no damage. Scientists who went to Sri Lanka after the tsunami had similar findings: greater damage corresponded with greater extent of coastal development.

It seems that lessons from this are hard to learn. Industrial aquaculture continues to be pushed indiscriminately "because of massive funding and short-sighted development pressures by influentially powerful government and inter-governmental institutes like the World Bank, Asian Development Bank, USAID, and the UN's Food and Agriculture Organization (FAO)".³

1 - An internal report titled "Tsunami Impacts on Fisheries and Aquaculture in Thailand" jointly developed by staff of NACA, FAO, SEAFDEC and BOBP-IGO, January 2005, <http://strePDF.notlong.com>

2 - Mangrove Action Project, The Unnatural Natural Disaster, *Tsunami Action Alert*, undated, <http://eartsu.notlong.com>

3 - *ibid*



Niall Crotry

Tilapia: a very versatile group of fish which are used a lot in aquaculture as they are omnivorous and grow quickly.

Old practice, new investments

Aquaculture is an ancient practice that dates back to 3500 BC in Ancient China. Early 'records' found in hieroglyphics indicate that the Egyptians of the Middle Kingdom (2052–1786 BC) had taken a shot at it as well as the Romans, who established the earliest form of oyster culture.⁴ Today industrial aquaculture produces one-third of all the fish and a quarter of all the shrimps eaten.

By 2020, it is expected that aquaculture will produce nearly half of all fish production and four-fifths of this will be supplied by developing countries. With declining catches from open sea, and the prospect of high foreign exchange earnings from farmed shrimp exports, more governments are turning their attention to aquaculture.

Even in a tightly controlled economy like Vietnam, aquaculture was the first economic sector to be liberalised.⁵ The country currently has over 900,000 hectares of water surface for aquaculture, of which two-thirds is devoted to shrimp production.

Elsewhere in Asia, the business sector is investing heavily in the aquaculture boom. In Thailand, at least 19 companies are involved in aquaculture production including Charoen Pokphand one of Asia's largest agri-industrial corporations.⁶ This corporation is already the world's largest supplier of Black Tiger Shrimp and farms Tilapia both in Thailand and Burma where it has 8,000 hectares of Tilapia aquaculture.

The presence of these companies in aquaculture means that small players with small capital are unable to compete or become swallowed by larger ones. For example in areas where no more land is available for aquaculture, Charoen Pokphand can simply take over smaller producers under contract farming arrangements.

Destructive enterprise

With aquaculture expansion come the growing concerns about the damage it causes. The tsunami in December 2004 highlighted the inequitable trade-off between increasing aquaculture areas and compromising the resilience of coastal communities against natural calamities. It is believed that up to half of all mangroves in the region have been lost to tourist resorts, urban expansion, and, most notably aquaculture. Over the past 20 years countries have systematically destroyed these natural barriers in the name of aquaculture development.⁷ The mangrove areas are cleared and transformed into enclosed ponds where select species – like tilapia, milkfish or shrimp – are raised in a controlled, monocultural environment.

Apart from being a natural barrier to storms and tsunamis, mangrove forests also act as a breeding ground for many types of fish. The loss of breeding ground effectively cancels out the natural reproduction cycle crucial to keeping biodiversity, and in maintaining the necessary balance of marine ecosystem.

"What has happened over the last several decades is that many mangroves have been cleared to grow shrimp ponds so that we, here in Europe, can have cheap shrimps," said Jeff McNeely, chief scientist of the Swiss-based World Conservation Union (IUCN) commenting about the tsunami.⁸

Fisherfolk also bear the brunt of the aquaculture expansion. As more areas get devoted to aquaculture, more fisherfolk become displaced from their livelihoods either physically or economically. In the Philippines, for example, the government's drive to modernise its fisheries has become synonymous

4 - Batis, J, History of Aquaculture, World Aquaculture, <http://histaqu.notlong.com>

5 - Nan Dhan Newspaper, Agro-forestry-fishery restructuring sees intensive development, 4 January 2006, <http://agforfi.notlong.com>

6 - Companies and Information by country, Fish Information and Services (FIS), <http://utopimun.notlong.com>

7 - Smith M, The right way to rebuild asia coastal barrier, 12 January 2006, [SciDev.Net](http://gasceded.notlong.com) <http://gasceded.notlong.com>

8 - The Biology Refugia, Cheap shrimp escalates tsunami devastation, 2 January 2005, <http://scimisee.notlong.com>

with the intensive establishment of aquaculture farms. But as it favours mostly commercial operators with large capital, many small-scale fisherfolk have been driven off their fishing areas or ended up becoming aquaculture farm workers. They are typically paid with low wages or receive a measly percentage from a sharing system that favours the owners.⁹

In Indonesia, the development of shrimp farms has been associated with human rights abuses, through land seizures, violent suppression of protests, and appalling labour conditions for shrimp farm workers.¹⁰ Yet despite this, the Indonesian government still makes a third of the remaining mangrove area available for conversion to shrimp ponds. But as the fisherfolk are displaced, so too is the knowledge on sustainable fishing practices.

High wastage culture

Aquaculture's impacts are not confined to coastal communities. As inland fresh water aquaculture also becomes popular, the priorities on resource utilisation directly impact on the agriculture sector as well. Land and water – resources that are shrinking in many agricultural areas – are being used up in fresh water aquaculture. In Thailand both these resources have been diverted in recent years to fuel the growth of the aquaculture industry. Nearly half the land now used for shrimp ponds in Thailand was formerly used for rice paddies.¹¹

Intensive aquaculture operations can also lead to water shortages. Raising one tonne of shrimp in a farm requires 50,000 – 60,000 litres of water. In some coastal areas, water diversion for shrimp ponds has lowered groundwater levels.¹² Pollution is also a serious consequence of this enterprise. Heavy concentrations of fish faeces, uneaten food, and other organic debris that are flushed into surrounding coast or river when water is replenished can lead to harmful algal blooms and oxygen depletion. In Thailand alone, shrimp ponds discharge some 1.3 billion cubic metres of effluent into coastal waters each year.¹³

At the end of the equation, what aquaculture takes in is much more than what it produces. It is estimated that roughly two kilograms of fishmeal is necessary to produce one kilogram of farmed fish or shrimp. For every kilogram of shrimp farmed in Thai shrimp ponds developed in mangroves, 400 grams of fish and shrimp are lost from wild captured fisheries. Nearly one third of the world's fish caught in the wild are transformed into fishmeal and fish oil, which are then used in

feeds for farmed fish.¹⁴

Yet despite all this, the push for aquaculture continues, and now includes the development of genetically modified (GM) fish.

Still a caged revolution?

The application of genetic engineering in aquaculture draws its inspiration largely from the Green Revolution in agriculture of the late 1960s. By creating early-maturing, disease-resistant fish species through the use of modern biotechnology, a corresponding increase in fish production will keep the world's population from hunger – a sort of 'blue revolution' in fisheries. At least this is the thinking, and probably the idea behind what the British public found out the UK government was secretly funding in 2001. Around US\$ 3.5 million of public funds were allocated by the UK government for the development of fast-growing carp and tilapia in India, Bangladesh, Vietnam, Thailand, Philippines, and some parts of Africa.¹⁵

Serious concerns were raised about the possibility of (the new species) outcompeting the wild species for food and other resources. Scientists voiced their concerns about GM traits from GM fish spreading into wild populations and how the fish could seriously harm the resilience of aquatic ecosystems. According to William Muir, a professor at Purdue University, once GM fish escaped into the open ocean, they are obviously much harder to control and can spread much faster than GM plants do on land.¹⁶ Even if GM fish are kept in safe pens, possibilities of escape due to human error or natural disasters like storms, which can destroy fish farms, are always there.

Despite these warnings, GM fish research and development has increased. At least about 30 laboratories in about ten Asian countries are actively engaged in GM fish research at the moment, a major chunk of which is on developing species for industrial aquaculture production. This involves developing character traits such as faster growth rate, disease resistance and increased environmental tolerance among common aquaculture species of carp, catfish and tilapia.

Bio-fantastic

Of the desired characteristics, fast growth seems to be an area in which scientists and researchers are making real headway. In Wuhan, China, Zuoyan Zhu of the Hydrobiology Institute of the Academia Sinica has created a fast-growing yellow river carp.

9 - Guste J, del Rosario-Malonzo J, *Women in Philippine Aquaculture*, IBON Foundation, December 2004, <http://enjansky.notlong.com>

10 - Anon, *Shrimp business destroys mangroves and livelihoods*, *Down to Earth* No. 58, August 2003, <http://tipburch.notlong.com>

11 - Mock G, White R, and Wagener A, *Farming Fish: The Aquaculture Boom*, *EarthTrends*, July 2001, <http://vulvalmy.notlong.com>

12 - *ibid*

13 - *ibid*

14 - Delgado C et al, *The Future of Fish: issues and trends to 2020*, WorldFish Center and International Food Policy Research Institute, 2003, <http://fish20.notlong.com>

15 - Various, *UK Secret GM Fish Trials "to feed the poor"*, 2 April 2001, <http://fishshh.notlong.com>

16 - Muir W, *The threats and benefits of GM fish*, *EMBO reports*, 5, 7, 654–659, 2004, <http://fishgm.notlong.com>





Mangroves: *The destruction of the mangroves has in part increased the destructiveness of a tsunami*

Researchers in Cuba and the UK have reportedly engineered tilapia to grow up to 300% faster. And the race for speed goes on. In Korea, they were able to develop a mud-loach that grows up to 35 times faster than normal.¹⁷

Not everybody's fish

But it remains unclear how the fisherfolk will gain from all these improved species. Are these fishes really being developed for their benefit?

With the genetic contamination concern, GM fish are being developed for the bio control of invasive species. The idea is to engineer a 'trojan gene' into GM fish and release them so that the transgene will find its way into the invading population. It has been reported that research to control introduced carp that have become a major problem in Australian rivers and lakes is close to being implemented.¹⁸

Meanwhile, GM fish are also being researched to provide medical products for humans – fish pharming. Already, a human blood-clotting factor used to treat some people with haemophilia and accident victims suffering serious bleeding has been produced using genetically modified fish.

Since 1987, there have been at least 11 applications for patents on fish by Japan, Europe and Canada, three of which have been granted already.²⁰ One is held by Nippon Suisan Kaisha & Mochida Pharmaceutical on a gene of the yellow-finned tuna for the production of an anti-hypertensive drug. Another is held by Britain and Canada, on growth hormone genes from sockeye salmon for the production of GM fish.

The future is likely to bring more improved species. Already scientists are reportedly working on genetically engineered virus-resistant shrimps for aquaculture. But we will be facing the same nagging question: whose end does it serve?

Trading people for profit

There are 40 million small-scale fisherfolk in the world who depend on the ocean's resources to feed their families. However, the trend in global trade puts their lives and livelihoods under constant threat. Under the WTO, industrialised countries

"We have a list of 20 other human therapeutic proteins that could be produced via fish to treat lung disease, liver problems, even tumours," says Norman Maclean of the University of Southampton in the UK.¹⁹

17 - Muir W, The threats and benefits of GM fish, EMBO reports, 5, 7, 654-659, 2004, <http://fshgm.notlong.com>

18 - *ibid*

19 - Avasthi A, GM fish produce cheap blood-clotting agent, New Scientist, 11 September 2004, <http://nsblocl.notlong.com>

20 - GeneWatch UK, Applications for patents on fish genes, (<http://patfish.notlong.com>) in: Patent applications: full list, A complete list of the applications for patents supplied to us by GeneWatch UK, *The Guardian*, 15 November 2000, <http://guafpa.notlong.com>



(like Japan, the US, and the EU whose fisheries sector enjoy domestic subsidies) could strike commercial agreements with developing countries to fish in their waters. Trade liberalisation policies such as “tariff reduction schemes” shift the incentives to commercial fishing towards foreign commercial trawlers. This has resulted in the serious depletion of marine resources and the sidelining of small-scale fisherfolk in favour of big commercial trawlers, as has been the case in the Seychelles, Indonesia and the Philippines.²¹

Since its membership of the WTO, the Philippines has liberalised its fishing industry. It has reduced tariffs for exploiting fisheries from 30% to 5%. It also issued a fisheries administrative order in 1999 which allows foreign fishing fleets to operate increasingly off the coast and bring imports in. Fisherfolk groups have legally challenged it in court, saying it would badly affect millions of small-scale fisherfolk in the country.

Already, Japanese trawlers fishing in Philippine waters have reportedly caused artisanal fish catches to shrink significantly over the years.²² Ocean resources have been depleted causing lowered productivity and consequently lowered income for fisherfolk. The Philippines’ fishing sector employs 1.6 million subsistence artisanal fisherfolk. Approximately 6 million people depend on the fishing industry for livelihood. But to date, an estimated 20% of small and medium scale fisherfolk have already lost their livelihoods.²³

The case of Indonesia is a bit different. Because of economic liberalisation, the Indonesian fishing industry has changed a good deal. In 2000 Indonesia’s wild shrimp production was third highest in the world after China and India. But since 2004, Indonesia has been flooded with shrimp imports from China and Vietnam. Low tariffs have made Indonesia vulnerable to dumping. Indonesia’s import tariffs on fish are very low – between 0% and 3% – while domestic fish are taxed at 5%. As a result, national businesses and processing industries buy cheap imported fish rather than local fish.

Trawl boats in the Indonesian island chain known as the Moluccas allegedly throw 90% of their catch back into the ocean in their search for profitable shrimp and tuna. According to SKEPHI, an Indonesian environmental NGO, the Indonesian government is merely relying on the illegal shrimp trawling industry to fulfil its high-earning export targets.²⁴

In Korea, it has been predicted that the country’s bilateral deal with the US will likely cause economic damage to the domestic fishing sector which could lose at least US\$51 million.²⁵ “With the launch of the FTA, the volume of imported fish would increase between 10–20% annually, causing deterioration in the already crowded fishery market” says Chung Myung-sang, a senior research fellow at the Korea Maritime Institute (KMI).

In India, the effect of trade liberalisation and fisheries development has had a big impact on women in the fishing communities. By modernising the sector, it has adopted technologies like trawling and purse seining, and expanded the industrial fleet. It left many without a livelihood. Traditionally fishing nets were woven locally using cotton yarn or other natural fibre. But this has been changed now. “The introduction of synthetic yarns and net-making machines has led to the displacement of thousands of people traditionally involved in these activities, many of whom were women.”²⁶ In Kanyakumari district of Tamil Nadu, India, the introduction of these machines reportedly led to the displacement of 20,000 women employed in this work.

At an International Symposium on Sustainable Fisheries and Trade in Hong Kong last year, fisherfolk groups demanded that WTO-members should ensure that liberalisation of trade should not pose any threat to the culture and traditional value of fisheries and fishing communities.²⁷ In a statement, they specified that special consideration should be given to the vulnerability of small-scale fisheries.

Tsunami debris

Looking at the post-tsunami rehabilitation in Indonesia, Thailand or Sri Lanka, one can say that the watermarks have already dried up. But the debris remains along the coasts long after everything has been cleaned up – they are the small-scale fisherfolk who are continuously being orphaned by this kind of development.

If there is one thing to be learned from this age of economic globalisation, it is that trade negotiations have left many governments deaf and blind to their own reality. Without knowing it, they are already trading their own people for profit.

Perhaps it is high time to go beyond conference statements and take other paths where fisherfolks’ voices will be much better heard.



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22 - PAKISAMA, *Fishers File Case to Nullify Gov't Order on Fish Imports*, 30 August 2004, *Pakisama Peasant Update*, <http://qumradua.notlong.com>

23 - *op cit* - Friends of the Earth International

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