

CHALLENGES AND OPTIONS FOR FUEL SAVING AND GHG REDUCTION IN S ASIAN SMALL-SCALE FISHERIES

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i. What is Small Scale Fisheries (SSF)?

Most fisheries in South Asia can be considered to fall under ‘small-scale’ category: 70-80% of marine fishing in countries like India is under ‘small-scale’ category. The term ‘small-scale’ itself – like ‘artisanal’, and ‘traditional’ – is quite difficult to define (and justify in several cases); needs to be used guardedly!

The contribution of SSF to GHG emissions – though rising over the years – is still considered to be miniscule in comparison with the other land- and ocean-based sources.

Increase in GHG emissions is intrinsically linked to the wellbeing of the natural resources and their economic performance – any discussion on GHGs (or climate change in general) needs to take account of the broader livelihood context prevailing in SSF.

ii. Where do GHG emissions occur in the small-scale fisheries?

GHG emissions in SSF occur primarily in three areas:

- At sea, where the pace, distribution and intensity of motorisation and mechanisation gathers momentum, displacing traditional operations involving sails, oars and other manual means of propulsion
- On the shore, in ice plants servicing fish preservation needs in marine fisheries
- Finally, at a slight remove from the SSF, though related to them, in seafood processing plants, involved in export processing

In aquaculture, usage of pumps operated by engines is another area where GHGs might be an issue, although the extent to which this is a problem cannot be quantified for various reasons.

iii. Why and how do SSF operations contribute to GHG emissions?

A number of factors are at work in the SSF operations (especially at sea) contributing to the GHG emissions.

A. Boat Design

Most SSF are served by local boat building facilities which are poorly equipped in terms of infrastructure, knowledge, skills and ability to provide technically competent boats. Cost-cutting

is the chief consideration, even to the extent of compromising on the quality of construction. In fact, this is considered the single most important reason for the relatively high mortalities at sea during cyclones and other natural disasters.

Size-shape-design of boats is not technically appropriate; boat builders – who are mostly poorly educated and have learned their skills ‘on the job’ – have very little understanding of basic boat building science. Consequently, boats keep increasing in size and shape, there are no efforts at streamlining the shape, and hardly any notice is taken of the increasing strain on engine

B. Boat engines

Engine horse-powers are arbitrarily selected; they are hardly ever commensurate with the requirement for the boat and are frequently either too high or too low.

The technology of boat engines hasn’t really evolved as well as that in their land-based counterparts (used in cars and motorcycles etc.). They continue to remain huge, cumbersome and highly inefficient – and largely out-of-date by current standards elsewhere.

Coupled with this is the widespread practice in many SSFs of using old, recycled or reconditioned engines. The engines tend to be very temperamental, contributing to high operational costs and loss of valuable fishing time during peak fishing periods, besides releasing high levels of GHGs into the environment.

C. Boat engine installation

Engines are not properly aligned in the construction process. This is further aggravated by use of inappropriate materials for critical constituents like piston shafts (use of cast iron instead of gun metal), propellers, couplings etc. leading to much energy wastage during transmission. Deck machinery – winches and haulers etc – are also improperly installed in many cases leading to demand for more power and excessive loads on engines.

D. Speed

Speed has become the norm in some SSF (e.g. West Coast of India, Sri Lanka), with higher HP engines with high fuel consumption putting *enormous loads on the engines despite being already too powerful*. The fishers suggest three reasons for the need for speed:

- To travel farther out than previously; with boats frequently fishing in offshore and deep sea waters, there is need for higher speed to travel to and from the fishing grounds.
- To beat competition with other fishers both to reach the fishing grounds and to land their catch, and finally,
- To enjoy the speed!

Emphasis on speed led to traditional propulsion mechanisms – sails and oars – being largely dispensed with in several fisheries, though sails continue to be used in some fisheries. On the

east coast of India, in the state of Andhra Pradesh, the fishing boats use both engines and sails, thus taking advantage of the winds whenever they are favourable.

E. Engine maintenance

There is hardly any maintenance for the boat engines. Temporary repairs take the place of regular maintenance to avoid immediate costs. This is aggravated by usage of adulterated fuels – despite knowing the impact such practices can have upon engines – leading to high levels of GHG emissions.

Similarly, the usage of lubricating oils is seldom based on the specifications of the manufacturers – incorrect grade oils are frequently used. More widespread is the recycling of old lubricants with predictable results on the engine performance.

F. Fishing methods

With growing need for fishing harder, trawlers keep using much bigger nets, which put much strain on the engines. New fishing gears like ring-seines require huge net and manpower to be carried onboard for their operation.

In other SSF, overloading of boats with excessive quantities of fishing nets is the norm: in order to cope with uncertain fish catches, the boats tend to carry a range of nets capable of targeting a wide variety of fish. This puts pressure on the capacity of the engine.

G. Fishing duration

The distance of fishing grounds, depth of fishing and the duration of fishing in most SSFs have increased enormously and – together with poor navigation systems onboard and the need to be constantly on the move while at sea – they lead to very high consumption of fossil fuels. Short layoff periods on the shore also reduce time for maintenance of engines, with only immediate repairs being attended to.

H. Human aspects

Though fishers agree in principle on their contribution to climate change, there is reluctance to accept the responsibility and take appropriate measures – the same fishers complaining of pollution also happen to own the boats they are complaining about!

More seriously, despite half-a-century of motorisation in India, engines and motorisation remain alien to the fishers. They tend to use them as long as they work, then cast them off in favour of another – recycled - engine! Reduction in government subsidies for replacement of engines also had an impact upon the capacity of fishers to replace their engines regularly.

Governments are hardly prepared to set and implement stricter standards on boat and engine design, construction, maintenance issues, and in controlling the unregulated expansion of the fishing fleets and their capacities.

i. The shore-based issues:

Many ice plants in S Asian context are built with outdated technologies and are poorly/badly designed (for effective insulation). They also suffer from frequent power fluctuations, and face uncertainties of demand, which reduces their capacity to streamline the activity either technically or economically.

Many seafood processing plants work at 20-25% capacity, which leads to unnecessarily (and uneconomically) high consumption of power and emissions of GHGs.

Some ways forward...

There is need for setting the SSF's own house in order. Given their near-total ignorance about GHG and its implications, as well as their own contributions to it, it is necessary to raise their awareness and ensure some community-based practices to improve efficiencies and curtail emissions.

Development and promotion of alternative propulsion systems is important. Use of sails continues in some SSF and is also coming back into vogue in others, but this needs more institutional support. Similarly, there is need for promoting solar power – as is happening on trial basis in some south Indian states – as a viable alternative to fossil fuels.

It has been claimed that promotion of GPS, satellite information and other navigational & fishing aids helps reach fishing grounds quickly and improve the operational efficiency, but this needs to be further examined.

The governments should take the lead in standard setting for requirements in boat building, engine powers and maintenance, and for regular repair/replacement as per current global and national environmental norms. The government support should extend to improving efficiencies of existing systems, for regulating uncontrolled increase in fishing fleets and their capacity.

Conclusion

The small-scale fisheries in South Asian context are important because they are a major supporter of livelihoods of a very large number of the poor people. The capacity – skills, knowledge, investments – of these people to make major adaptations is very limited, and requires to be enhanced significantly in order to reduce their dependence on potentially dangerous fishing and post-harvest systems.

It also needs to be understood that increasing GHG emissions are an outcome of a range of factors – biological, environmental, social, economic and political – that influence the life and livelihoods of the fishers; unless the wider spectrum of issues is also tackled simultaneously, their ability to cope with the challenge of GHG emissions remains very poor!