



# HOW TO INCREASE MARINE FISH PRODUCTION ?

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It is well reckoned in scientific and policy circles that fish production from marine capture fisheries of India has reached a plateau and that further increase from the presently exploited geographical areas is only a remote probability. In an earlier article, I had written that marine fisheries research *per se* will not result in increase in marine fish production. What is needed is translation of research results into policies, adoption of such policies and implementation of these both in letter and spirit in a way that proper knowledge - based interventions and management would result in a gradual transformation of the present open access and unregulated regime in a well managed and regulated mode, ultimately contributing to sustainability and perhaps to increased fish production.

Marine Capture fisheries sector is essentially one of exploitation of a natural resource without any inputs from the end users. In other words, there are no seed, feed,

fertiliser, disease management or growth management interventions that can be made by fisheries operatives or managers. The only intervention possible is management of the natural resource through control of exploitation rates in such a way that these regulations contribute to better resource resilience and long term sustainability of the resource.

The present annual yield from Indian seas is 2.71 million metric tons (2006 estimate by CMFRI). Introduction of multiday fishing and deep sea fishing can result in increasing the yield to a maximum of 3.0 million metric tons. There is no scope for increasing the yield beyond this from the presently fished grounds and therefore the future efforts should be to sustain the yield at the present levels by adopting suitable management interventions.

Mariculture is a new activity for the country. However, the costs involved in developing open sea mariculture is high and only high

value species can be considered for this activity. Also, ownership and leasing rights of open sea for mariculture are not in place in the country. Thus, production enhancement through mariculture will be only marginal for the present. However, the extensive lagoons and backwaters of the Indian coasts offer unlimited scope for the spread of small scale cage culture of finfish similar to the culture systems in Vietnam. These potential areas could be highly profitable production centres if both governmental and developmental agencies take the initiatives.

However, there are many other avenues for increasing the yield from the marine capture fisheries. For the sake of objectivity and brevity, I would use a table format to present my views on this. A list of proposed interventions and anticipated impacts are presented in the following Table for the consideration of the maritime States of India.

**Proposed Interventions and Anticipated Impacts**

State/UT	Intervention	Scope for Increased Production
<b>GUJARAT</b> About 575,000 mt of marine fish are produced annually. Production from single day trawling is about 48,000 mt and multiday trawling is about 150,000 mt. Presently the overcapacity in fishing efforts and unregulated fishing using fine mesh nets are adversely impacting the fish populations. Interventions aimed at managing the fishery can result in long term benefits and positive growth. In order to increase production, 8 interventions are proposed for the State of Gujarat, aimed at managing the fishery. They can result in long term benefits and increased production and positive growth. These interventions are presented in the next two columns.	1.Reduction in discards of fish in multiday fishing.	Production can increase by about 280,000 tonnes annually.
	2. Implementation of minimum legal size for pomfrets.	Production can increase by 3000 tonnes of pomfrets annually.
	3. Regulation of Dolnet fishery for Bombay Duck through mesh size regulations.	Production of Bombay Duck can be increased by 10,000 tonnes annually.
	4. Regulation of fishing pressure by reducing multiday fishing.	Additional 30,000 tonnes of finfish can be harvested annually.
	5. Enforcing minimum legal size for lobsters.	Additional 136 tonnes of high value lobsters can be harvested annually.
	6. Introduction of coastal mariculture of shellfish in racks in about 18,800 ha ( 5% of potential area).	26,00,000 tonnes of shellfish (shell on weight) can be produced annually (@ 4.25 tonnes per 300m <sup>2</sup> ).
	7. Introduction of open sea cage culture of finfish . (10 cages of 5m dia).	20,000 kg of high value finfish can be produced annually.
	8. Coastal mariculture of seaweeds.	250,000 tonnes of seaweeds can be produced annually by adopting seaweed culture.
<b>MAHARASHTRA</b> Present annual marine fish production is about 3,34,000.	1. Mesh size regulations for dol net fishery.	An increase in yield of 20,000 tonnes is anticipated through this after a lag period of half year.







<p><b>(Contd from previous page)</b></p> <p>tonnes. Single day fishing yields about 49,000 tonnes while multiday fishing brings 1,45,000 tonnes. Dornets contribute about 11,500 tonnes of Bombay Duck. Overcapacity of fishing effort is the major concern in this State affecting fish production. Reducing juvenile and bycatch can result in visible changes in the yield. Increase in production can be achieved through management interventions only, although mariculture can initiate a new line of coastal fish production.</p>	2. Reducing capture of juveniles of pomfrets.	An increase of 1700 tonnes can be achieved through this intervention after a lag period of half year.
	3. Overcapacity reduction by reducing multiday fishing.	Additional 29,000 tonnes can be harvested through this intervention.
	4. Implementing minimum legal size of lobsters.	100 tonnes of additional production of high value lobsters can be achieved annually.
	5. Reducing bycatch from the fishery by 50%.	This can yield additional 8500 tonnes annually.
	6. Coastal mariculture of mussels and oysters.	Mariculture production of mussels and oysters can yield additional 5,68,000 tonnes by bringing in 4,000 ha (5% potential area) for shellfish culture.
	7. Introduction of open sea cage culture of finfish. Ten cages of 5m dia.	20,000 kg of high value finfish can be produced annually.
	8. Mariculture of seaweeds.	About 5,000 tonnes of seaweeds can be produced annually from the coastal seas tonnes.
	<p><b>GOA</b></p> <p>Present marine production is only 100,000 tonnes annually.</p>	1. Reducing multiday fishing.
2. Reducing discards.		Additional 2,500 tonnes of fish can be harvested annually.
3. Coastal mariculture of mussels and oysters.		Additional 1,31,000 tonnes can be produced if 5% of potential area is converted into mussel/oyster farms.
<p><b>KARNATAKA</b></p> <p>Present marine fish production is 240,000 tonnes. Single day fishing yields 32,500 tonnes and multiday fishing 99,000 tonnes. Bycatch and juvenile fishing are major setbacks. Extensive coastal lagoons and backwater areas are potential farming sites.</p>	1. Reducing discards from multiday fishing.	Additional yield of 20,000 tonnes of fish can be anticipated.
	2. Reduction of fishing efforts of multiday fishing crafts.	Additional yield of 20,000 tonnes can be achieved.
	3. Shellfish mariculture in 400 ha (5% of potential areas).	Additional production of 56,800 tonnes can be achieved annually.
	4. On bottom mariculture of clams.	4,000 tonnes annually can be additionally produced if 2% of potential areas (8,000ha) are brought under clam culture.
	5. Introduction of open sea cage culture of finfish. Ten cages of 5m dia.	20,000 kg of high value finfish can be produced annually.
<p><b>KERALA</b></p> <p>Present production is 592,000 tonnes, of which multiday fishing accounts for 138,000 tonnes and single day 53,000 tonnes. Juvenile fishing and bycatch are major issues. Use of destructive fishing gears is adversely affecting resource stability. The State produces 10,000 tonnes of mussels and 1000 tonnes of oysters annually at present. There are 50,000 ha of potential area for mussel and oyster farming in the coastal waters.</p>	1. Implementing the already existing total ban of Ring Seine.	Additional annual yield of 1,60,000 tonnes of pelagic fish can be obtained through this intervention.
	2. Reducing discards from multiday fishing.	Additional 28,000 tonnes can be obtained annually
	3. Reducing discards from single day fishing.	Additional 2900 tonnes can be obtained annually.
	4. Total ban of destructive minitrawls along coastal waters.	Additional production of 20,000 tonnes of high value shrimps can be obtained.
	5. Diversification of fishing by excess fleet of trawlers.	Additional production of 5,000 tonnes of high value oceanic tuna can be obtained.
	6. Increasing mariculture areas to 10% of potential areas (50,000 ha).	Additional 7,00,000 tonnes of mussels and oysters can be obtained.
	7. Seaweed culture in coastal waters.	Additional 1,00,000 tonnes of seaweeds can be produced.
	8. Introduction of open sea cage culture of finfish. Ten cages of 5m dia.	20,000 kg of high value finfish can be produced annually.
<p><b>TAMIL NADU</b></p> <p>Present marine fish production is about 362,000 tonnes. Multiday fishing provides 64,000 tonnes and single day fishing 82,000 tonnes. Excess fleet size and regulation of destructive fishing are major issues. There are several opportunities for</p>	1. Reduction in excess fleet and diversification of excess fleet.	Additional 30,000 tonnes of oceanic tuna, pelagic sharks and bill fishes can be obtained.
	2. Regulation of multiday fishing.	Additional yield of 12,800 tonnes of demersal fish can be obtained.
	3. Total ban on destructive gear <i>Thalluvalal</i> .	Additional 3,500 tonnes yield of high value green tiger shrimp can be obtained.

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<p><b>PUDUCHERRY</b></p> <p>Present production is 12,500 tonnes.</p>	<p>1. Promotion of gill netting for pelagics.</p>	<p>Additional yield of 3,000 tonnes can be obtained.</p>
<p><b>ANDHRA PRADESH</b></p> <p>Annual production is 2,19,000 tonnes. Multiday trawls yield is 72,600 tonnes and single day trawls 18,500 tonnes of fish. Reducing fishing pressure through regulation of multiday trawlers and promotion of more gill netters can yield higher fish production. Mariculture also provides opportunities in the coastal waters.</p>	<p>1. Regulating multiday fishing.</p> <p>2. Diversification of excess trawlers for tuna fishing through addition of longlining system.</p> <p>3. Promotion of gill net fishing.</p> <p>4. Seaweed culture in coastal waters.</p> <p>5. Introduction of open sea cage culture of finfish. 10 cages of 5m dia.</p>	<p>Additional yield of 15,000 tonnes of fish can be obtained.</p> <p>Additional yield of 35,000 tonnes of oceanic Tuna, finfish and Oceanic Sharks can be obtained annually.</p> <p>Additional yield of 25,000 tonnes of high value large pelagics can be obtained.</p> <p>Additional 1,00,000 tonnes of seaweeds can be produced.</p> <p>20,000 kg of high value finfish can be produced annually.</p>
<p><b>ORISSA</b></p> <p>Annual production is 89,000 tonnes. Multiday fishing yields 48,000 tonnes and single day fishing 9,000 tonnes. Most areas are declared NO FISHING areas.</p>	<p>1. Promotion of gillnet fishing.</p> <p>2. Introduction of cage culture of finfish.</p>	<p>Additional yield of 10,000 tonnes of pelagics can be achieved.</p> <p>Additional 20,000 kg of high value finfish can be produced annually.</p>
<p><b>WEST BENGAL</b></p> <p>Annual production is 1,83,000 tonnes. Multiday fishing yields 16,500 tonnes. Mechanised gill netters yield 79,000 tonnes. Hilsa production is about 35,000 tonnes. Small meshed bag nets are most destructive gears used.</p>	<p>1. Mesh size regulation in the bag net.</p>	<p>Additional production of 10,000 tonnes of pelagic fish can be obtained, mostly Bombay Duck.</p>
<p><b>LAKSHADWEEP</b></p> <p>Present production is about 8,000 tonnes of Tuna. Diversification and upgradation are the key interventions needed.</p>	<p>1. Diversification of Tuna fishing from pole and line to long-line. Targeting the presently unexploited Yellowfin Tuna.</p> <p>2. Introduction of more number of pole and line vessels in the Northern Islands.</p>	<p>Additional yield of 20,000 tonnes of Yellowfin Tuna suitable for Sashimi can be obtained.</p> <p>Additional yield of 10,000 tonnes of Skipjack Tuna can be obtained.</p>
<p><b>ANDAMAN &amp; NICOBAR</b></p> <p>The present production is only 20,000 tonnes including Tuna. This is only 10% of the estimated potential. Diversification and upgradation are essential for any increase in yield.</p>	<p>1. Longlines for Yellowfin Tuna.</p> <p>2. Pole and line for skipjack Tuna.</p> <p>3. Open sea cage culture. Great scope for finfish culture in floating cages. 100 cages of 5 m dia may be installed for finfish culture.</p> <p>4. Seaweed mariculture in about 11,000 ha of potential area.</p>	<p>Additional yield of 25,000 tonnes of Yellow Fin, Pelagic Sharks and Billfishes can be obtained.</p> <p>Additional yield of about 10,000 tonnes can be obtained.</p> <p>270 tonnes of high value finfish can be produced annually.</p> <p>Additional yield of 3,00,000 tonnes annually can be obtained.</p>

### CONCLUSION

The above estimated potentials may be on the higher side because there are many 'ifs and whens'. However it may be reckoned that at least a good part of the projected

production figures can be achieved if the proposed interventions are put in place. What is needed is a strategic action plan involving the stakeholders, especially at the grass root levels. With the NFDB in place,

it should not be difficult to initiate interventions aimed at converting the projections in to reality.

**Note :** The views presented here are personal of the author and do not reflect those of the organisation represented.

