



Food and Agriculture Organization
of the United Nations

Fishing Technology and Operations Team
Fisheries and Aquaculture Division
Food and Agriculture Organization of the United Nations

Project background and objectives

Stakeholder meeting: Sri Lanka

19 August 2022
by Raymon van Anrooy

Outline

- 1 Climate change and fisheries
- 2 Project introduction
- 3 Improving fishing vessel performance when adapting to climate change
- 4 Expected project results in Sri Lanka
- 5 Mission tasks and implementation
- 6 Some conclusions

Climate change and fisheries

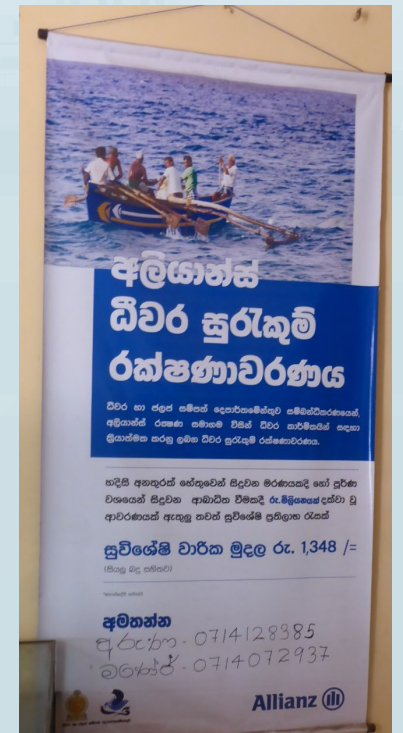
Negative effects of climate change are evident

- Floods, sea level rise
- Less predictable sea conditions
- Higher waves, storm surges, cyclones intensity
- Warmer ocean water



Negative effects on fisheries include:

- reduced fish abundance – distribution of stocks change & damage to critical habitats
- reduced fish productivity & reduced catches
- safety of fishers compromised
- damage to fishing gear and fisheries infrastructure
- increase in operational costs
- threats to fisherfolk livelihoods



Climate change adaptation and mitigation in fisheries

Adaptation measures:

1. use of climate smart fishing technologies
2. early warning systems
3. improve fish value chains & market diversification
4. improve fishing vessel safety (through design and practice)
5. climate proof fisheries infrastructure
6. awareness and capacity building of fishers on adaptation approaches
7. mainstream climate change into fisheries policy and management



Mitigation measures:

1. reduce greenhouse gas emissions - alternative fuels/energy sources
2. reduce fossil fuel use - energy efficiency
3. access to affordable life and vessel insurance



Project introduction

FAO project “Responsible use of fisheries and aquaculture resources for sustainable development” (GCP/GLO/352/NOR)

Project component 2: Assist partner countries and key stakeholders to adapt to climate change effectively and secure sustainable socio-economic development.

Title of component 2 activity in Sri Lanka:
Fishing vessel design adaptation to climate change



Impact expected:

Reduced numbers of fatalities and fishers lost at sea in small-scale fisheries.

Objective:

Increase the safety of vessels used in small-scale fisheries to adapt to climate change.

Project introduction

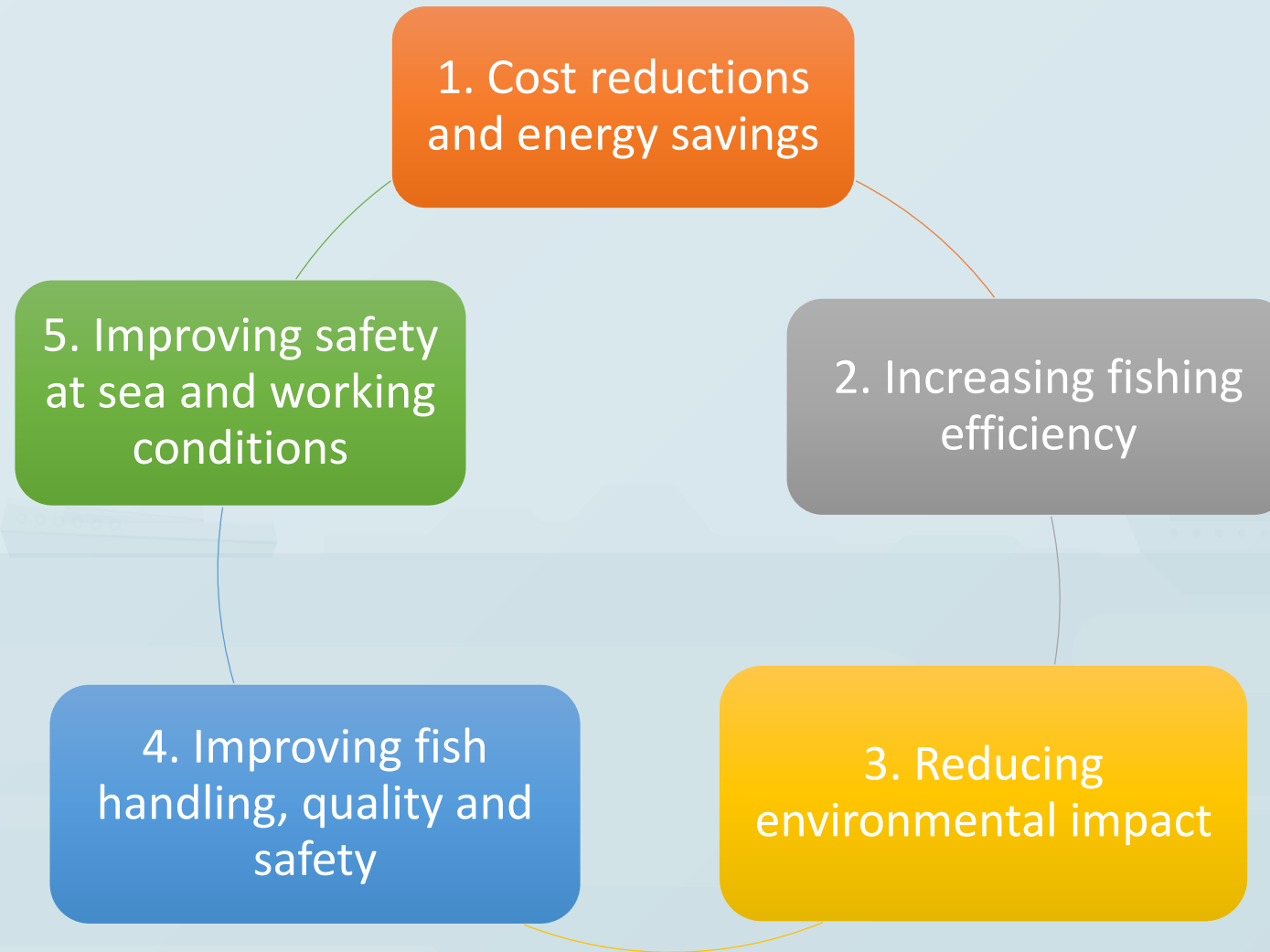
To increase safety at sea small-scale fishers need:

- 1) Training in safety awareness, measures they can take and safety/communication equipment use.
- 2) Safe small-scale fishing vessels that:
 - Have a structurally sound hull construction (meet construction standards)
 - Be unsinkable (with built-in buoyancy, and water discharge/ drainage)
 - Have self-righting capacity (depending on design)



Improving of fishing vessel performance when adapting to climate change

Five areas for improvements



1. Cost reductions and energy savings (A)

- ✓ **Cheaper fuels**



- ✓ **4-stroke outboard engines + modern 2-stroke**

- ✓ **Improvements in engine efficiency – ECAs**

IMO Worldmap for ECA's (Emission Control Areas)



1. Cost reductions and energy savings (B)

- ✓ Propulsion system improvements
- ✓ Vessel hull design – bulbous bow shape
- ✓ Larger vessels – longer at sea – transshipment



2. Increasing fishing efficiency (A)

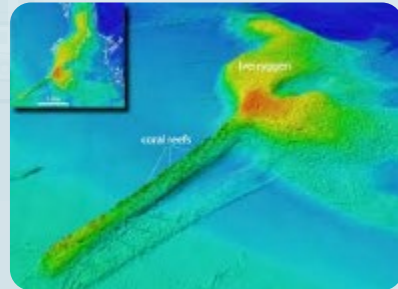
✓ GPS



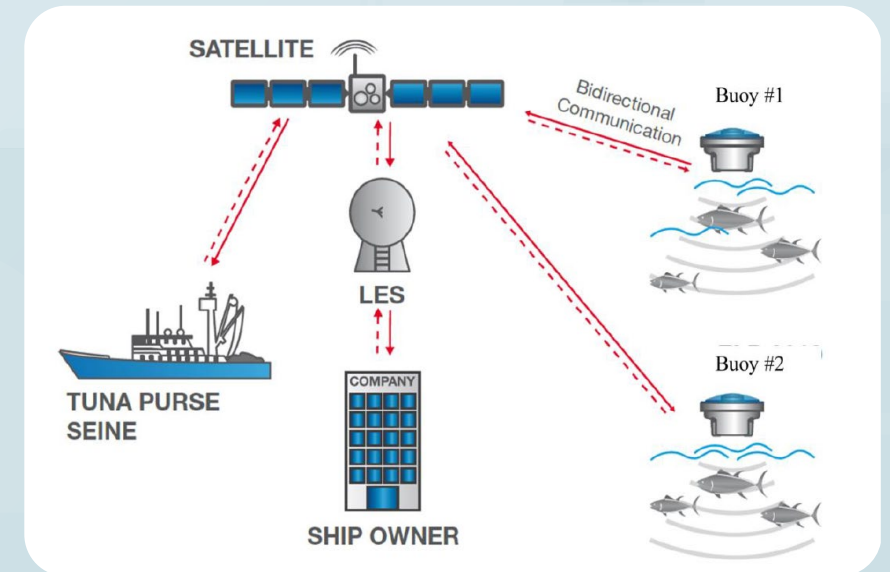
✓ Fish Finders



✓ Seabed mapping technology



✓ Fish Aggregating Devices (FADs)



2. Increasing fishing efficiency (B)

- ✓ **Biodegradable and collapsible traps**
- ✓ **LED light use in night fishing**

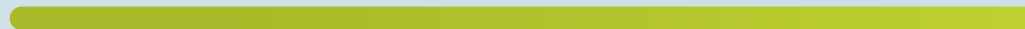
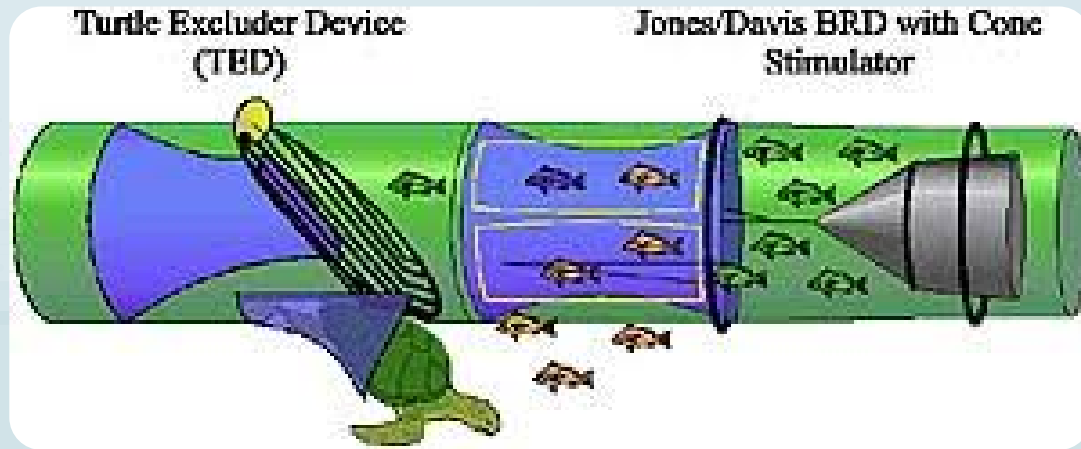


- ✓ **Multi-purpose fishing vessels**



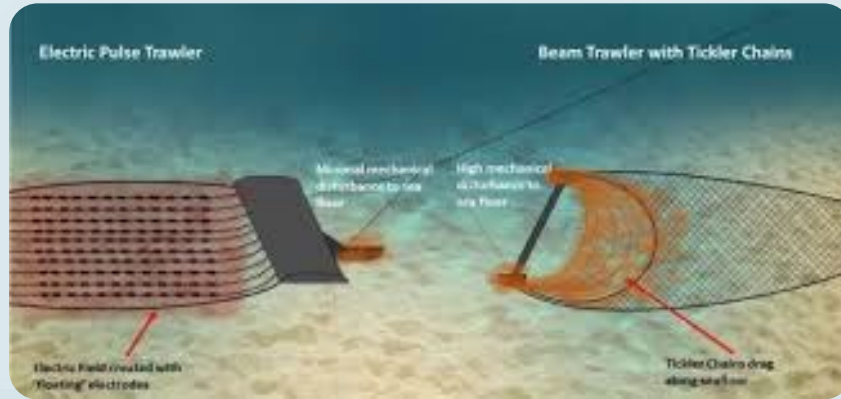
3. Reducing the environmental impact of fisheries (A)

- ✓ **Bycatch Reduction Devices (BRDs)**
- ✓ **Turtle Excluder Devices (TEDs)**



3. Reducing the environmental impact of fisheries (B)

✓ Electric Pulse Trawl

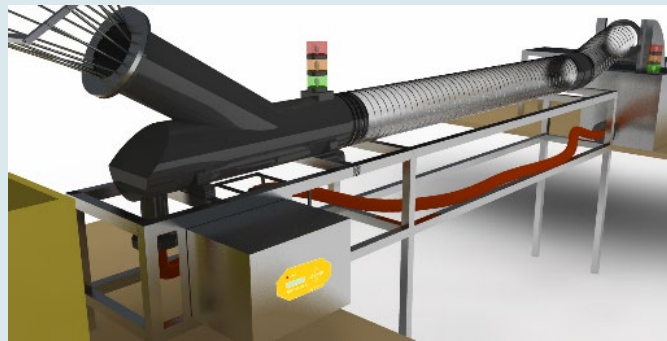


✓ Circle hooks



4. Improving fish handling (A)

- ✓ Killing of fish/ electric stunning/ bleeding

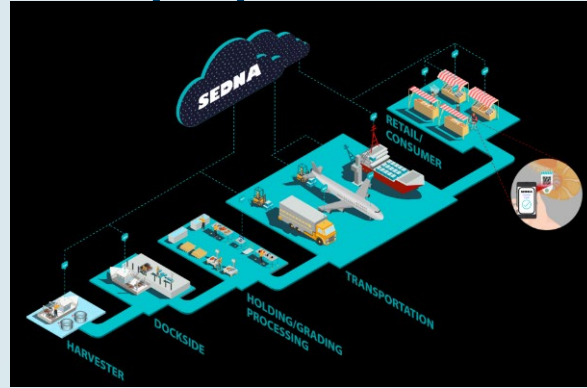


- ✓ Computerized weighing/scaling/grading

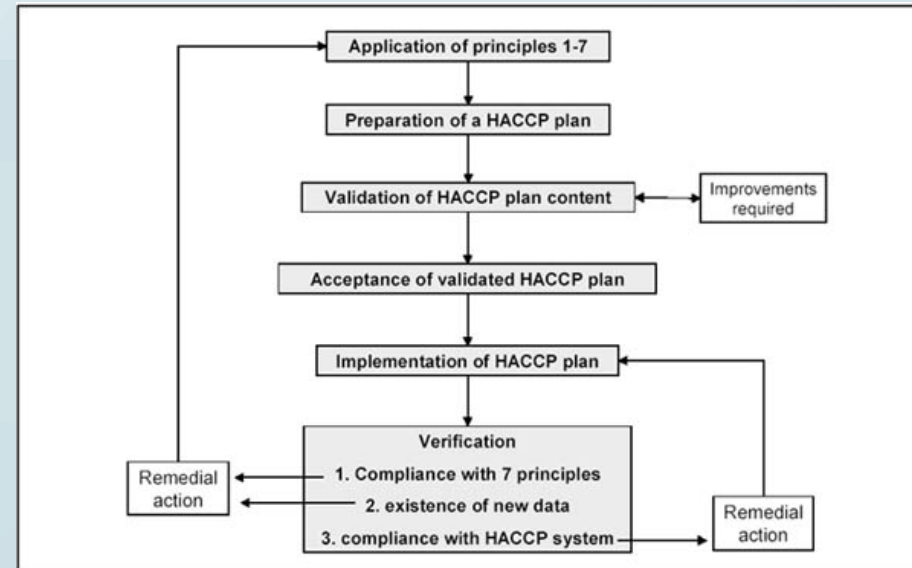


4. Improving fish handling (B)

- ✓ Traceability systems starting on-board

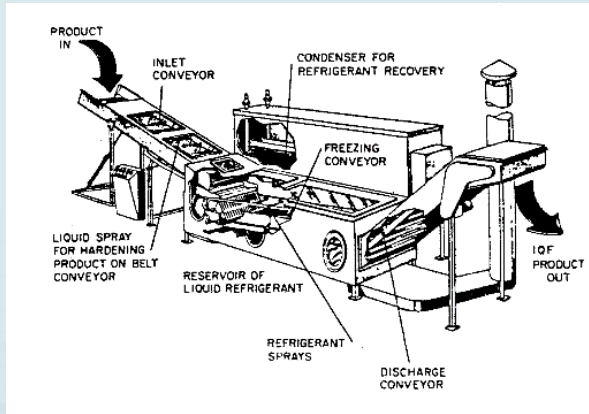


- ✓ Quality control systems



4. Improving fish handling (C)

- ✓ IQF, freezing and glazing technologies, refrigerated seawater systems (RSW)

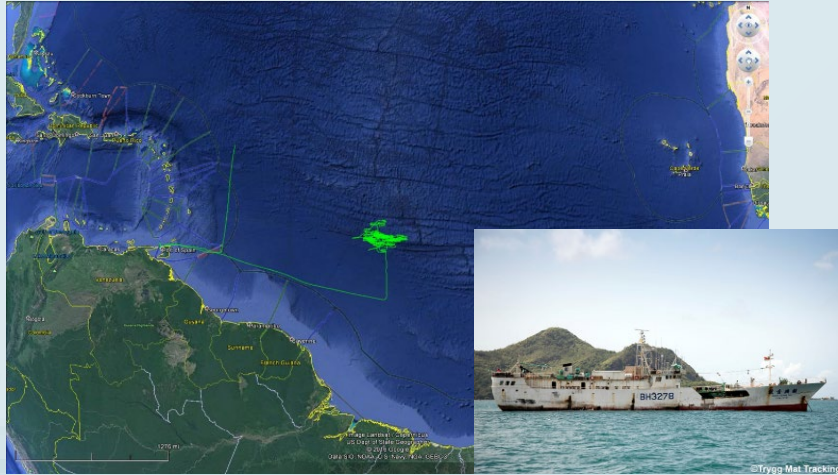


- ✓ Reduced energy consumption in freezing, processing

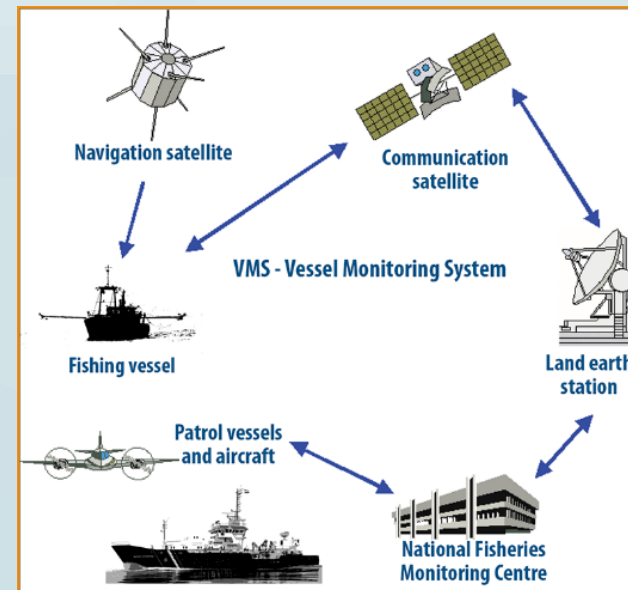


5. Improving safety at sea and working conditions (A)

- ✓ Automatic Identification Systems (AIS) and Vessel Monitoring Systems (VMS)

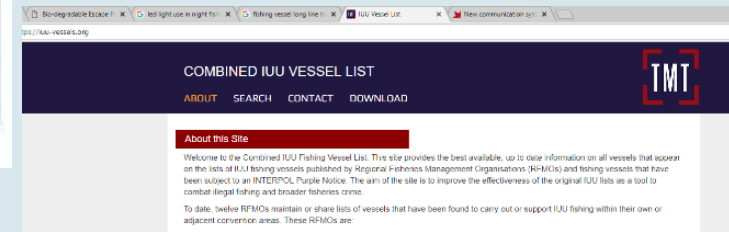


longliner CHEN HSING NO. 1

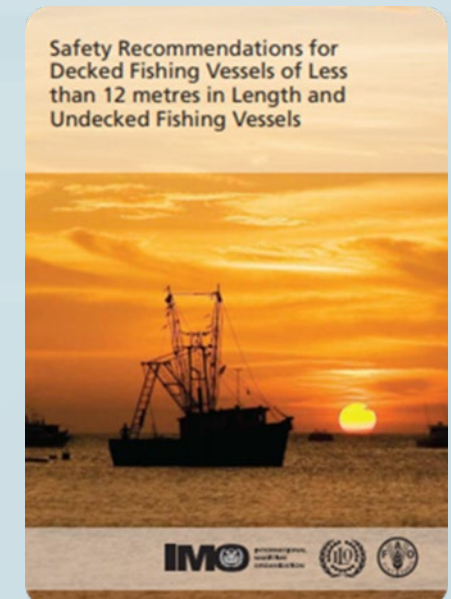
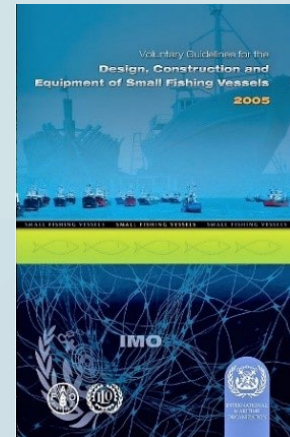
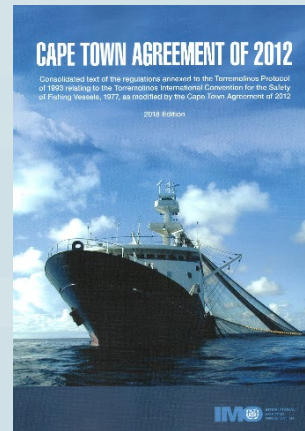
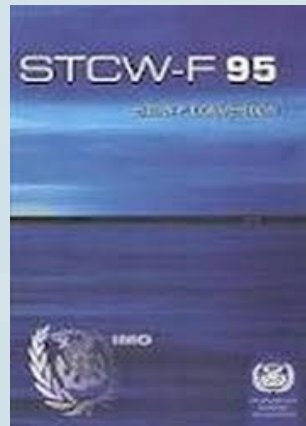


5. Improving safety at sea and working conditions (B)

- ✓ PSMA, Global Record, e-logbooks, regional vessel registries, IUU vessel lists

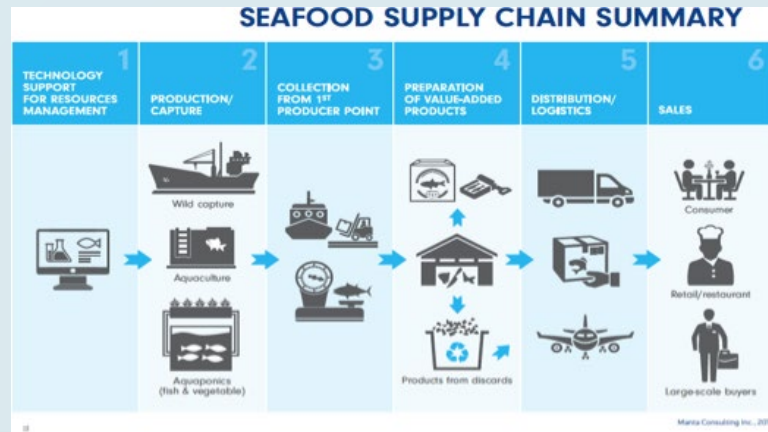


- ✓ STCW-F 1995, ILO Work in Fishing Convention, Cape Town Agreement – Training – Vessel Design



5. Improving safety at sea and working conditions (C)

- ✓ Vertically integrated value chains - fishing multinationals



- ✓ Life jackets and life rafts



If you can swim the Bering Sea, you're a better man than me. **AND YOU AREN'T.** Angus Iversen

Today's low-profile PFDs are comfortable, don't tangle in gear and extend survival time in the water. Choose yours at livetobesalty.org. Then make it part of your standard on-deck gear.

LIVE TO BE SALTY

5. Improving safety at sea and working conditions (D)

- ✓ Solar panels – support communication and lighting



- ✓ VHF radio, mobile phones, satellite phones, Emergency Position Indicating Radio Beacon (EPIRB)



Expected project results in Sri Lanka¹

1. A safe design for small-scale open (un-decked) FRP fishing vessels of 7 to 9 meter, available in English language.
2. A safe design for small-scale decked FRP fishing vessels of 9 to 15 meter available in English language.
3. Two FRP fishing vessels constructed in Sri Lanka, tested and provided to fishing cooperatives as demonstration vessels.
4. Moulds available at local shipyards for construction of more vessels of the same types.
5. Step-by-step fishing vessel construction manuals for the vessels in 3 languages.
6. Step-by-step vessel construction videos available on FAO's YouTube channel. At least 5 short videos



¹ from originally agreed project proposal.

Mission tasks (15-19 August)

1. Visit various boat builders/shipyards and identify which boat builders would be suitable to contract for the vessel mould and prototype construction
2. Visit at least 3 fishing communities to discuss with fishers about their preferred boat designs for an undecked vessel of around 7m and a decked vessel in the range of 9 -15 m.
3. Discuss and agree with DFAR, FAO Sri Lanka and other stakeholders about the preferred vessel designs and their specifications.
4. Update the project work plan for this activity.
5. Draft the contract for issuance of a request for proposal/invitation to bid, to be issued by FAO in early September.

Mission implementation

Team from Department of Fisheries and Aquatic Resources & FAO

Visits conducted:

- 4 stakeholder meetings in fishing communities
- 8 fishing boat builders
- 2 fishing ports

Locations:

- Colombo
- Negombo
- Kalpitya
- Chilaw
- Kandakuliya
- Kalutara



Some mission conclusions

Small-scale undecked FRP fishing vessels

- Affordable, but lack adequate safety measures
- Boat builders commonly copy each other's designs – limited variation
- Most common vessel sizes: 19.5 ft and 23 ft
- Small innovations can improve safety, stability, working conditions, vessel quality, vessel lifespan, gear deployment, and fuel efficiency.

Multi-day decked FRP fishing vessels

- Safe design, but lack of adequate safety equipment and gears
- Boat builders construct similar longliner/gillnetter vessels of sizes 42 & 59 ft → 55 ft is preferred.
- Fishers are hesitant to accept vessel layout changes.
- Compulsory refrigeration system installation is a challenge for <50 ft vessels.
- Innovations in hull design (bulbous bow) can improve fuel efficiency.

Thank You

Any questions or observations?

Raymon van Anrooy

Senior Fisheries Officer

Fishing Technologies and Operations Team (NFIFO)

Raymon.vanAnrooy@fao.org