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Marine litter: Attitudes and practices among fishers in Northern Norway

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Results gathered during three research projects

- 2016-18: REMAFISK (Reduce marine litter from the fishery fleet)
- 2017-19: RE-D-USE (“New knowledge for reduction and utilization of marine waste from fisheries”)
- HAVPLAST 2018-19 (Marine plastic from the Norwegian seafood sector – mapping, quantification and prevention)

	Partnership in the RE-D-USE project	Country
Research	Nordland Research Institute	Norway
	SALT Lofoten	Norway
	NORCE	Norway
	Luzin Institute for Economic Studies, Kola Science Centre	Russia
	Ocean Safety Research - Marine Institute	Canada
Fishery sector	The Norwegian Fishermen's Association	Norway
	The Norwegian Coastal Fishermen's Association	Norway
	The Norwegian Fishing Vessel Owners Association	Norway
	Fishing Industry Union of the North	Russia
Schools	Bodin Secondary School and Maritime College	Norway
	Lofoten Secondary School and Maritime College	Norway
	North Cape Secondary School and Maritime College	Norway
Circular economy	The Marine Recycling Network	Norway





Background and objectives

- Background
 - In the Barents Sea region fisheries contribute a high portion of marine litter.
 - Prevention is the most cost-effective approach to this challenge.
 - Commercial fishers were an under-researched group of stakeholders when it comes to marine plastic pollution
- Objectives and approach
 - Work with fishers to identify causes and solutions
 - Study fishers' attitudes and practices towards marine litter
 - Explore how fishers perceive the problem of marine litter and how their perceptions, in turn, influence their behavior and practices





Data collection

- A total of 21 interviews with fishers in Northern Norway in the period June 2017 to January 2019
 - Vessel size: 35-230 feet vessels
 - Equipment: Trawl, harpoon, nets, long line, jigging, cages
- Survey distributed to all members of Norwegian fishers unions Autumn 2017. Closed May 2018.
 - 197 responses.
 - 70 responses on paper collected during one annual meeting of a fishers union and in fishing harbours in Svolvær, Henningsvær and Tromsø
 - 127 electronic responses
- On board field observations

Vessel size and type of gear of interviewed fishers.

Vessel size (feet)	Number of interviews	Interviewees and type of gear
40 or fewer	6	F8: Jigging, longline, crab cages F11: Net, longline, jigging F13: Net, jigging F14: Net, seine, longline F17: Net, longline F20: Seine
41–50	6	F5: Longline, net, seine F9: Net, crab cages, longline F10: Net, crab cages, longline F12: Net, longline F15: Net, seine F21: Longline, net, jigging, seine
51–100	4	F1: Trawl F2: Trawl net F3: Net, longline F16: Net
More than 100	5	F4: Trawl net, seine F6: Trawl net F7: Seine, trawl net F18: Trawl net, seine F19: Seine





Problems for operation

- nets can be caught up in boat propellers
- plastic bags can clog water intake systems
- fishing gear can be damaged if it attaches to old, lost gear
- waste on hooks and in gears are a hassle
- fishers' reputations are threatened by litter. Depend on consumer perceptions that seafood is healthy and clean



Photo: Trond Arntzen (https://www.nrk.no/nordland/_-torsken-var-tynn-og-skral_-sa-jeg-skjonte-nesten-at-noe-var-galt-1.13456456)

“A picture of fish with plastic will destroy this image”





Practice at sea

- In the past, almost everything was thrown into the sea including spill oil and batteries.

“Ten years ago, it was common, because things disappeared. It was more like ‘out of sight, out of mind.’”

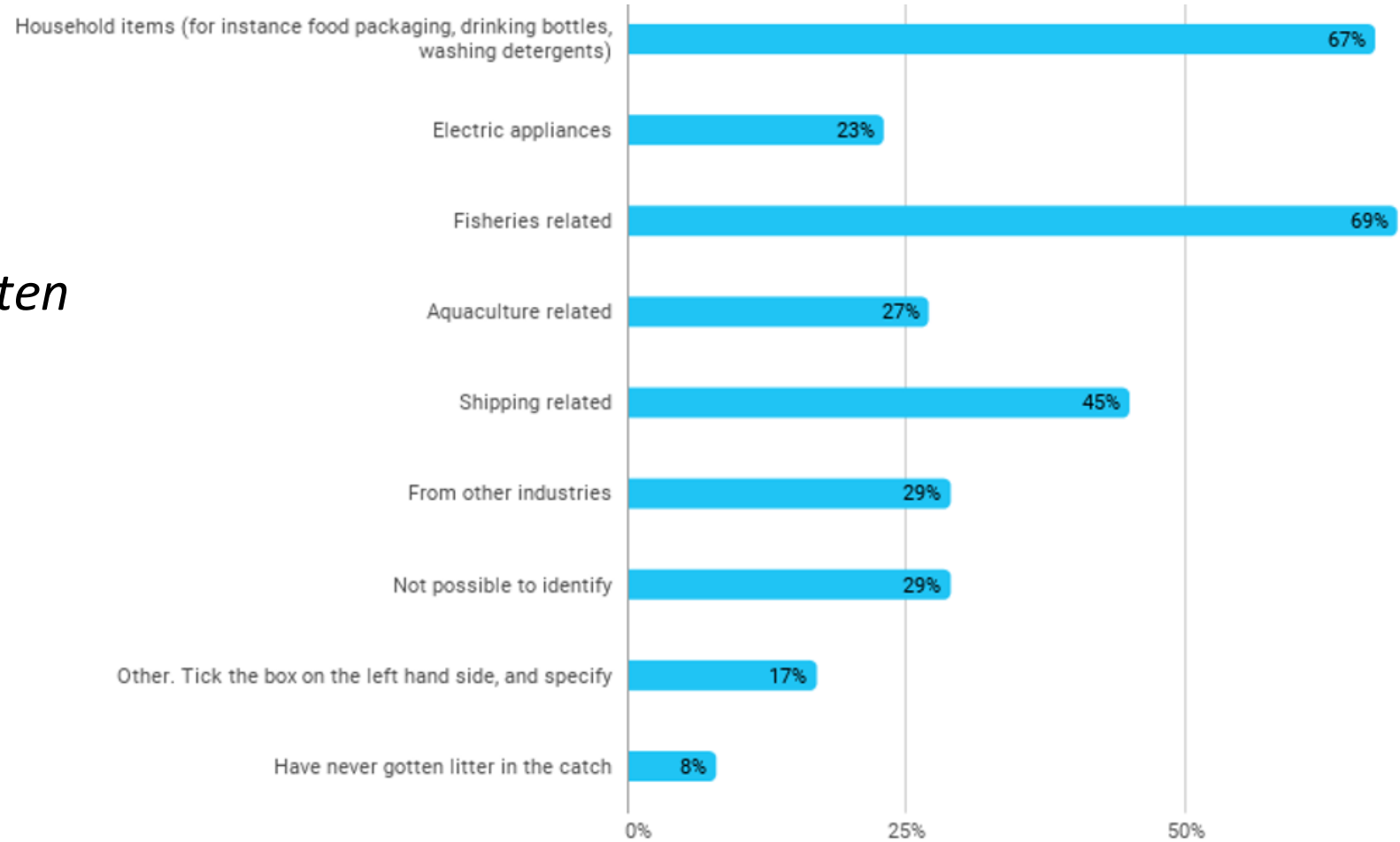
- Improved during last years. The younger generation is more aware.
- The amount of litter that most likely is due to poor waste handling (e.g. cut-offs) indicate that working to improve attitudes and creating better systems for securing waste onboard has a large potential to reduce marine littering





Practice at sea

Items that most often intentionally are thrown overboard





Practice at sea - sorting

- Fishers reported varied practices when it came to sorting waste onboard.
- Space onboard one issue
- However, the main reason fishers forego sorting is the inadequate facilities in harbours and at fish landings to received sorted waste



“Everything is thrown into residual waste”

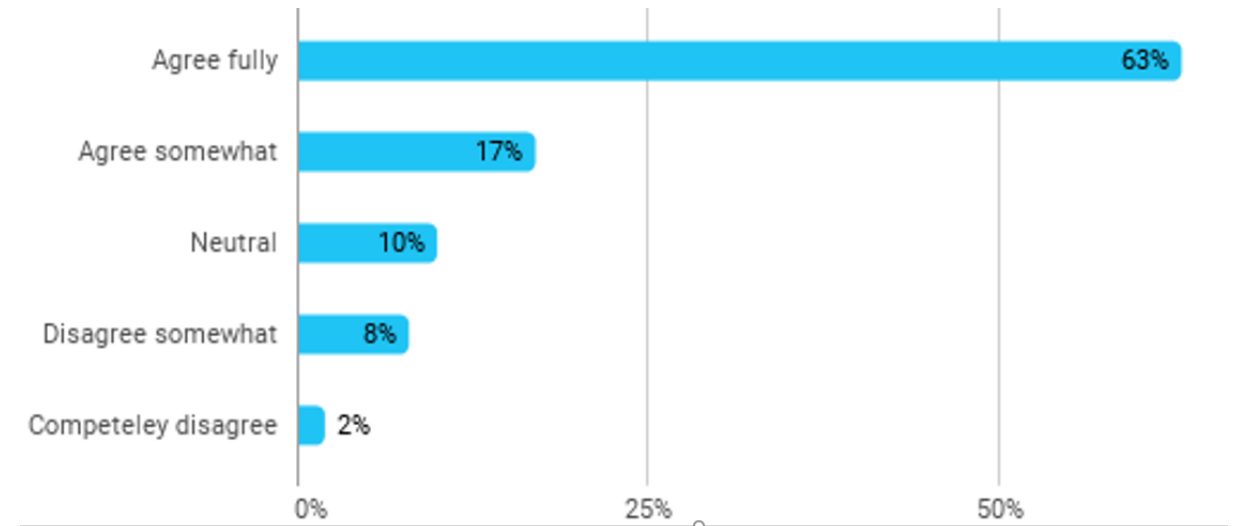




Reasons for the reduction in littering

- changing awareness and attitudes
 - media coverage (*“News about the whale was a wake-up call”*)
- better routines for waste management onboard vessels

There is enough space on board to handle and sort waste



Large difference between coastal and ocean going vessels.
The largest vessels agree 79%, coastal vessels 25%-50%

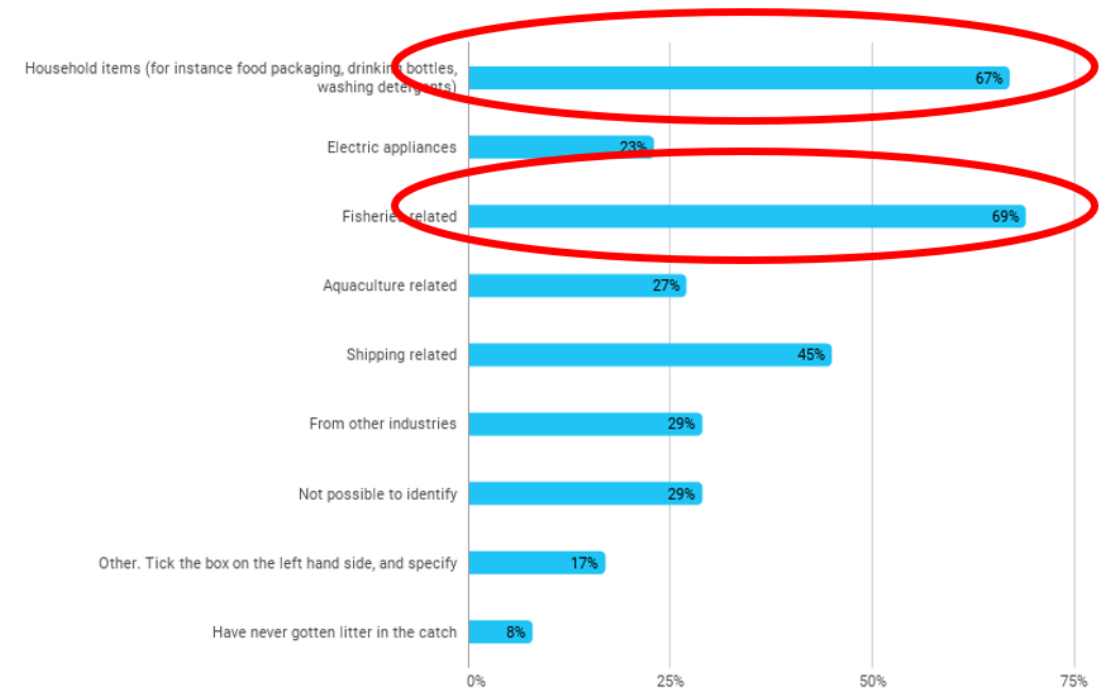




Litter caught at sea

- Fishers regularly catch other peoples waste in their gear
- Fishers expressed differing viewpoints about the possibilities of collecting and storing it

What types of litter have you had in your catch?



“It can be challenging on some occasions. But I think that it relates to attitudes. ... Whether [litter] is taken ashore is much about attitudes,”

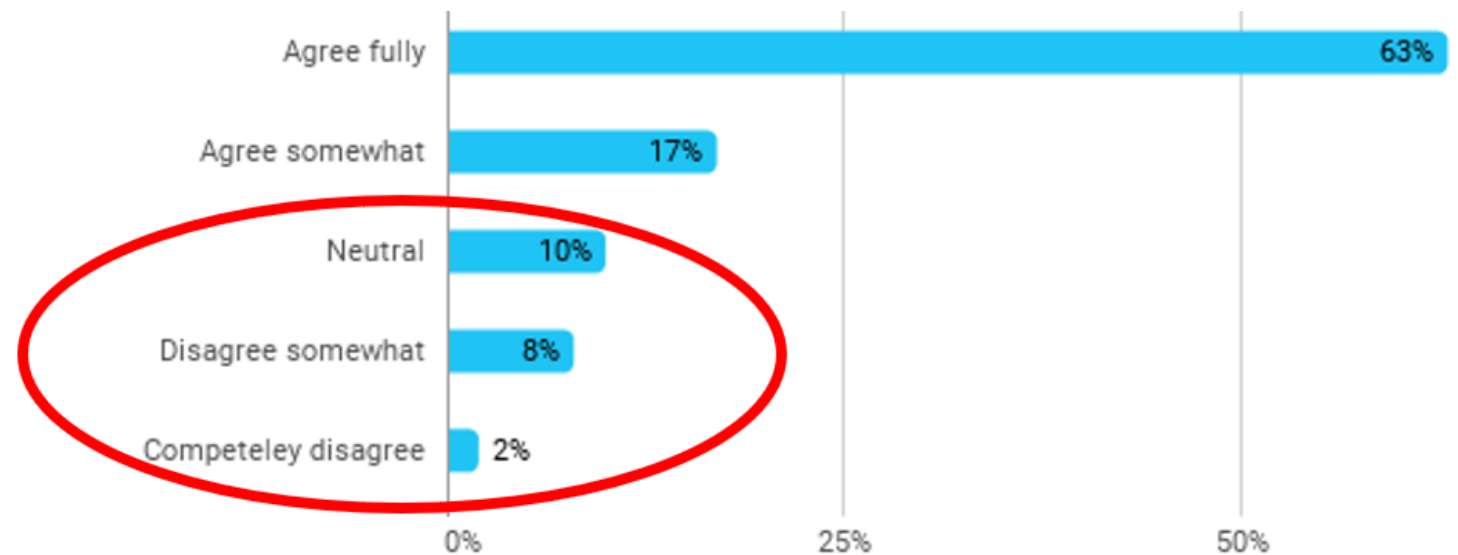




Litter caught at sea

- More problematic to manage than household waste. Can be large volumes.
- Costs time and money to bring to harbour. Easy to throw back?
- Many harbors do not offer services for collecting discharged fishing gear.

I take on board the litter in the catches and dispose of it on land



Fishers claim that the cost of adequately disposing of marine litter, in addition to the time and effort it takes to collect it, disincentivizes them from retrieving it at all.





Litter caught at sea

“If we have a chance to collect litter that can pose a risk to vessels or operations, we do it,”

- The size of vessels and the availability of waste management facilities in harbors are described as two important factors that influence waste management and storage onboard.

“It is a mix of attitude change and how easy it is to throw away waste onshore”





Harbour facilities

- According to fishers, the quality of waste facilities varies substantially
- Fishers have little motivation to store waste onboard if it cannot be delivered in the harbor,
- And they have no incentive to sort waste if everything will eventually be thrown into the same container.
- Waste management can be time-consuming, as sometimes fishers have to spend time finding containers for waste

“Not much sorting in the harbor. They usually have large containers that collect everything.”





Harbour facilities

- Fishers reported that it is not uncommon for waste containers to be full, locked, or difficult to access
- Fishers believe this problem exists because other users of harbor areas are disposing of waste in these receptacles.
- The problem of insufficient capacity worsens in seasons of high demand, when the tourism industry also makes use of such facilities.
- Smaller harbors usually offer fewer options for delivering and managing waste

“Why should we take waste to land if no one there takes care of it?”

“When we go to a port and pay NOK 150-250 a day, I expect to be waste facilities to be included in that price.

And if it is not included, they could have increased the price so that you do not pay separately to get rid of the waste”





Harbour facilities – used and caught fishing gear

- Fishing gear with recycling potential is treated separately from other types of waste
- Nofir collects fishing nets. But not available in all harbors, and the volume of waste that would justify pickup by the company is much larger than what individual fishers collect.
- Praise Nofir's, but state that it is the duty of the public sector to arrange facilities for the delivery of fishing gear, and that authorities currently fall short of this responsibility.
- Fishing for Litter a valuable service but partnered with only a few harbors in the Barents area





Conclusions

- What currently prevents many fishers from improving their waste management practices is the institutional setup that governs waste systems.
- The lack of motivation on fishers' parts appears to be associated more with frustration than with ignorance.
- Waste management practices onboard depend not only on the design of routines and systems in the vessels, but also on the quality of the waste management facilities in harbors and at fish landings.





Conclusions

- Changes in attitudes and practices onboard will not promote reduction of marine litter unless these initiatives are combined with well-designed facilities for receiving waste onshore.
- Moreover, the quality of waste management facilities has a feedback loop effect, where the effectiveness of waste management in harbors continually influences the attitudes and practices of fishers' marine litter management.





Conclusions - measures to reduce marine litter

Suggested measures	Description
Standardize waste management systems and improve infrastructure in harbors	<ul style="list-style-type: none">• Allow for delivery of fishing-related gear in all harbors;• Design facilities to be available and accessible with sufficient information and sorting opportunities;• Learn from best practices: e.g Svolveær, Røst, Dønna, Tromsø, Senjahopen, Tromvik.
Improve cooperation between fleets, harbors, and waste management actors	<ul style="list-style-type: none">• Promote close cooperation across stakeholders to improve waste facilities in harbors;• Foster a dialogue between foreign fishing organizations whose members operate in the Barents Sea.
Expansion of the Fishing for Litter program	<ul style="list-style-type: none">• Allow fishers to deliver litter that they have caught in their fishing gear without expense• Deliver found/recovered fishing gear to its owners.





Acknowledgment

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