Reduction of marine waste from fisheries: Dialogue with and education of fishers

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«New knowledge for reduction and utilization of marine waste from fisheries» (RE-D-USE)

• Background
  • In the Barents Sea region fisheries contribute a high portion of marine litter.
  • Prevention is the most cost-effective approach to this challenge.

• RE-D-USE objectives
  • Work with fishers to identify causes and solutions
  • Develop an educational program to reduce waste and gear loss
  • Investigate the potential for circular economy ventures based on marine waste as a resource
13 partners

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<th>Partner</th>
<th>Country</th>
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<td>Nordland Research Institute</td>
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<td>SALT Lofoten</td>
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<td>Ocean Safety Research - Marine Institute</td>
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<td>The Norwegian Fishermen’s Association</td>
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<td>The Norwegian Coastal Fishermen’s Association</td>
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<td>The Norwegian Fishing Vessel Owners Association</td>
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<td>Fishing Industry Union of the North</td>
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<td>Lofoten Secondary School and Maritime College</td>
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<td>North Cape Secondary School and Maritime College</td>
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<td>The Marine Recycling Network</td>
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A total of 22 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
- Attitudes toward marine litter, waste management on board and in the harbours, marine litter reduction measures

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
Results from interviews and survey

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

• Improved during last years. The younger generation is more aware.

• Concern for loss of reputation with Norwegian fisheries depending on the image of clean fish from clean oceans.
Discharged fishing gear

• More problematic to manage than household waste.
  • Can be large volumes.
  • Fishers regularly catch other peoples waste in their gear – costs time and money to bring to harbour. Easy to throw back?
• Many harbors do not offer services for collecting discharged fishing gear.
Harbour waste management - key suggestions

• Learn from best practice: Svolvær, Røst, Dønna, Senjahopen, Tromsø, Tromvik
• Delivering waste at the fish landing facility is a convenient solution
• Improved options, e.g. expansion of the Fishing for litter program for discharged/caught fishing gear
• Sorting possibilities.
• Uniform system in all harbours to create predictability

• «Attitudes/awareness and how easy we can dispose of waste in the harbour is interlinked»
What types of litter have you had in your catch?

Most frequently household and fisheries related items.
Items that most often intentionally are thrown overboard

- Household items (for instance food packaging, drinking bottles, washing detergents) - 67%
- Electric appliances - 62%
- Fisheries related - 69%
- Aquaculture related - 27%
- Shipping related - 45%
- From other industries - 23%
- Not possible to identify - 23%
- Other: Tick the box on the left hand side, and specify - 17%
- Have never gotten litter in the catch - 8%

Again: Household and fisheries related items, such as ropes and wires.

Coastal vessels are more prone to throw overboard than ocean going 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%.
I take on board the litter in the catches and dispose of it on land

- Agree fully: 63% (105 respondents)
- Agree somewhat: 17% (29 respondents)
- Neutral: 10% (16 respondents)
- Disagree somewhat: 8% (14 respondents)
- Competeley disagree: 2% (4 respondents)
Creating a compact educational module for integration into marine safety training

To maximise impact, questionnaire responses were analysed in a Theory of Planned Behaviour framework.
Example of divergent responses:

Do you agree or disagree with the following statements? - Marine litter will probably not cause lasting damage

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage</th>
<th>Respondents</th>
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<tbody>
<tr>
<td>Agree fully</td>
<td>8%</td>
<td>13</td>
</tr>
<tr>
<td>Agree somewhat</td>
<td>3%</td>
<td>8</td>
</tr>
<tr>
<td>Neutral</td>
<td>12%</td>
<td>19</td>
</tr>
<tr>
<td>Disagree somewhat</td>
<td>20%</td>
<td>33</td>
</tr>
<tr>
<td>Completely disagree</td>
<td>55%</td>
<td>90</td>
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Based on responses that were divergent/variable and/or did not agree with reality, the following topics were chosen for the module:

1. **Extent of marine plastic pollution**
2. **Persistence of plastics in the environment**
3. **Impacts of marine litter on aquatic life, particularly commercial fishes and local fauna**
4. **Known local sources of litter**
5. **Challenges of cleanup and importance of prevention**
The module: 15 min presentation + 45 min practical workshop

Practical component:
Litter collected from heavily polluted beach in Lofoten

Collected litter sorted into samples of different categories of litter, e.g.:
- Rope cut-offs
- Sanitary items
- Bottles
- Pieces of fishing nets
- Styrofoam

Total of 14 categories

Assignment → in groups of 2-4:
1. Review items given
2. Discuss origins
3. Discuss prevention
Module tested at the Lofoten marine safety training centre in January 2019

Module was well received by participating fishers and instructors

Feedback indicated practical portion was highly useful. Presentation considered impactful.

Centre will use module again

Additional sets of litter samples need to be prepared to implement module at additional centres
Conclusions

- First large scale data collection among fishers on attitudes, challenges and solutions for marine littering from fisheries gave valuable new knowledge.
- Used to formulate new policies and strategies for mitigation.
- Gave baseline for development of well received new education module for mandatory safety training for fishers.

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