



Popular science summary of the PhD thesis

PhD student	Nurul Huda
Title of the PhD thesis	Scale Modelling of Trawl Seabed Interaction
PhD school/Department	National Institute of Aquatic Resources

Science summary

Bottom trawling accounts for around 25% of global wild fish capture which contributes significantly to food security. But this productivity comes with environmental costs. As a trawl gear is dragged along the seafloor, it can disturb sediments, damage benthic habitats, and increase fuel use and greenhouse gas emissions. As concerns grow over ecosystem protection and sustainable fishing practices, the demersal fishing sector is under pressure to develop fishing gear with lower seabed impact.

Small-scale model testing in flume tanks is a common way in the fishing gear design and development process. However, the current model testing approaches do not realistically capture how fishing gear interacts with the seabed. This creates a major gap between laboratory testing and real fishing conditions, making it harder to predict gear performance and slowing the uptake of more environmentally responsible designs.

This PhD research tackles that gap by developing a more realistic flume tank testing framework that includes seabed interaction as part of early-stage trawl design. The study explores which gear components are most vulnerable to snagging on seabed obstacles, how seabed type and ground gear weight influence towing resistance and trawl geometry, and which modelling approaches best reproduce real seafloor conditions.

By improving how trawl gear is tested before it reaches commercial use, this research can support smarter gear design, reduce fuel consumption, limit seabed disturbance, lower the risk of gear loss, and contribute to safer and more sustainable demersal fisheries.