MINOUW

Case study results

2.3 - North Agean purse seine, Kavala, Greece

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SUMMARY

A comparison of fisheries discards in the North and the Central Aegean Sea fleets for the period 2003-2008 revealed great differences in discards ratio at the fishery level. Researchers identified some differences in fishers' strategies and practices, which contribute to the lower discarding in the North Aegean Sea purse seine fishery. In particular, an update of the discards rate based on the most recent available data was performed, underlying causes of the low discards rate in North Aegean Sea with a focus on environmental factors, ecosystem factors and fishing techniques used by the local fishermen were identified, low-discards fishing practices were disseminated through the participation in a fishermen's exchange program. In North Aegean Sea, the catch composition together with the environmental conditions and the fishing techniques used by the local fishermen lead to very low discards rates.

CASE STUDY RESULTS

Type of intervention

After the meetings with local purse seine fishermen participating in the Project and their insistence that the discards rates in the fishing grounds of Kavala where the local fleet operates are very low, a data analysis was carried out by the Hellenic Center for Marine Research. Actually, the estimated discard's percentage for North Aegean was confirmed to be approximately 1.8% of the total catch in terms of weight. Given the very low discards rate, which would be impossible to decrease, the initial case study's objectives were adjusted in accordance to the findings.

Aim of the experiment

Update of discards rate based on more recent data;
Identification of the underlying causes of such exemplary performance with a focus on environmental factors (weather conditions, currents), ecosystem factors (catch composition) and fishing techniques used by the local fishermen;
Use of case study as a best practice, demonstration of the fishing practices and replication in other parts of the European waters/world.

Main activities carried out

The following steps included the preparation of an official report regarding the underlying causes of the low discards rates in close collaboration with the Hellenic Center for Marine Research, as well as the participation of the local fishermen in an exchange programme with purse seine small pelagic fishermen operating in Portuguese waters, which was held in Faro, Portugal from 20 to 23 March 2017.
Update of discards rate based on more recent data and identification of the underlying causes of the low discards rates in North Aegean Sea Purse Seine (PS) Fishery

Purse seines targeting small pelagic fish are generally characterised by low discards ratios (Discards/Total Catch) compared to other gears in the Mediterranean Sea. An analysis of the Greek PS catches for the period 2003-2008 reports a discards ratio of 4.6% (independent of species) for the fishery in the Aegean Sea. However, this analysis was based on pooled data from samplings in two different areas, the North Aegean Sea (gulf of Kavala, Strymonikos gulf and parts of the Thracian Sea - including MINOUW CS 2.3) as well as the Central Aegean Sea (Saronikos gulf).
An in-depth analysis of these data during the MINOUW Project following field work and stakeholder consultation, revealed important differences between these two areas; the discards ratio independent of species is much higher in the Central than in the North Aegean Sea (16.79% and 1.74% respectively). As concerns discards ratios of the target species, anchovy and sardine, they are also lower in the North Aegean, however these differences are less profound and discarding of these species is still in low levels. These findings urged the need to further explore the reasons why the North Aegean Sea PS fishery is characterised by low discards ratios compared to the Central Aegean. Therefore, in the aim to identify differences that may affect catch and discards composition, the two ecosystems and the fisheries in terms of species composition, environmental characteristics and fishing techniques have been compared.
Use of case study as a best practice, demonstration of the fishing practices and replication in other parts of the European waters/world
As part of the dissemination of the fishing techniques used by PS fishermen and in order to reduce discards, a fishermen's exchange programme between Portuguese and Greek fishermen was organized last March in Faro, Portugal.
Two purse seine fishermen from Kavala, together with two members of WWF Greece's staff (the marine officer and the fisheries officer) visited Olhão, a neighbouring port to Faro, where they spent some time at the landing site, the fish auction as well as the fish market. Two researchers from the local Research Institute (CCMAR) joined us and provided information on the way the fish auction works, the common marketable species and the management plan for purse seiners in Portugal. Moreover the team had the opportunity to experience first-hand purse seine fishing in the Atlantic, during which the Greek fishermen observed the slipping technique, applied by Portuguese fishermen on an experimental basis with the aim to reduce mortality of the fish escaping the net. A round table was also organized, where the participating stakeholders (researchers, fishermen and WWF representatives) shared ideas and impressions, exchanged know-how on technical issues, acquired a better understanding on processes such as co-management and, at the end of the day, realised the benefits of close collaboration and knowledge dissemination.

Main results

The results can be summarized as follows:
• Large differences in catch composition of purse seine fishery between North and Central Aegean: Four species make up 95% of the catch in the North Aegean while in the Central Aegean this percentage is usually made up of 8-9 species.
• The Aegean Sea ecosystem is generally characterised as an oligotrophic region; however, the Northern part of the region is among the most productive areas in the Eastern Mediterranean Sea. Differences in bathymetry, hydrography and chemical

composition of the water masses, as well as the width of the continental shelf denote differences in the pelagic habitat, which affect species composition in the two study areas, resulting to a more homogeneous catch in the North. More specifically, in the North Aegean, anchovy and sardine constitute >83.3% of the catches as recorded in onboard surveys and ~90% of landings, as opposed to 25-35% and 32-50% respectively in the Central Aegean. Four species make up 95% of the catch in the North Aegean, while in the Central Aegean this percentage is usually made up of 8-9 species.
• Differences in fishermen's practices contribute to the lower discarding in the North Aegean Sea purse seine fishery.

Discussion of the results

A comparison of PS fisheries discards in the North (MINOUW CS 3.2) and the Central Aegean Sea fleets for the period 2003-2008 revealed great differences in discards ratio at the fishery level (independent of species). Even though this difference seems to be reduced in recent years (2014), it is mainly attributed to differences in species composition of the catch in the two areas. In the North Aegean PS fishery, sardine and anchovy dominate the landings summing up to ~90% cumulative contribution, while the Central Aegean PS fishery is more multi-species with several additional species constituting an important part of the landings. The overall higher discards ratio of the Central Aegean PS fishery results because (i) some of the species (e.g., bogue, horse mackerels) are of relatively low commercial value and are characterised by higher discards ratios, and (ii) a substantial number of species are caught in very low quantities (not high enough to be sold). The species composition in the catch is mainly affected by the differences in the relative abundance of the species in the two ecosystems; the North Aegean Sea is a much more productive area due to the extended continental shelf, the Black Sea water input and the river run-offs, and which can support important populations of anchovy and sardine. Therefore, the abundance of these two species is progressively reduced southwards and in parallel, the relative abundance of species like bogue and horse mackerels increases. Finally, we identified some differences in fishers' strategies and practices, which contribute to the lower discarding in the North Aegean Sea PS fishery.

How practical is it for a fisherman to implement this improvement, technically and financially?

The fishing techniques which are already in use are both technically and financially feasible to implement.

Is there sufficient evidence to support wider adoption of the method/technology?

Yes, these fishing practices can be adopted by other fleets around the world depending on the weather/environmental conditions and the composition of the catch.

CONCLUSION

The purse seine fishing technique used by the local fleet is recognised as a best practice. This is proved by the exemplary performance of the Kavala purse seine fleet in terms of the very low discards rates.

More specifically, fishing with PS in Greek waters comprises a “mother vessel”, a rowing boat, and several (up to five) lamp rafts which are released to attract fish once fish aggregations are detected with the use of echo-sounders. When a dense aggregation of fish is formed below the lamp rafts, the “mother vessel” encircles the fish up to the point of the large rowing boat. Then, it winches in the purse line, closing the bottom of the seine and forming a bag-shaped grip that encloses the fish. Finally, the net is brought alongside the “mother vessel”, fish are brought onboard with the use of dip nets and are placed in basins with ice.

In the North Aegean, the lamp rafts are deployed close to each other and an operator from the rowing boat slowly brings them even closer together. This process simultaneously aggregates the fish attracted by each lamp raft and a larger fish aggregation is formed. During this process, the operator is in visual contact with the fish aggregations and can decide whether the fish composition and the sizes of the individual fish are worth catching. At this point, the operator can inform the captain in the event of undersized fish and therefore avoid a catch that would be discarded. Then, the "mother vessel" encircles all lamp rafts together.

The MINOUW Consortium

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