Project brief

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Shrimp peeling in Germany – how a regional value chain can strengthen domestic coastal fisheries

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- **For cost reasons, North Sea shrimp caught in Germany are peeled in Morocco, a logistically complex process, leaving shrimp fishermen dependent on a small number of international wholesalers.**
- **Adding value in the fishing region could change these market structures and provide economic support to struggling fishing companies.**
- **The development of new technologies, alternative marketing channels, better customer information, and diversification of income and financing options offer approaches to achieving this.**

Background and objective

Since brown shrimps (or North Sea shrimp, *Crangon crangon*) are eaten without their shells, they must be peeled by hand, a labor-intensive process. Due to lower labor costs there, international fish wholesalers have set up peeling centers in Morocco. Thus, value creation takes place there and not in the fishing areas along the southern North Sea coast where the shrimp boats operate (Fig. 1). During the COVID-19 pandemic, the dependence of German shrimp fishermen on these wholesale market structures became apparent as if under a magnifying glass: Social distancing and hygiene regulations reduced the capacity of the peeling centers, traders stopped buying catches from the fishermen, who thus suffered revenue losses because there were no alternatives to manual peeling or distribution through wholesalers. In our research and development project "Alternative Value Creation for Shrimps," funded by the state of Lower Saxony, we investigated what options exist to help local fisheries improve their economic performance.

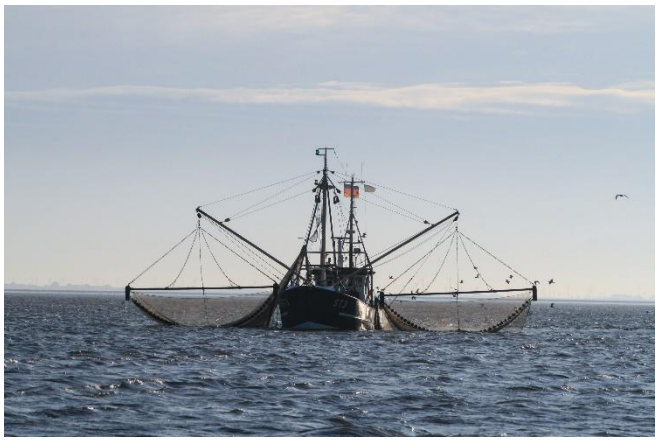

Figure 1: A shrimp vessel in the North Sea (©Thünen Institute/B. Büttner)

Approach

To this end, we at the Thünen Institute of Sea Fisheries, in collaboration with the company US Processing Klever and the Georg August University of Göttingen, analyzed the value chain of the German shrimp fishery and investigated whether and how a new technology for mechanical shrimp de-shellinmg could be implemented and thus enable a regionalization of value creation. The project also examined how efficiently and profitably German shrimp fisheries operate, customer and retailer perspectives on the shrimp product, possible alternative marketing channels, and potential utilization options for any regionally generated shell remains.

Results

Currently, 80-90% of German brown shrimp catches are purchased by just two Dutch wholesalers, who also financially and logistically organize the manual de-shelling in Morocco, reimport the peeled shrimps, and market them to retailers and restaurants. Due to existing market structures and the lack of alternative sales channels, individual fishing companies are dependent on these wholesalers and are in a weak negotiating position vis-à-vis them. Contactless mechanical de-shelling using pressure works in principle (Fig. 2) and promises to be practically feasible; however, scaling up is challenging and was therefore not achieved in the project. Further development work on the prototypes will be necessary, also to ultimately assess the economic viability of de-shelling machines based on the new technology and thus their potential contribution to regional value creation. Existing mechanical machines cannot achieve this due to technical deficiencies and the resulting high

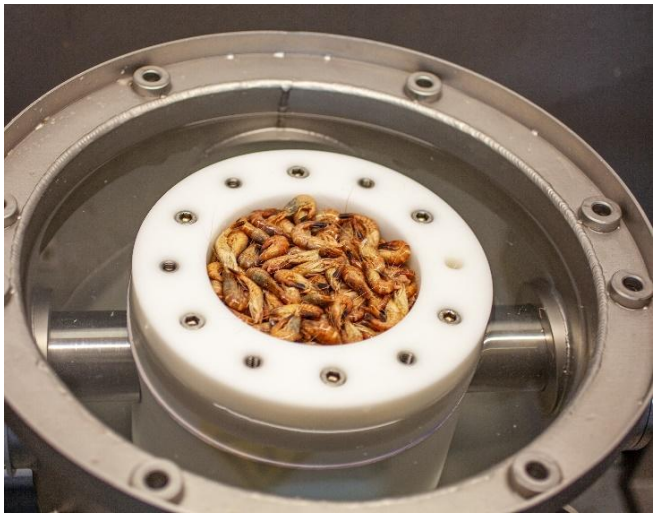

Figure 2: Brown shrimps in the opened, second and not yet modified test de-shelling unit of the machine, ready for de-shelling (©Thünen Institute/ H. Brückner).

labor costs and low meat yield, and are, at least regionally, only profitable in very limited niche markets.
However, due to the inability of fishing companies, especially those using larger vessels, to build up monetary reserves in recent years, their investment opportunities in establishing their own de-shelling capacities are very limited, as is their willingness to do so given the prevailing uncertainties (including the applicability of the new technology or the potential reactions of wholesalers to such attempts).
Cooperative operating models, e.g., run by producer organizations, for regional de-shelling centers could be a solution. Even relatively small amounts of regional de-shelling, also to avoid competing with wholesalers, could increase the profitability of brown shrimp fishing companies if the contactless technology is economically viable.
Furthermore, there is clear evidence that improvements in the efficiency of individual fishing operations, although already relatively high, are possible. For example, companies that do not fish in winter or use vessels with modern hull materials operate more efficiently. Greater technical efficiency goes hand in hand with higher profits. Marketing of products made from regionally generated shrimp shell remains in the hobby sector (gardening, pet food, fishing) is also possible and, with.appropriate investment, could generate additional revenue (Fig. 3).
For consumers, brown shrimps are a typical North Sea product and are often familiar from vacations; regionality, including shrimp peeling, is important to them and is reflected in a higher willingness to pay. However, mechanical peeling is often viewed with skepticism, and shrimps that are mechanically peeled using existing machines, i.e. North Sea shrimp, which are peeled by contact, performed poorly in terms of appearance and consistency compared to North Sea shrimp peeled by hand in Morocco. More, many consumers still have a high need for information about North Sea shrimp and its processing methods.

Figure 3: The three products ("streams") from mechanical de-shelling. From bottom to top: shrimp meat (freed from its shell, here still with the shell fragments - darker in color - detached but not yet shed at the tail end), shell remains. and process water (©Thünen Institute/H. Brückner)

Conclusions

In conclusion, it was shown in detail how a regional value chain could be an important building block in helping to improve the economic situation of shrimp fishing, although upscaling and economic viability testing of the new contactless technology are still pending.

Further information

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Publications

Niemann M, Lasner T (2024) Das Wunder von Großheide? Ein Zwischenstand zur maschinellen Entschälung der Nordseekrabbe. In: Fischerblatt (03/2024), S. 9–12.

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