

## Extended Abstract

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<b>Paper/Poster Title</b>	<b>Risk sources and risk management in a coastal fishery</b>
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Abstract prepared for presentation at the 96<sup>th</sup> Annual Conference of the Agricultural Economics Society, K U Leuven, Belgium

4<sup>th</sup> – 6<sup>th</sup> April 2022

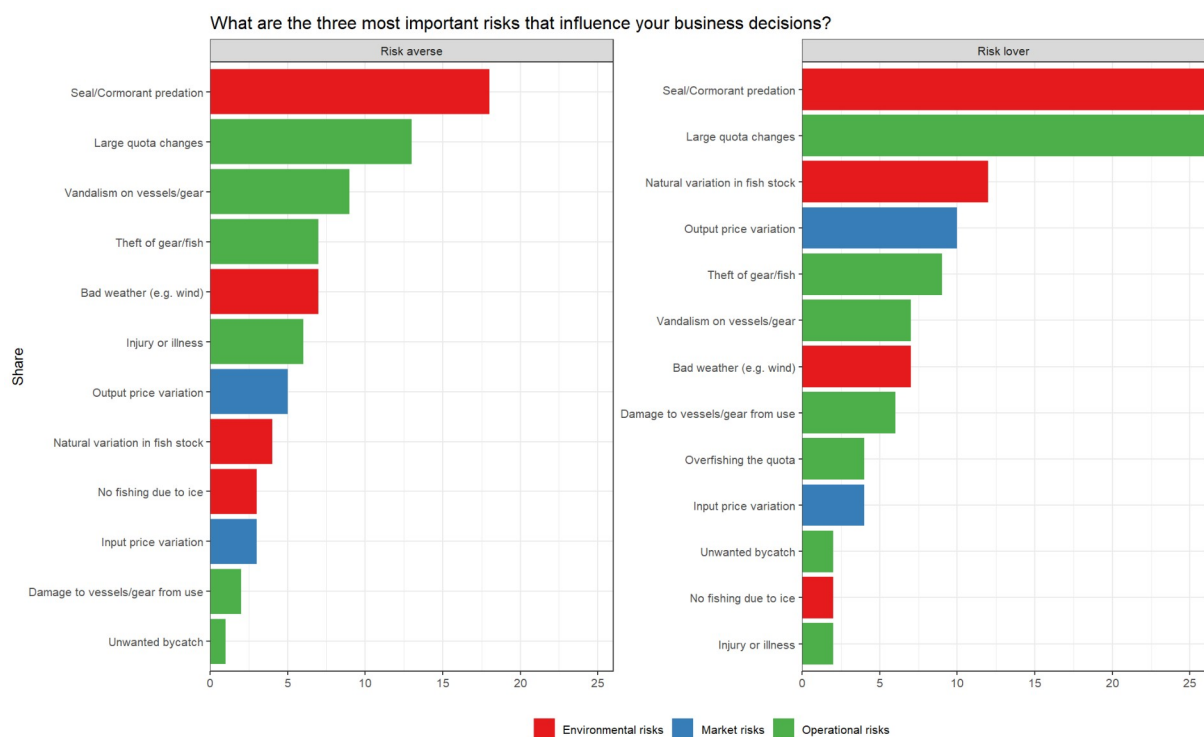
<b>Abstract</b>	<b>200 words max</b>
In this paper, we study the risk priorities and risk management strategies of German coastal fishers. We find that fishers are particularly vulnerable to seal and cormorant predation, as well as theft and vandalism of fish and fishing gear. Fishers often use direct marketing and buyer diversification to reduce output price risks. Priorities on injury or illness were higher for risk averse than for risk loving fishers.	
<b>Keywords</b>	Coastal fisheries, risk management
<b>JEL Code</b>	Q220
<b>Introduction</b>	<b>100 – 250 words</b>
<p>Risk is a an important component of coastal fishing operations. Risk can be defined as the change of adverse effects from deviations from expectations. Fishers can typically pursue three different strategies regarding risks (Sethi et al. 2010): avoid risks, transfer risks, or retain risks. When retaining risks, fishers can decide to reduce the likelihood of an event happening, or reduce the severity of its impact, or do nothing. An example of risk transfer is insurance, where the individual risk of expected losses is transferred to someone who is better at bearing it. Finally, fishers can reduce their exposure to risk by simply avoiding risky activities.</p> <p>In this study, we use data from a sample of German coastal fishers in Mecklenburg-Vorpommern (MV) to better understand how fishers deal with different types of risk, in particular environmental risks (e.g. variation in fish stocks, weather, or cormorant predation), market risks (variation in input and output prices), and other operational risks (e.g. injury, vandalism or theft, collisions, etc.). The MV fishery underwent dramatic changes since the German reunification, as fishers numbers have dropped substantially. In the past five years, fishers were confronted with large quota cuts of the main target species cod and herring. In addition, populations of cormorants and seals as well as recreational use of fish stocks and waterbodies have increased.</p>	
<b>Methodology</b>	<b>100 – 250 words</b>
We distributed a questionnaire among all registered fishers along the MV coast, where fishers were led through a task assessing for 14 different risks whether they had (1) experienced the risk before, (2) whether they rated this risk as unimportant or important for their business decisions, and finally (3) which measures they took to reduce risk exposure. Then, fishers were asked to name the three most important	

risks out of the list of 14, as well as some general questions on risk preferences. Eighty-nine fishers sent back the questionnaire, making a (to date) response rate of 28%.

**Results**

**100 – 250 words**

We classified fishers based on the question "How willing are you to take risks while fishing" (0-10 scale) using a median split into "risk averse" and "risk lovers". The overall ranking of risks was similar between the two groups, although risk averse fishers ranked the risks of vandalism, bad weather and injury or illness higher than their counterparts. Two types of risk were mentioned particularly often as being the most important by both groups: large quota changes (37 mentions) and predation by cormorants or seals (47 mentions). 24 fishers claimed that they would change their fishing area to avoid predation, though 19 fishers suggested that they would not have the possibility to do so.



With large quota changes, most fishers (40) mentioned that they would keep the possibility to target different species, e.g. by keeping different gears operational (24) or by keeping licenses for different fishing areas. With the next two items, the ranking diverged between the two fisher types. Risk averse fishers particularly often mentioned vandalism and theft of gear/fish, risk lovers were more concerned about natural variation in fish stock and the output price risks. Fishers can avoid vandalism by avoiding certain fishing areas (23) or transfer the risk by having insurance (13). Several fishers mentioned that they were powerless against theft of gear and fish, and mentioned ex-post strategies such as reporting the theft to the police. Output price variation was mentioned 15 times. The majority of fishers in the sample used direct sales (59) or sold to multiple buyers (40). Eighteen fishers were able to store



the fish to sell it later whereas only five had contracts with buyers and one used certification for his products. No fishers mentioned hedging as a strategy to avoid price risks. On input markets, 31 fishers mentioned that they would store inputs to avoid price risks, and 11 had contracts with sellers. Injury or illness were ranked 6<sup>th</sup> with the risk averse fishers, but last with the risk lovers; most fishers had health insurance (50) or occupational disability insurance (32), while only few had contingency insurance (6).

**Discussion and Conclusion**

**100 – 250 words**

Risk is prevalent in coastal fishing, and our findings indicate a clear ranking of priorities that policy makers could address. Clearly, with the advance of cormorants and seals in the area, predation and the destruction of fishing gear has become an issue. This issue points to the larger conflict between nature conservation interest and traditional coastal fisheries. As commercial fishers in the area also have different licenses for fishing areas, and these licenses are typically not easy to come by, only some fishers can easily fish in areas that are less impacted by these predators. A second issue policy makers may address is the theft and vandalism of gear and fish. As almost all fishers experienced this in the past and several mentioned their powerlessness, improved monitoring and enforcement could help fishers remain productive. Finally, as most fishers are able to reduce output price risks through direct marketing and a diversified portfolio of buyers, options to store fish, contracts with buyers, as well as hedging could be explored or expanded. Fishers generally tend to either avoid risks (e.g. predation) or retain risks while reducing the severity (e.g. diversify). Risk transfer via insurance is mostly done via the standard social insurance, and to a lesser extent via occupational disability insurance, but fishers are rarely covered through contingency insurance for incurred losses due to illness.