

Abstract

This dissertation develops an integrated analysis of socio-economic resilience, fisheries governance, and environmental transformation within the South Baltic Sea fisheries sector. Drawing upon an interdisciplinary environmental, social, and economic systems, the study examines how environmental decline, fisheries governance reforms, and structural economic change interact to shape the adaptive capacity and long-term viability of fishing communities. Particular attention is devoted to the different experiences of small-scale fisheries compared with large-scale fishermen, who face increasing pressures resulting from declining fish stocks, quota reductions, changing ecosystem conditions, and restructuring processes within fisheries governance under the European Union's Common Fisheries Policy.

The dissertation is structured as an article-based thesis consisting of a cycle of thematically related scientific publications that collectively analyse the ecological, economic, governance, and socio-cultural dimensions of fisheries resilience. The primary aim of the dissertation is to examine how environmental change, fisheries governance, and structural economic pressures influence the socio-economic resilience and adaptive capacity of fishing communities in the South Baltic Sea.

The research combines environmental and fisheries stock analysis with empirical socio-economic research conducted among fishermen operating within International Council for the Exploration of the Sea (ICES) Subdivisions 24–26, which represent defined fisheries management areas in the South Baltic Sea covering Polish and German waters. The study analyses environmental drivers affecting commercial fish stocks, relationships between total allowable catches (TAC) and spawning stock biomass, the socio-economic consequences of the 2019 Baltic cod (*Gadus morhua*) fishing ban, adaptive livelihood strategies among different fleet segments, and the role of local ecological knowledge (LEK) within fisheries assessment and governance systems.

The methodological framework combines both quantitative and qualitative approaches. The first component employs systematic literature review methods and fisheries assessment analysis based on ICES stock assessment data, TAC allocations, fisheries landings statistics, and environmental indicators. The second component is based on mixed-methods empirical research conducted among fishing communities through questionnaire surveys and semi-structured interviews. These approaches were used to examine fishermen's perceptions of environmental transformation, governance challenges, economic pressures, and adaptive responses within the fisheries sector. A comparative Polish–German analysis was additionally conducted to investigate the relationship between fishermen's LEK and scientific indicators of fish stock abundance.

The findings demonstrate that resilience within Baltic Sea fisheries is highly uneven and structurally differentiated across fleet segments and regions. Environmental degradation, particularly the collapse of Baltic cod stocks, has accelerated economic restructuring within the fisheries sector, disproportionately affecting small-scale and demersal fisheries that possess lower levels of mobility, diversification potential, and quota flexibility. In contrast, larger fishing operations targeting more stable resources demonstrated greater adaptive capacity due to increased operational flexibility and access to fishing opportunities.

The research further demonstrates that governance systems based primarily on stock-level biological indicators often fail to fully capture the socio-economic diversity and spatial heterogeneity of fisheries systems. Differences in vessel size, fishing activity, quota access, and regional conditions strongly influence how fishermen experience and respond to ecological and regulatory change.

The integration of LEK with ICES assessments and fisheries-independent indicators demonstrates that fishermen possess spatially resolved experiential knowledge that can complement existing scientific assessment frameworks and improve understanding of localized stock dynamics. Incorporating stakeholder knowledge may therefore strengthen the development of more adaptive and socially responsive fisheries governance systems.

The study contributes to fisheries resilience literature by integrating environmental, governance, and socio-economic perspectives within a unified analytical framework. It advances understanding of how ecological change, fisheries governance reforms, and economic pressures interact to produce uneven resilience outcomes within heterogeneous fisheries systems.

The findings hold practical implications for fisheries governance and sustainable sector development. The dissertation argues that future fisheries management strategies should move beyond purely biological stock-based approaches and incorporate socio-economic differentiation, regional variability, and fishermen's experiential knowledge into governance processes. More adaptive and spatially responsive management systems may strengthen both ecological sustainability and the long-term economic resilience of fisheries-dependent coastal communities in the Baltic Sea region.

Keywords: *Baltic Sea fisheries; fisheries governance; fisheries management; local ecological knowledge; small-scale fisheries; social–ecological systems; socio-economic resilience; sustainable fisheries*