



Structural Adjustment and Regulation of Nordic Fisheries until 2025

A focus on Market Based Fisheries Management



Max Nielsen
Associate Professor
Department of Food and
Resource Economics
University of Copenhagen

This presentation

1. Background
2. Regulation framework
3. Nordic experiences
4. Nordic policy lessons
5. Forecasts until 2025



1. Background

"Structural Adjustment and Regulation of Nordic Fisheries until 2025"

- ❑ Made upon request from the Fisheries Cooperation, the Nordic Council of Ministers.
- ❑ Part of the background work for this Conference *"Fisheries and society – challenges to 2025"*
- ❑ Coordinator: Max Nielsen, University of Copenhagen,
- ❑ Modelling: Ayoe Hoff, University of Copenhagen
- ❑ Participants
 - Greenland – Max Nielsen, Ayoe Hoff and Rasmus Nielsen
 - Iceland - Daði Már Kristófersson (UI) and Hordur Sævaldsson (UA)
 - Denmark – Ayoe Hoff, Max Nielsen, Rasmus Nielsen, Peder Andersen (UC)
 - Finland - Jarno Virtanen and Jari Setälä (NRI)
 - Sweden - *Staffan Waldo and Cecilia Hammarlund (SUAS/LU)*
 - Norway – Kristin Roll (USEN) and Frank Asche (UF)
 - Faroe Islands - *Heri á Rógvi and Hans Ellefsen (MF)*



1. Background

- ❑ Before 1970
 - Fish in the sea considered non-exhaustible
 - Effective fishing methods improve
 - Cod war Iceland-UK led to 50 nautical mile EEZ
- ❑ After 1970
 - Herring stocks in the Northeast Atlantic Ocean collapsed
 - 200 nautical mile EEZ gave property rights to nations
 - Grand Bank cod fishery, the world largest, collapsed
 - Fish in the sea now considered scarce - biological management developed and economic considerations more important
- ❑ After 1980 – Overfishing, overcapacity, deficits, decom. subsidies
- ❑ Today - Market Based Fisheries Management in force
 - Overfishing to a large extent solved/institutionalized with MSY
 - Overcapacity removed – profits earned – subsidies removed
 - We create values, how do we allocate those?



1. Background

Current Nordic debates

- ❑ Greenland – New Fishery Law heavily debated
- ❑ Denmark – State Auditors report induced debate on quota kings, fishery authorities moved to Ministry of Foreign Affairs
- ❑ Norway – One Parliament Committee recommended full ITQs, another rationalization of regulation founded on active fishermen
- ❑ Sweden – evaluations shown pelagic ITQs has changed fleet structure, the system not introduced to other fisheries
- ❑ Faroe Islands – 2018 fishery policy revision debated for years

Our purpose

1. To analyze what we can learn from Market Based Management of Nordic fisheries.
2. To forecast what the fishery sector looks like in 2025 with unchanged fishery policy. And with changed.



2. Regulation framework



Optimal

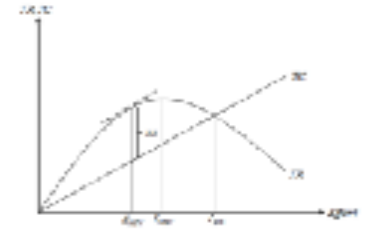
- MSY in fisheries?
- Cost minimization?

The heritage:



Reform was necessary

2. Regulation framework

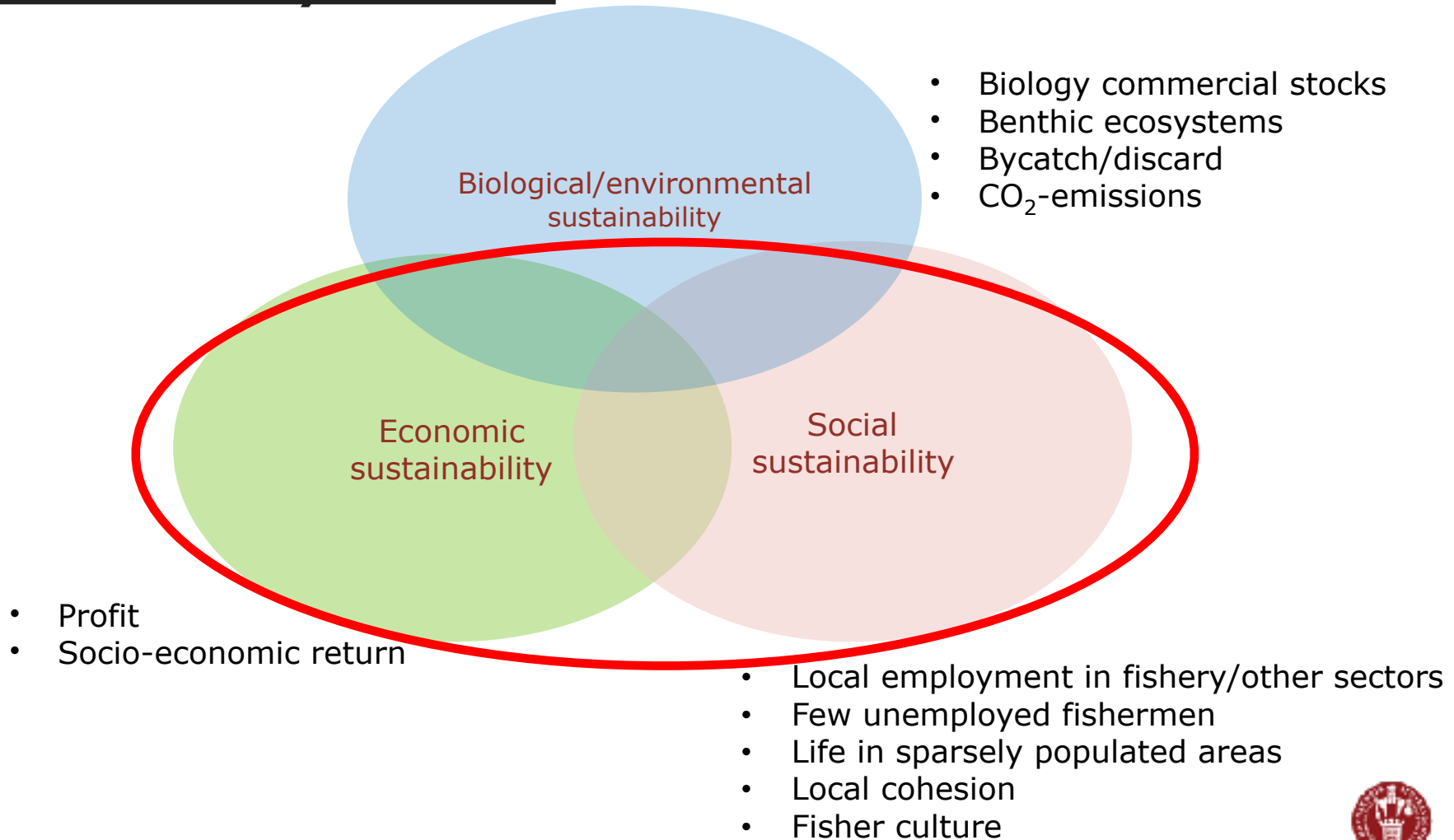


- Purpose of regulation “to avoid that there are too many fishermen to fish too few fish”.
 - Biology handled through MSY purpose/stock management
 - Market Based Fisheries Management (MBFM) based on tradable property rights, such as
 - Individual Transferable Quotas/ITQs
 - Individual transferable days at sea
 - Political choice to balance
 - Profit
 - Socio-economic return = “*The net-surplus that remains for remuneration of capital/labor above what is achieved in other businesses including extraordinary taxes paid*”
 - Employment in sparsely populated coastal communities
 - Funding of public expenses through taxes.



2. Regulation framework

Effects of fishery reforms:



Our focus: Economic sustainability and employment



3. Nordic experiences

Case studies

- ❑ Selected among different types of Market Based Managed fisheries

- ❑ Greenland – ITQ regulated shrimp fishery, 1991/2000
- ❑ Iceland – ITQ regulated Stern trawler/pelagic fisheries, mid-1980s
- ❑ Denmark – ITQ regulated demersal North Sea fishery, 2007
- ❑ Finland – ITQ regulated pelagic fishery, 2017
- ❑ Sweden – ITQ regulated pelagic fishery, 2009
- ❑ Norway – IQ regulated demersal fishery north of 62°transferable within vessel groups, claim vessel removal, 20 % reallocated
- ❑ Faroe Islands – demersal fishery transferable days at sea regulated until 2018, afterwards IQs.



3. Nordic experiences

□ Economy (annual avg 2012-2014)

Annual avg 2012-14	GR SHR	ICE DEM/PEL	DEN DEM NS	FIN PEL	SWE PEL	NOR N 62°	FAR DEM
FT employment	291	2394	359	110	167	5489	415
Vessels	30	79	147	63	30	1192	45
Species (%)	PRA	MAC	PLE	HER	HER	COD	SAI
	.	CAP	COD	SPR	SPR	HAD	COD
Turnover/vessel (€1000)	6233	7633	701	460	1733	750	1778
Fish tax revenue (€ Mio)	14	35
Socio-eco return							
- € Million	82	255	19	0	12	233	-9
- % turnover	44	42	18	-1	23	26	-11
Profit							
- € Million	39	98	7	2	12	152	-7
- % turnover	21	16	7	7	23	17	-9

- Socio-eco return %-largest in GR/ICE, medio in NOR/SWE/DEN
- Largest vessels/longest lasting ITQs in GR/ICE, stock rising in GR/SW
- Profit largest in SWE/GRE, medio in NOR/ICE



4. Nordic policy lessons

1. ITQs is a powerful instrument to increase earnings and remove overcapacity, that also reduce fleet size and employment in fisheries.

Documentation

- ❑ Development due to ITQs – and technology development, productivity increase and price changes.
- ❑ Socio-economic return often *all other things equal* increase over time, profit with adjustment, both with technology improvement.
- ❑ Greenland – shrimp fleet reduced 2/3 2002-2017, 82 % from 1993.
- ❑ Iceland – Stern trawlers 138-45 1990-2015 pelagic 107-25 1970-2015
- ❑ Sweden – pelagic fleet reduced 55 % 2009-2013, socio-economic return rise €1.6-12 Million 2001/03-2012/14
- ❑ Denmark – active fleet 1321-506 vessels 2002-2014, employment fall 2/3, socio-economic return rise DKK -181/963 mio 2000-2013.



4. Nordic policy lessons

2. All prevailing Nordic Market Based Fisheries Management systems have special arrangements for some vessel groups.

Documentation

- ❑ Greenland – quota sale ban from shrimp trawlers <120 GT to offshore trawlers
- ❑ Iceland – quota trade closed between coastal vessels <15 m and larger vessels, regional Olympic coastal fishery with jigging reel
- ❑ Denmark – two voluntary coastal arrangement for vessels <15/17, give extra quotas, ban of quota sale to larger vessels
- ❑ Sweden – coastal herring fishery in West Baltic not in ITQ system
- ❑ Norway – quota trade not allowed across vessels groups, cross-regional trade also limited.



4. Nordic policy lessons

3. The Market Based Management systems in the Nordic fisheries all have variation of concentration rule in force.

Documentation

- ❑ Greenland – offshore/coastal shrimp companies cannot own >33%/15% of quotas in each group
- ❑ Iceland – 20% limit on quota ownership for pelagic species.
- ❑ Denmark – one person cannot own >10%/4% of all pelagic/demersal quotas, cross rules, for demersal a % is defined for all stocks. Administration of rules recently tightened.
- ❑ Norway – limitations on how many structural quotas a single vessel can own.



4. Nordic policy lessons

4. It is not a universal rule that Market Based Fisheries Management always removes the small vessels.

Documentation

- ❑ Increasing returns to scale vs. tendency for large pelagic/small demersal vessels
- ❑ Sweden – pelagic vessels >24 m fall more than vessels <24 m 2009-2013
- ❑ Denmark – active fleet on <12 m/12-14 m/>24 m falls 2002-2014 52-68-65%, total GT reduced most for small vessels, average GT rise for all groups
- ❑ Greenland – offshore/coastal shrimp fleet falls 68/63% 2002-2017
- ❑ Explained by the special arrangement in ITQ systems.



4. Nordic policy lessons

5. Fishing taxes may play a core role for wealth creation in the fishery dependent Nordic countries.

Documentation

- Fishing taxes on top of income/corporation taxes
- Fishing taxes for reallocation, not for fishery regulation – quota auctions equivalent
- Iceland – around 6 % of the landing value, set by a formula taking into account e.g. price and fuel costs developments.
- Greenland – 9 % of shrimp landing value, tax rate increase with doubled prices 2010-2015. Substantial in Government income
- Faroe Islands – quota auctions have been used for mackerel.



4. Nordic policy lessons

6. Expensive quotas makes it difficult to abolish or drastically change an ITQ system.


Documentation

- ❑ ITQs - expected future earnings capitalize in quota values
 - Many current quota owners have paid for quotas
 - Future earning removed from fishery
 - If rights are taken from active owners, they may go bankrupt
- ❑ Denmark – a long public debate in 2017-2018 on quota concentration, severe criticism of regulation, changes in administration of concentration
- ❑ Greenland – debate on New Fishery Law, rights suggested limited to 5 years, quotas reallocated to small vessels
- ❑ But: ITQs still prevails despite the heated debates.



5. Forecasts until 2025

Where are we in 2025 with unchanged fishery policy? With changed?

- ❑ We forecast: socio-economic return/profit, fleet size, employment
- ❑ Model – the dynamic bio-economic Fishrent model maximize net present value of future earnings
- ❑ Assumptions
 - Fishermen act in own long-run interest and maximize profit
 - Quota prices is the average of buyers WTP and sellers WTA
 - Recruitment increases with fish stocks to MSY and fall after. Stocks must be within the maximum observed 1995-2014.
 - MSY quota setting policy  All other thing equal
- ❑ Scenarios
 1. Current management, 4 % annual fleet adjustment limit
 2. Free quota trade, 4 % limit
 3. Current management, no limit
 4. Scenario 1 and a 10 % tax on turnover.



5. Forecasts until 2025

□ Predicted socio-economic return

€ Million (% of landing value)	GR SHR	ICE DEM/PEL	DEN DEM NS	FIN BIG PEL	SW BIG PEL	NOR DEM>62°	FAR DEM
2015 (€Million)	69	225	22	-2	11	234	-10
2015 (%)	45%	26%	22%	-7%	21%	27%	-14%
2025 scenarios:							
1. Cur management (%)	60%	49%	31%	10%	35%	36%	25%
2. ITQs free trade (%)	52%	51%	32%	.	.	37%	30%
3. Cur man full adj (%)	61%	54%	39%	38%	40%	49%	43%

- Fleet/employment reductions in all cases
- ICE/NOR – “choke” problem underestimate socio-economic return
- GR/SW – catches/earnings rise due to improved fish stocks
- A 10 % landing tax can be introduced without profit reductions in 2025 in GR/DEN/FIN/SW/FAR.



5. Forecasts until 2025

Conclusion on forecasts

- ❑ Continued Market Based Fisheries Management is forecasted to increase socio-economic return/profits towards 2025 and reduce fleets and employment
- ❑ Structural adjustment continues – with/without technology improvement
- ❑ Free quota trade induces extra earning and reduced employment in 2025 compared to unchanged regulation
- ❑ An extra fishing tax on 10 % of the landing value can in more cases be collected without reduced profits in 2025.



Further gains projected – how do we use them?

