

Danish Farming of Sea Trout



The Ugly Duckling of Danish Food Production

Karl Iver Dahl-Madsen

About Denmark

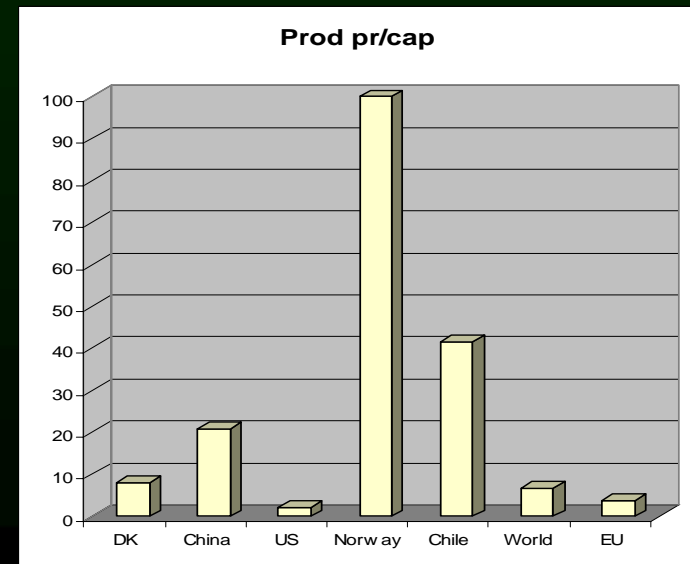
- ❑ No novice in food production
- ❑ Major pig farming cluster
- ❑ 1 Danish Farmer produces food for 150 people
- ❑ We are European leaders in fresh water trout production since late 1800
- ❑ We invented eel farming in recirculated systems in 1980
- ❑ And surely wanted to take part in sea farming of trout



Agriculture: Norsminde “Køkkenmødding”



◆ 4000 before BC: From hunter/gatherer to farmer



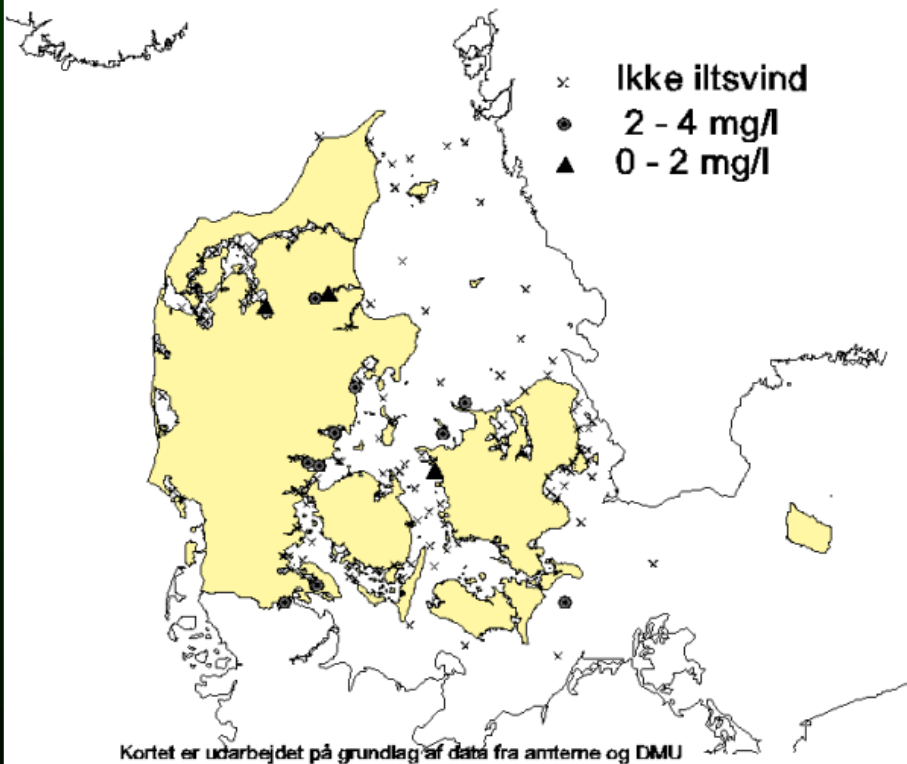
Great Expectations

- In the late seventies:
- Many Sea Farms established
- Lot's of optimism
- Booming business
- The Start of a Trout Cluster?



Dead Lobsters

Iltsvind september 1997



- Also in the late Seventies:
- Increasing fertiliser output from agriculture
- Oxygen deficit in coastal waters
- Lobsters dying
- Big outcry, clean water act:
- STOP Seafarming

1 Billion Nkr. Month

- Danish Sea Farming fell asleep:
 - 8000 t fish/yr=300 mio.DKR
- Norwegian fish farming boomed
 - 500.000 t fish/yr=1 bio. NKr/Month!

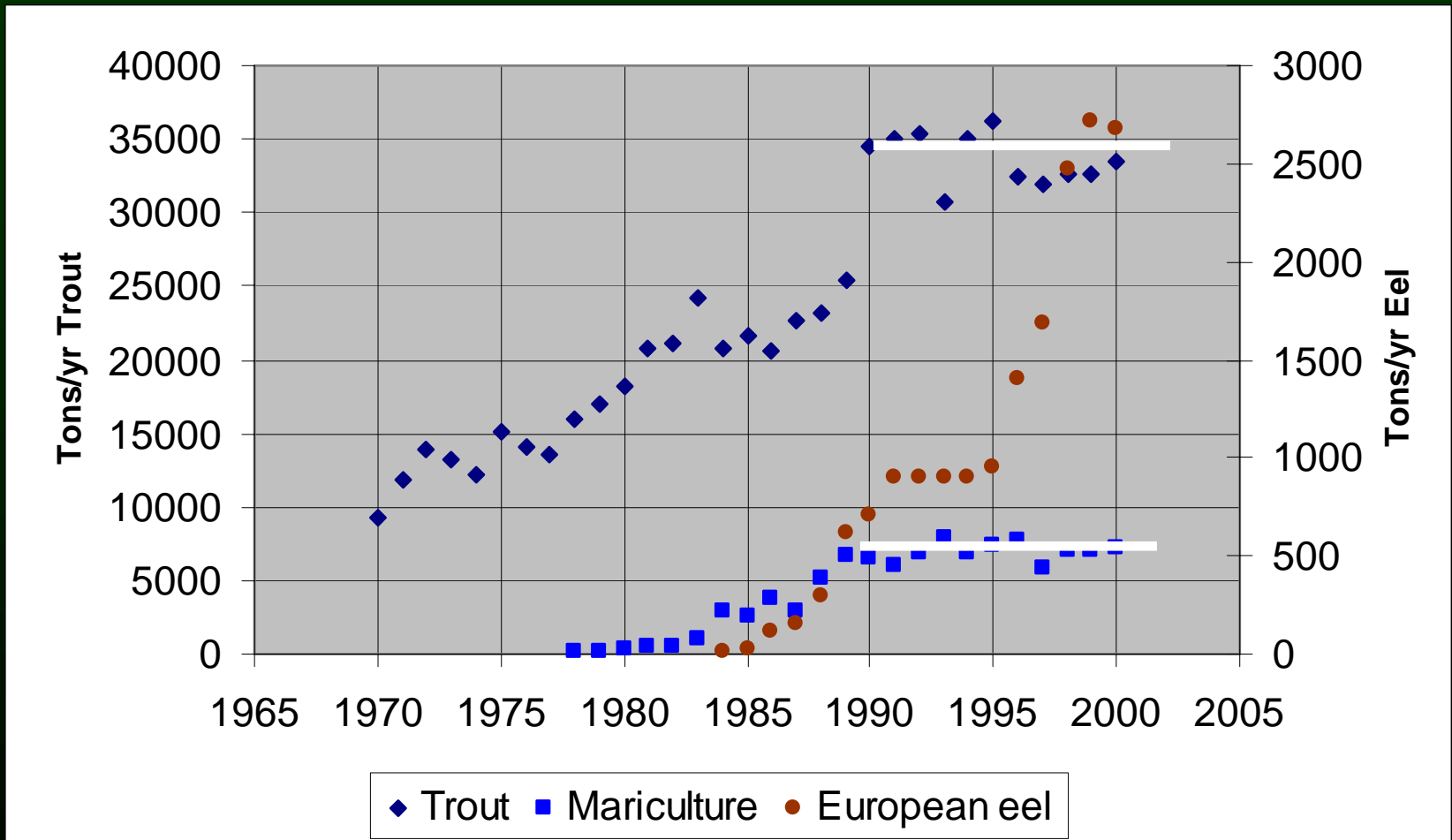


The Revenge of the Civil Servants



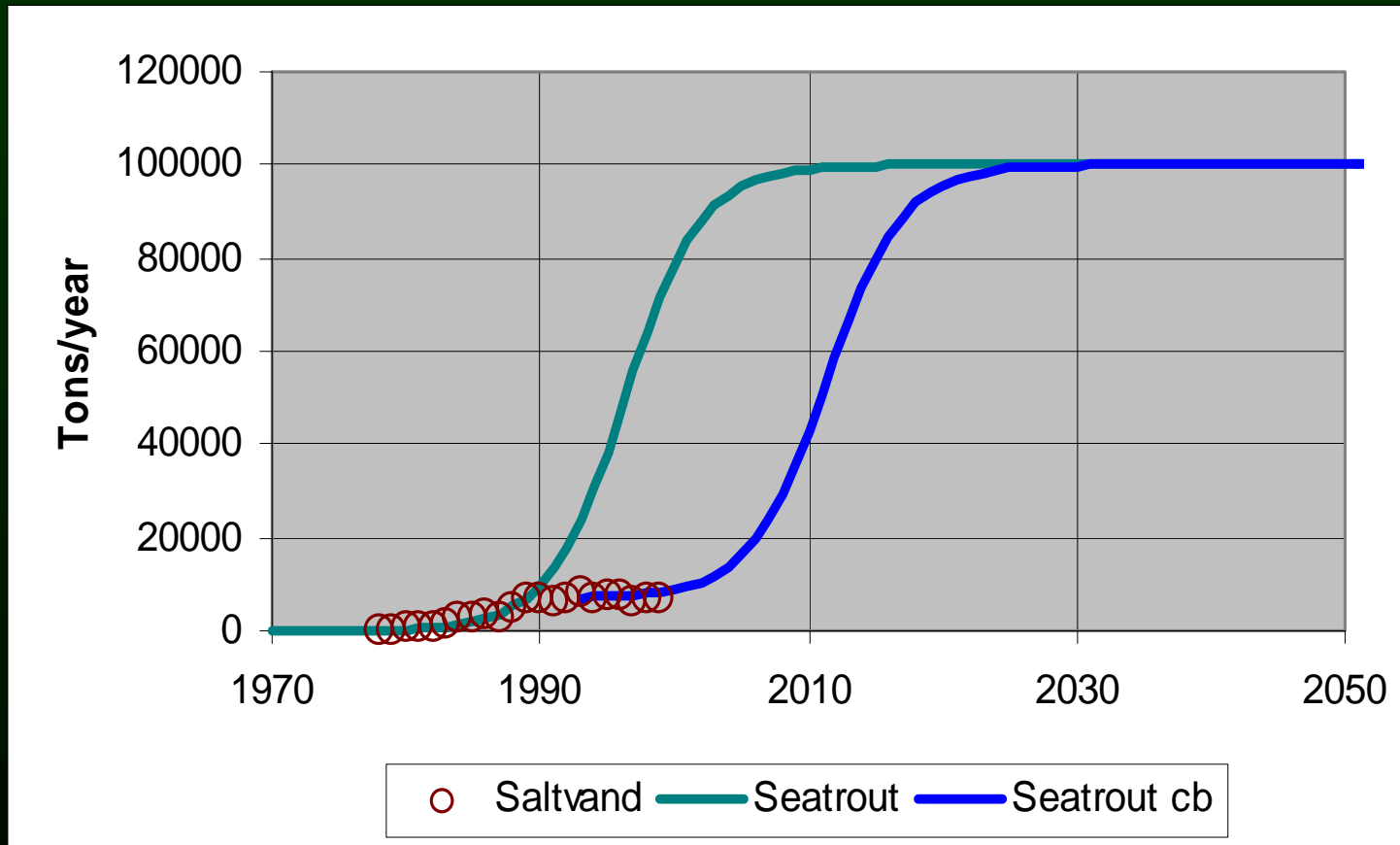
- Denmark is not Corrupt!
- However, civil servants may have their own agendas
- All kinds of disproportionate information were put forward
- Also from NGO's
- And the Industry kept quiet

Aquaculture in Denmark Stagnated



Stagnation! Caused by (Valid) Environmental Concerns

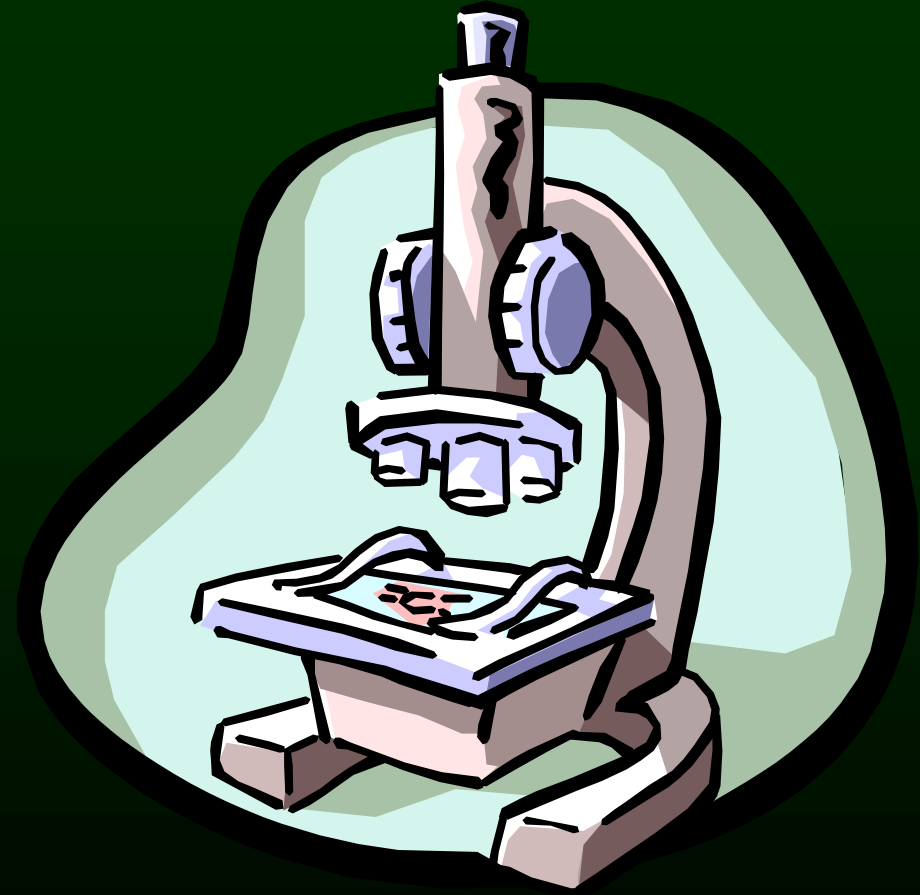
What Did We Miss?



Exports to the Value of 1/2 of a Great Belt Bridge!

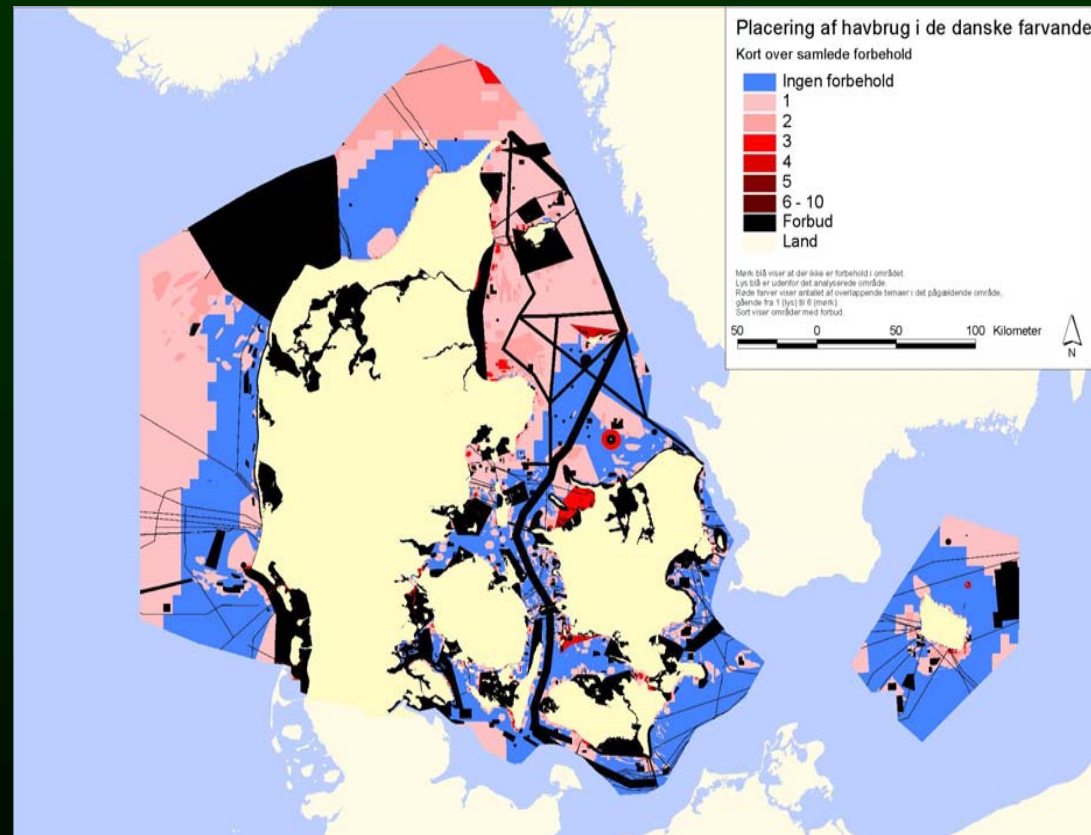
Science is Conquering

- The Sea farm
Industry fought back
- With good solid
science
- And the winds
started to change



The Aquaculture Committees, Spring 2003

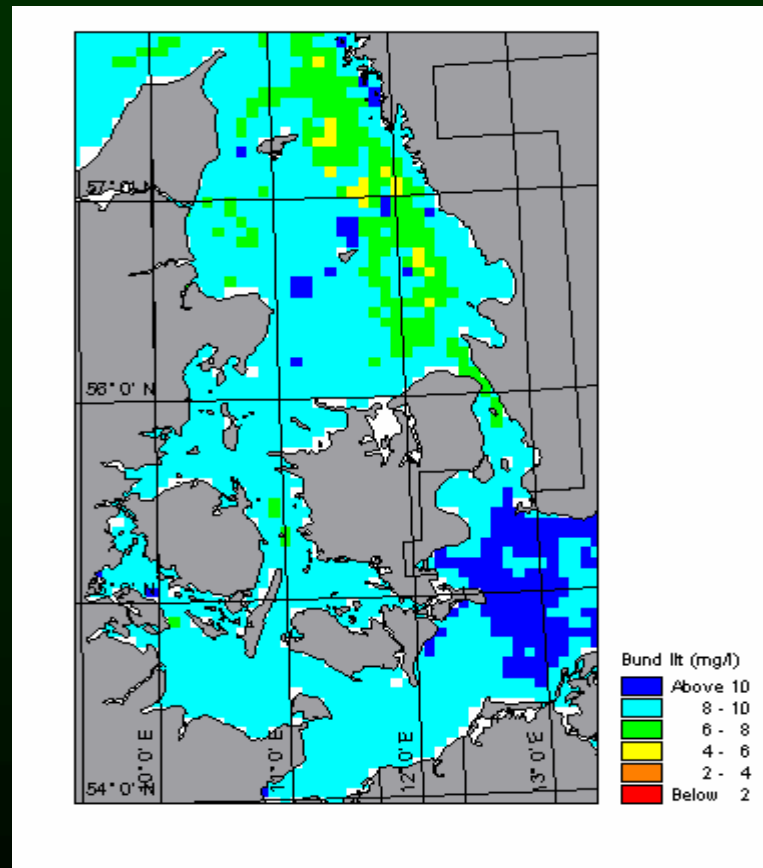
- Initiative from a multipartisan parliamentary Network
- Recommends growth in Danish Sea Farming
- With due respect for environmental concerns
- The national and local politicians are discussing what to do



25.000 km² fit for sea farming

The Dilemma

- Promoting Growth, Production, Exports and Employment
- Vs. Increased Environmental Stress
- Not an easy choice in these years of oxygen problems in Danish Waters



Oxygen in Danish Waters Today at 12:00

What Do the Sea Farmers Want?

- Room to produce what the market demands
- Up to 100.000 tons trout produced
- Decoupling of production and environmental impact
- The limit is market and space:
100.000 tons ? 200.000 tons?



Musholm Lax: 3.000 t/yr

What Do the NGO's Want?

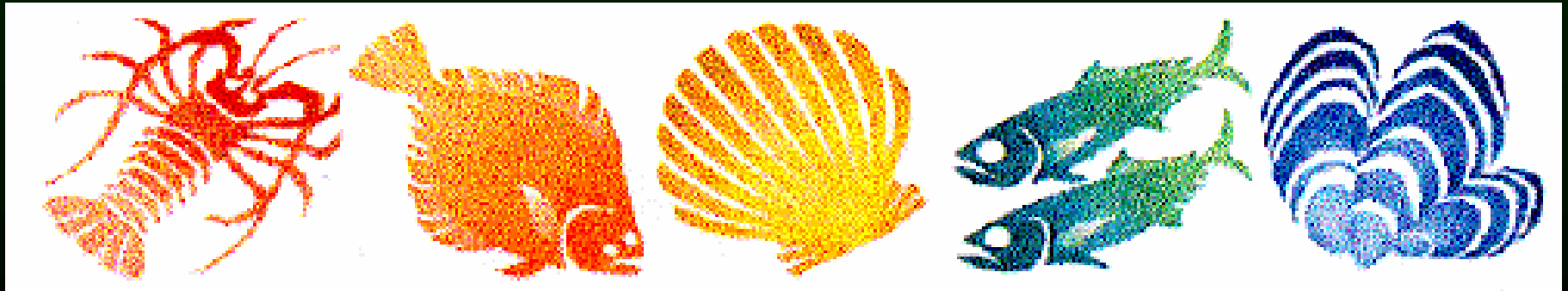


- Even a small increase in load is too much
- NIMBY (NIMCO): All seafarms to Norway or Chile?
- Landbased farms
- Denmark to live off IT, biotech & entertainment?

The Solution Is Increased Environmental Efficiency

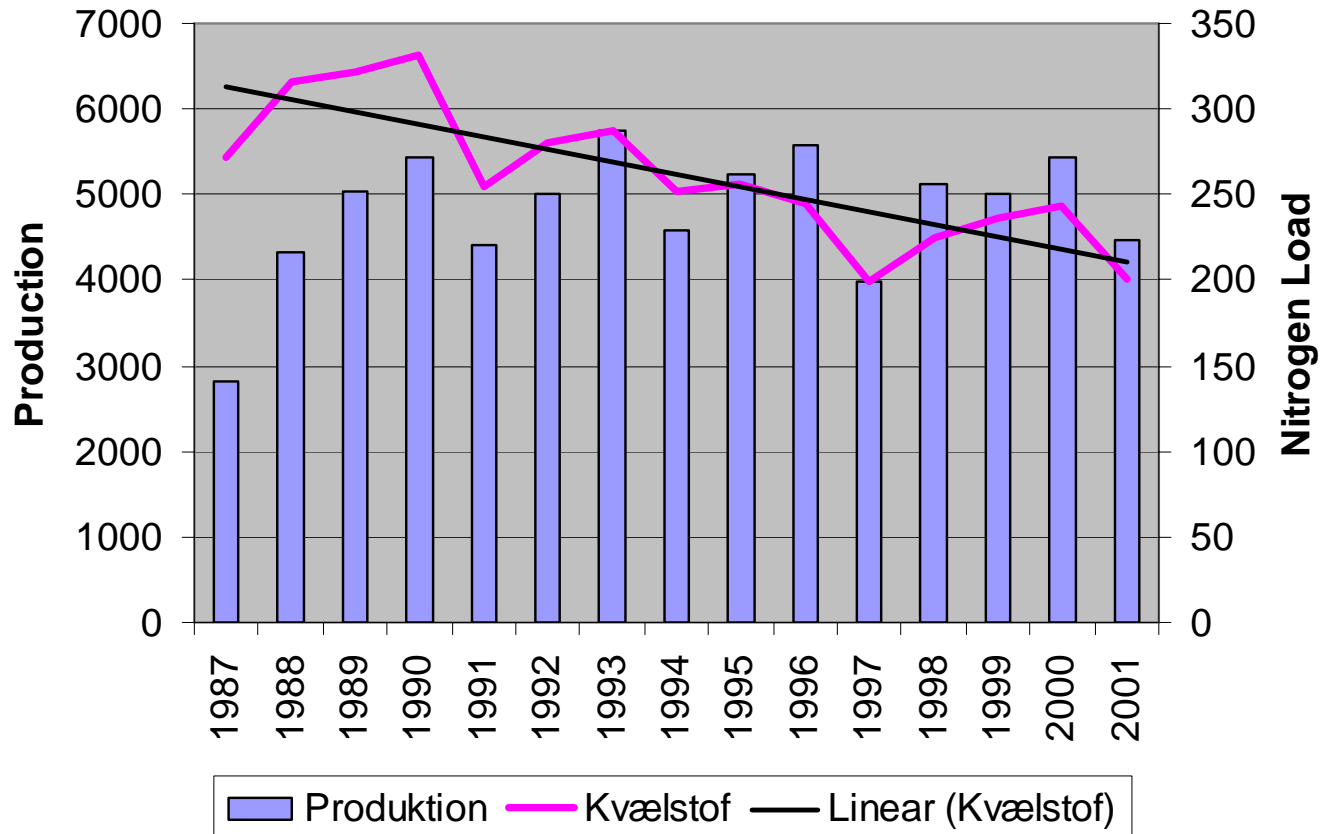
		<i>Agriculture</i>	<i>Freshwater</i>	<i>Mariculture</i>
		2000, after H. Schröder		
Sales	tDkr	50.000.000	700.000	250.000
N-loss to nature	Tons	380.000	500	300
N-Efficiency	Mio. Dkr/ton:	0,12	1,4	1,1

Agriculture can increase production? Why not Aquaculture?



Sea Farm N-Efficiency

Mariculture & Environment



Mariculture & Environment in Denmark



- Area Demand: $2 \text{ km}^2 = 0.02 \text{ ppt}$ of the Danish territorial waters
- Organic load impact below and close to the cages
- 250 tons N/yr: app. 2 ppt of the net flux of N through the Danish waters