Innovation mechanisms in the Norwegian Fisheries and Aquaculture industry

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Content

- The industry today
- Definition of innovation
- Mechanisms in the innovation system

- Based on:
  - A multiplier Effect study (SINTEF)
  - A study of the Innovation System in Norwegian Aquaculture (STEP and KPMG)

The industry today

- Based on the Economical Impact of the Fisheries and Aquaculture Industry in Norway – a Multiplier Effect Study
- Starting point for the work shop
- A “industry thermometer”
- Employment, value added and productivity
- Is the multiplier effect studies a good tool for measuring innovation in an industry?

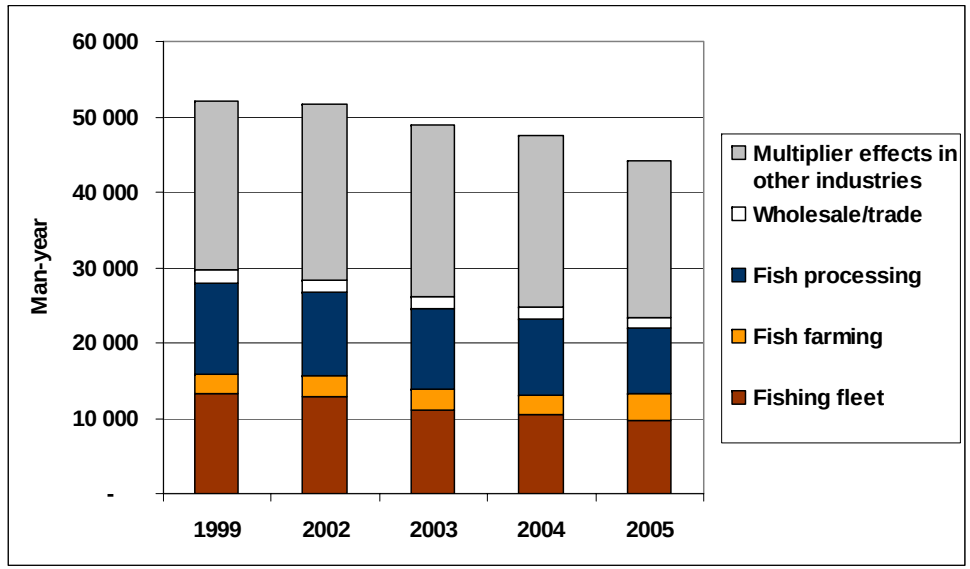
Main steps

1. Mapping the size (scope) of all
   - core activities within the Fisheries and Aquaculture Industry
   - size and composition of deliveries to the industry (direct and indirect-called multiplier effects)
2. Establish a data basis for model calculations – connecting detailed figures for the industry with main figures in the National Accounts
3. Modelling and calculation of direct and indirect multiplier effects of the core activities
4. Analysis and reporting

Fisheries and Aquaculture industry - Employment (2005)

- The core activities constitutes approx. 23 000 fultime man-years
- The man-years in core activity have decreased by 21 % from 1999 to 2005
- Every man-year in the core-activities creates 0,93 man-year in other industries in Norway – approx. 21 000 man-year
- The number of man-years in related industries have decreased by 7 % from 1999 to 2005

More than 44 000 man-years in Norway have their basis in the Fisheries and Aquaculture Industry



Value added- contribution to GNP

- Contribution to Gross National Product (GNP) is in this context a measure in the National Accounts and a term describing the Value Added created by the industry

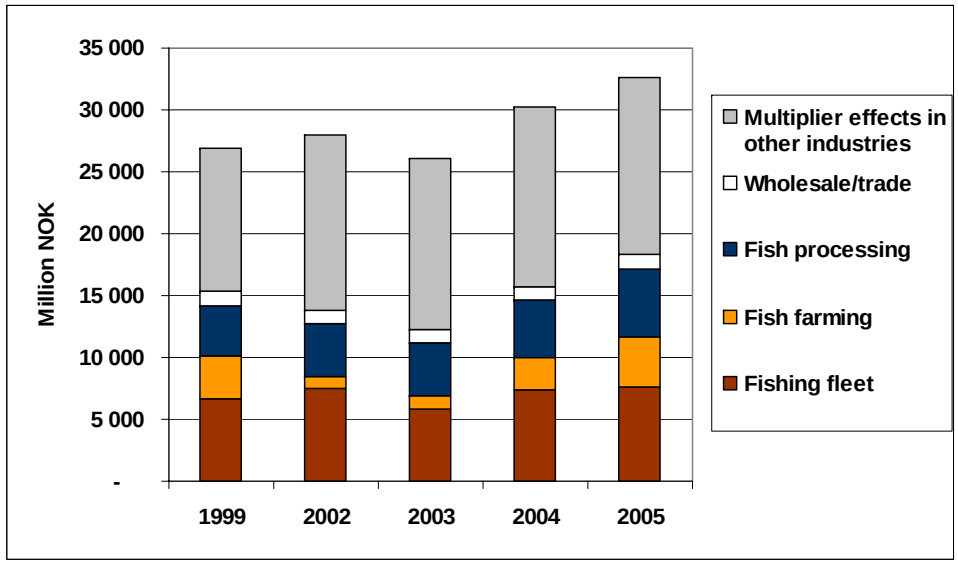
- Contribution to GNP will in this analysis be understood as remuneration to work and capital

Fisheries and Aquaculture industry - Value added (2005)

- The core activities creates a Value Added (contribution to GNP) of 18 billion NOK or more than 2 billion €

- Every NOK Value Added in the core-activities creates 0,72 NOK in value added in other industries in Norway

The total value added is more than 32 billion NOK

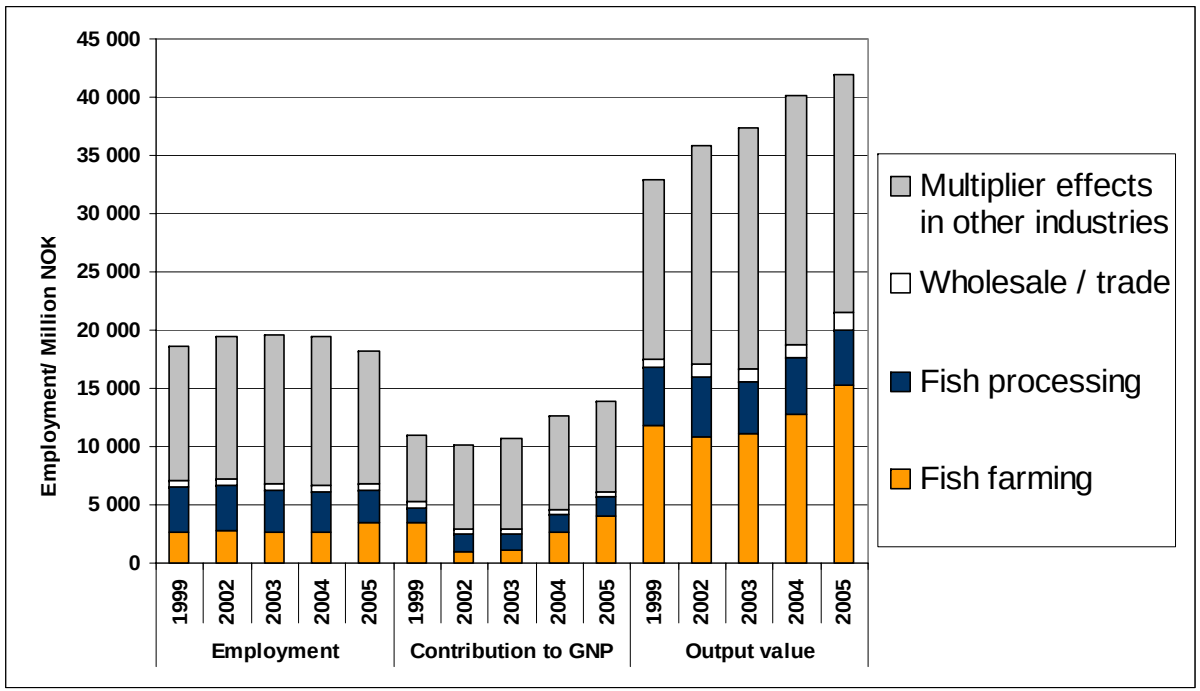


Aquaculture

Photo: Nutreco

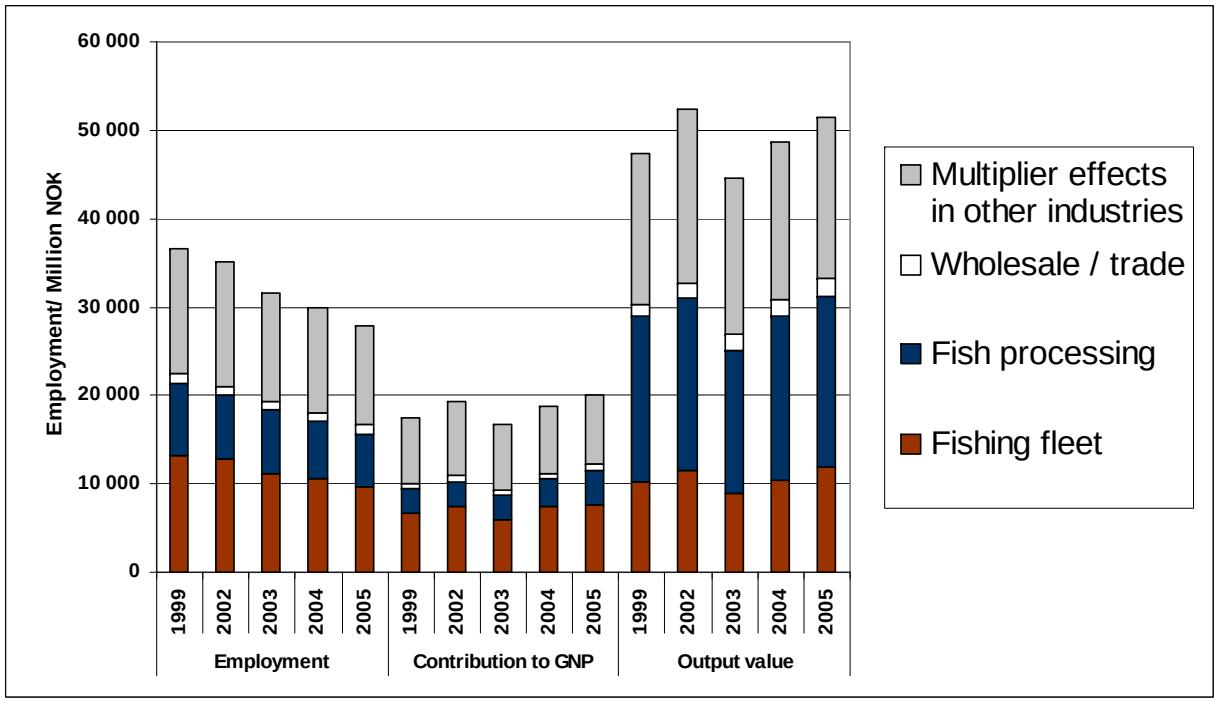
- The employment is stabile
- Strong increase in the contribution to GNP from the core activities
- Strong increase in production value from 2003 to 2004

High salmon prices, together with cost reduction can explain this



Fisheries

- Decrease in employment
- Increase in the contribution to GNP from 2003 to2005, due to fishing fleet sector
- Increase in production value from 2003 to 2005



Summing up

- The multiplier effect studies are useful in order to document that innovation is going on in the industry:
  - Reduced employment
  - Higher contribution to GNP
- It is also possible to get a picture of goods and services directly purchased by the industry. This might indicate high or low innovation activity, but not necessarily.
- Retro perspective

Definition of innovation

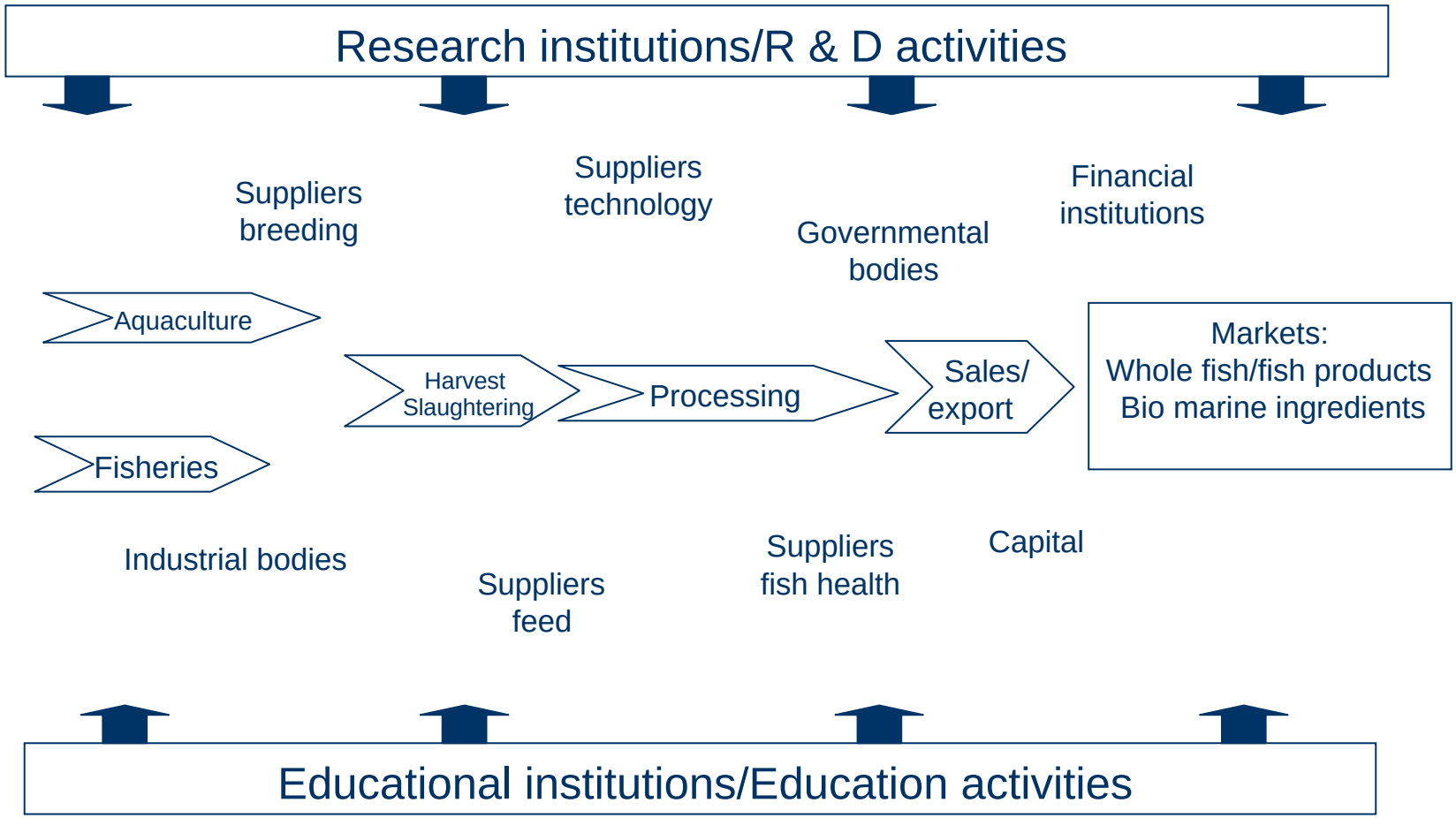
- New or changed products or services
- New or changed processes
- New or changed management/organisation
- New markets or new raw materials

- In addition this must be fulfilled;
  - Launched in market or to the public
  - News for the company

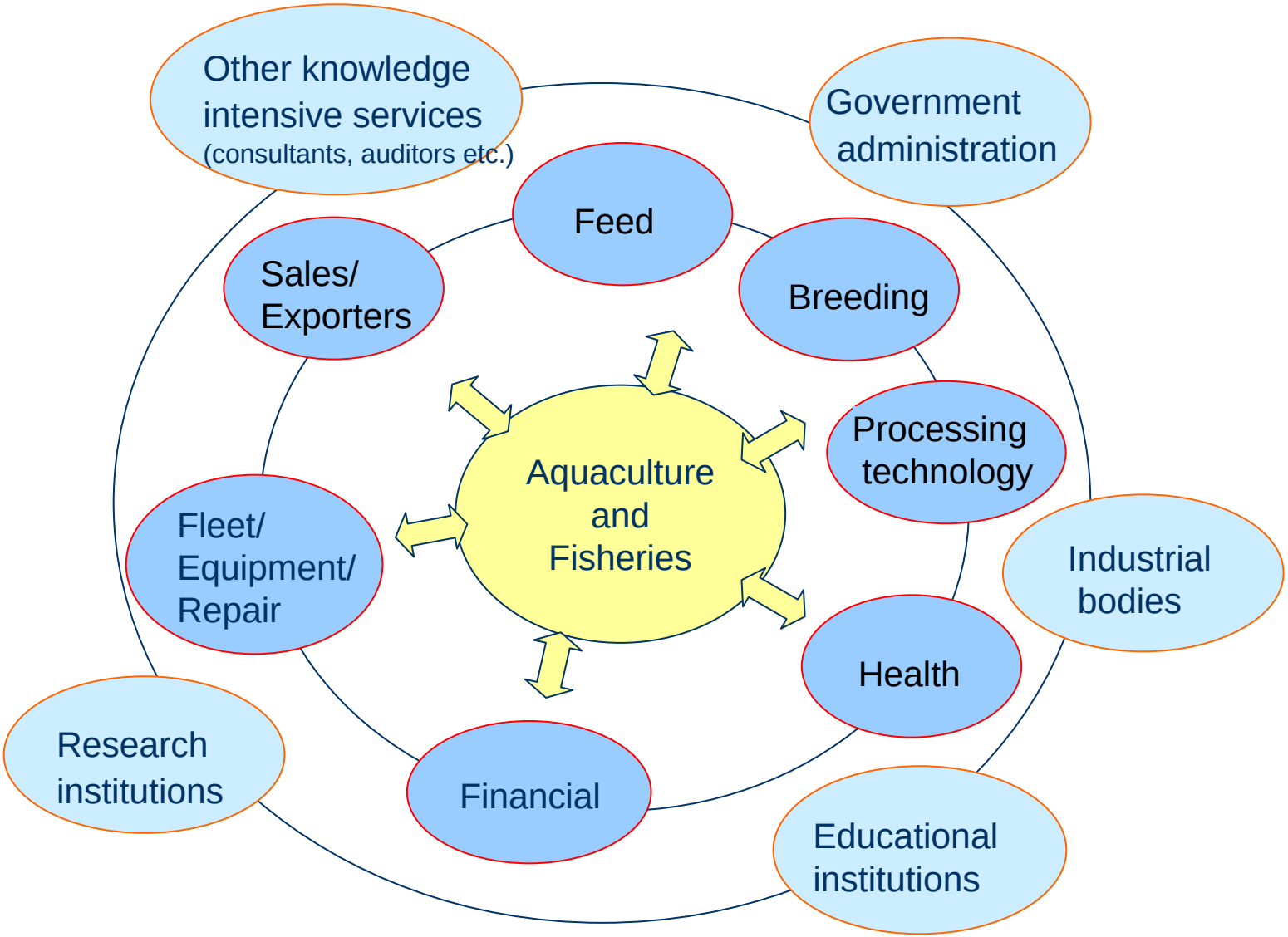
Important actors in the industries` innovation system

- Research institutions
- Suppliers
- Companies in the core activity

Expertise based value adding



The Norwegian innovation system



Research- and educational activity

- Research activity is very important, especially in relation to:
  - Diseases
  - Breeding
  - Feed
  - Technology (aquaculture and fisheries)
  - New species

- 20 public, semi-public and private research institutions
- Clustered in four main areas (Northern, Mid, Western and Eastern Norway)
- In 2007 more than 2,2 billion NOK was granted to marine innovation activity (From the Department of Fisheries and Coastal Affairs and Innovation Norway).

Suppliers to aquaculture

- Important external competence providers to companies in the core activity
- The supply industry is growing and structural changes take place
- Some are big, specialised and advanced (feed, vaccines, breeding material etc.)
- Others are smaller, but still specialised (cages, nets etc.)
- Suppliers always had innovation processes and cooperation with research institutions
- More institutional; Like in CREATE

Suppliers to aquaculture: Innovation activity

Classes of innovations	Suppliers in aquaculture, "Answered yes"
Has the company developed new or adjusted existing products or services in 1999-2001?	71 %
Did the company start using new or improved processes in 1999-2001?	64 %
Did the company develop or introduce new processes/products/services that failed (in the period 1999-2001) or are they still working on them?	69 %
Has the company been in involved in one out of the three named activities?	93 %

Barriers for innovation

- Financial muscles
- Resources/people in own organisation
- Imitation of products and processes
- Lack of knowledge of what is going on in the R & D community

The core activity

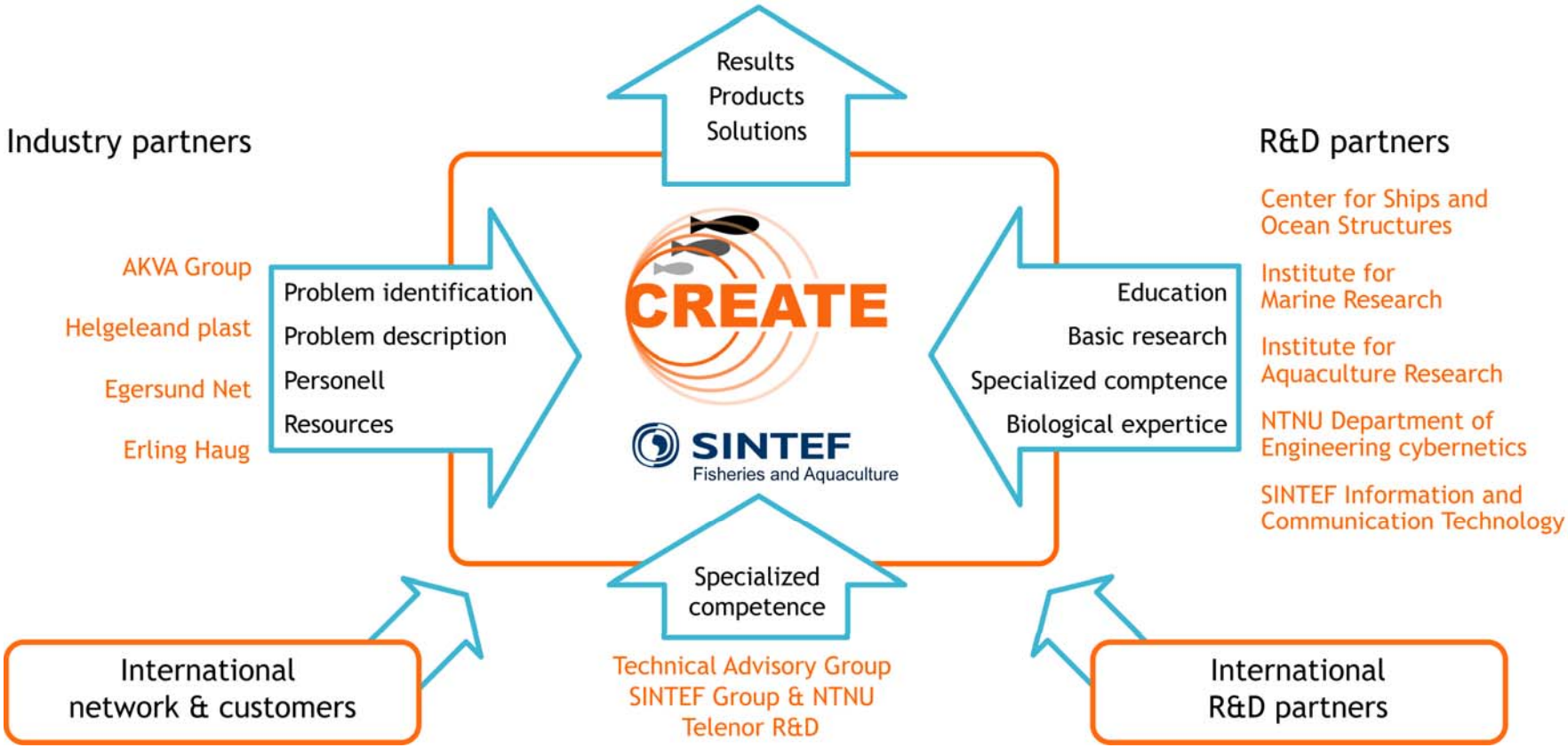
- Traditionally (STEP, 2002)
  - Few resources used on external acquisition of R & D
  - Little R&D in house
  - “Buy” knowledge through their suppliers
  - Careful (and a bit sceptical) to establish and/or take part in innovation projects
  - Same as the suppliers: lack of financial muscles and human resources
- Is changing now, due to structural changes in the industry
- The industry is heterogeneous and the companies have different innovation strategies.
- Long “distance” between the enterprises and scientific institutions.

Educational background of employees in fish farming in 1992 and 2002

	1992 Operation of fish farms	2002 Operation of fish farms
Unknown	0,8	3,0
Primary education	74,0	47,6
Craft certified	0,4	1,0
Secondary education	15,8	33,9
Other fields 1-4 yrs	2,9	4,4
Other fields 5+ yrs	0,3	0,4
Natural Sciences 1-4 yrs	1,9	3,8
Natural sciences 5+ yrs	1,1	1,2
Econ 1-4 yrs	0,9	2,5
Econ 5+ yrs	0,1	0,1
Engin 1-4 yrs	0,7	0,9
Engin 5+ yrs	-	-
Others	0,9	1,1
	100	100

Source: STEP based on the Firm and Enterprise Register, SSB

Close collaboration between the industry and research partners



Survey on innovation activity in Norway

Nace (SN2002)	Units with co-operation	Units with co-operation	Co-operation partner							
	Number of	Per cent[1]	Other enterprises within your enterprise group	Suppliers	Clients or customers	Competitors	Consultants	Commercial labs, or private R institutes	Universities or higher education institutes	Government or private research institutes
			%	%	%	%	%	%	%	%
Fish hatcheries and fish farms	22	73	36	77	41	14	41	59	50	63
All industries	1 024	33	44	72	70	37	51	40	44	48

Source: Statistics Norway

Summing up

- Is the multiplier effect studies useful in terms of measuring innovation activity?
- The multiplier effect studies are useful in order to document whether innovations have happened or not
- If we want more knowledge about the innovation system and how it works, additional studies must be carried out.