Innovation in the NZ Seafood Industry

Andrew Jeffs
a.jeffs@niwa.cri.nz
Ph. 09-375-2048
Literature Review

Relatively little useful information on innovation in seafood industry in NZ or overseas

Overseas –
limited scope & content – no useful research models or comparative data – related industries some useful material

NZ –
small amount of relevant material from the last decade – mostly focussed on research and development rather than innovation per se.

Working with Shantha to update & publish
Innovation in NZ seafood industry

Key Issues from Literature Review:-

• Focus on production, process & quality innovation – rather than further down the value chain
• High proportion of research expenditure on resource information - bureaucracy a business obstacle
• Poorly developed innovation management processes
• Poor integration of industry with sources of innovation expertise
• Low private sector investment in R & D.
Conclusions

1. Measure the effectiveness of innovation expenditure in the seafood sector - follow up to 1994 industry survey
2. Characterise how well innovation is managed within seafood enterprises – repeat NZIM Management Capability Index
3. Identify why the strong focus on production & process innovation, over and above product and market innovation - mussel industry case study.
4. Developing an understanding of the perceived failure of research providers to be seen by the seafood industry as a reliable and effective source of innovation - Not sure how to address this one?
Mussel Industry Case Study

What are the features of the innovation that lead to spectacular growth in this new industry?
Mussel Industry Case Study

What are the features of the innovation that lead to spectacular growth in this new industry?

Pioneering/entrepreneurs – strong collaboration
Early focus on efficiency, production, process
Evolutionary innovation
Strong DIY – inhouse innovation
Later focus on supply chain, quality, market innovation and increasing vertical integration – associated with corporatisation and fierce competition.
Increasing use of external innovation sources
Market knowledge now incorporated into production
Novel innovation management approaches emerging
Striving for revolutionary innovation

Results as a report and perhaps later publication
Rock Lobster Study - Basil

Rate of technical change increased over 1992-2000 period
• Reduced fleet
• Shifted season
• Catch aggregation
• Less labour per catch
• Rapid adoption of off the shelf technology

Focus of innovation on efficiency, production and quality, rather than new product opportunities

Conference presentation & proceedings – further paper?
Innovation Survey

Key Issues

• Purpose?
  - General & comparative e.g. NZ Stats 2003 & plans for 2005
  - Drill in from preliminary results e.g. management of innovation, value chain
  - Sector differences e.g. catching, growing, processing, marketing

• Other Researchers Expectations?

• Other issues e.g. getting responses
Current State of Innovation and Growth of NZ Seafood Sector

Basil – crunching numbers for econometrics of technical change in the NZ aquaculture industry

Andrew – information gathering on NZ aquaculture industry
General Seafood Industry Overview

Prepared general material to provide general overview of aquaculture industry, & some seafood industry.

Need clarification on key points for this work
Need to provide some structure?
Other contributors & their components?
Output format & intended audience?

Draft content follows....
Global Aquaculture

![Graph showing global aquaculture and wild fisheries from 1990 to 2000. The graph displays the trend and comparison between aquaculture and wild fisheries over the years.](image)
Global Aquaculture

- Asia (Mainly China)
- Europe
- South America
- North America
- Africa
- Oceania - including New Zealand
Global Aquaculture

Average annual percentage growth (%)

- South America: 14%
- Oceania: 13%
- Asia: 12%
- Africa: 10%
- North America: 5%
- Europe: 4%

Global Region
Rapid Growth of N.Z. Aquaculture

Production Value
1975 - $10,000
2001 - $280 M

Very Strong Growth
Faster than global average of 10% p.a.
i.e. around 20% p.a.
Future N.Z. Aquaculture

NZ Aquaculture Export Projections (NZD m FOB) 2000-2020
(NB: 15% is the global aquaculture growth rate)

Production Value
>$1B by 2020
Growth at ≈8%
Australian Aquaculture

- Growth of 13% per year since 1990
- Predicted to reach $2500M by 2010
New Zealand Aquaculture

- Three main species
- >70% from one species
- >80% filter feeding shellfish
- No significant land-based industry
Australian Aquaculture

- Five main species, 40 species in total
- <35% from one species
- <50% filter feeding shellfish
- Significant land-based industry
New Zealand vs Australia

- New Zealand: 74%
- Australia: 17%

New Zealand:
- Abalone
- Mussels
- Tuna
- Abalone
- Oysters

Australia:
- Marron, yabbies
- Sydney Rock Oysters, trout, Murray cod, Yabbies
- Pearls, barramundi, prawns, redclaw, oysters, and crocs
- Salmon
- Abalone
- Oysters, Trout
- Pearls, Pearls, Pearls

NIWA
Teikoku Nukerōki
Patterns of Aquaculture Growth

1985

Expansion of same species locally & then into similar locations

2003

Recent offshore initiatives
New Zealand Aquaculture

- Mussel 14% value of global production (<5% volume)
- Salmon <3% value global production
- Oysters 0.003% value global production
Australian Aquaculture

- Tuna 67% value of global production
- Pearls 35% value global production
- Salmon 5% value global production

The World

Australia
New Zealand vs Australia

N.Z. - 160,000 tonnes = NZ$280M

N.Z. NZ$1,750/t

Australia – 30,000 tonnes = A$680M

Australia A$22,667/t

We are farming generally low value species & products
Use of Marine Farm Space

About 4,000 hectares total growing space

Mussels: ~$24,000/hectare
  - $50M industry needs 2,000ha

Oysters: ~$110,000/hectare
  - $50M industry needs 450ha

Finfish: ~$3-5,000,000/hectare
  - $50M industry needs 16ha

We are getting relatively poor returns on our marine farm space
Example of N.Z. Aquaculture

New Zealand King Salmon Ltd

2002 – 7 hectares of fin fish farm
– 6,000 t of premium fish
– $60M, mostly from exports
– 330 jobs, mostly regional
– acceptable environmental impact, highly localised
Regional Aquaculture

Why the marked difference?

South Australia from 1999 – 2002
• Tuna A$202 – $278M
• Oyster A$9.4 - $15.2M
• Abalone A$1.8 - $3.6M
• Salmon, kingfish, snapper A$0.5 - $16M
• Mussels A$0.25 - $1M

NIWA
Regulatory Environment

Government Attitude and Capability
e.g. Aquaculture Law Reform

New Zealand
Discussed through 1980’s
Discussion document 1989
Abandoned 1991
Discussed through 1990’s
2nd Discussion document mid 2000
Moratorium bill late 2001
Waitangi Tribunal findings 2003
National aquaculture hui tour 2003
Seabed and foreshore court decision......
Cost to industry - millions

South Australia
Discussed 2000
Formal discussions July 2001
Draft legislation Dec. 2001
Legislation in force July 2002

Minimal cost to industry
Regulatory Environment

**RMA**
- RMA good framework for protecting environment
- Costly & cumbersome for industry growth
- Conflicts with other users (different legislation)
- Good potential for community involvement, but also highly influenced by public attitudes & administrators
- Flexible enough to try new locations & species
- Adversarial process & outcomes

**AMA**
- AMA’s species/methods prescriptive – promotes the expansion of existing industry
- Experimental areas will be lost
- Must be suitable for farming
- Associated with business failures
Business Environment

• High fishing industry involvement
• Focus on efficiency & growth by expansion (low risk & easily retrenched)
• Poorly coordinated & lack of leadership
• Few government support schemes
• Low government & industry investment in R & D
• Small venture capital base
• Cautious investment attitude – low risk
• Short term focus & limited planning
• High compliance costs
• Difficult regulatory environment
• Negative public attitudes
• Anti-foreign involvement & poorly connected offshore

Adds up to a “making money from mutton mentality”
Foreign Technology/Investment

New Zealand
Oysters – Europe
Salmon – Norway
Mussels – Japan
Scallops – Japan

Australia
Pearls – Japan
Salmon – Norway
Tuna – Japan
Prawns – Taiwan

Foreign technology and investment drives major aquaculture development
Environmental & Social Impact

1. Over-emphasis on environmental impact localised & reversible – trivial compared to 250M tonnes of dirt dumped each year
2. Cumulative environmental effects might be a bigger issue
3. Public & institutional perceptions are skewed & often ill informed
4. Visual pollution not always an issue
5. Conflicts with other users poorly understood
6. Positive economic & social outcomes not always considered fully (RMA Section 5)
Maori

- Currently own around half of NZ aquaculture activities & involved in offshore mussel initiatives

- Keenly interested in expanding their involvement, especially with $700M of dispersed seafood assets

- Increasingly important politically in terms of seabed & foreshore

- Traditionally very cautious investors

- Will push for expanding existing marine farm interests
Aquaculture Industry Bodies

• 1998 Seafood Industry Strategy
  By 2010 - $569M of production needed
    Mussels – 2,650ha to 4,000ha
    Salmon – 45ha to 75ha
    Oysters – 1,050ha to 1,250ha
  Totals - 3,745ha to 5,325ha

• 2001 – Aquaculture Council
  By 2020 - $1B of production from
  17,000 ha of farms & generating 9,180FTE
Regulators/Planners

- Caught in the crossfire – ill informed public, Maori pushing rights, increasingly politically effective marine farm lobby, lack of government leadership on key issues

- Focused on the short term outcomes – rather than setting an enduring framework & a vision for innovative aquaculture growth
New Zealand Aquaculture: What should be on the horizon?

- Aim for better value from farm space
- Diversify the species farmed (move to higher value)
- Diversify the end products (move to higher value)
- Improve farming technology to reduce conflicts/impacts
- Diversify aquaculture geographically

i.e. innovation at every level!
Conclusions

The challenge is to provide a framework & business environment that fosters innovation in the aquaculture industry

What do we recommend?