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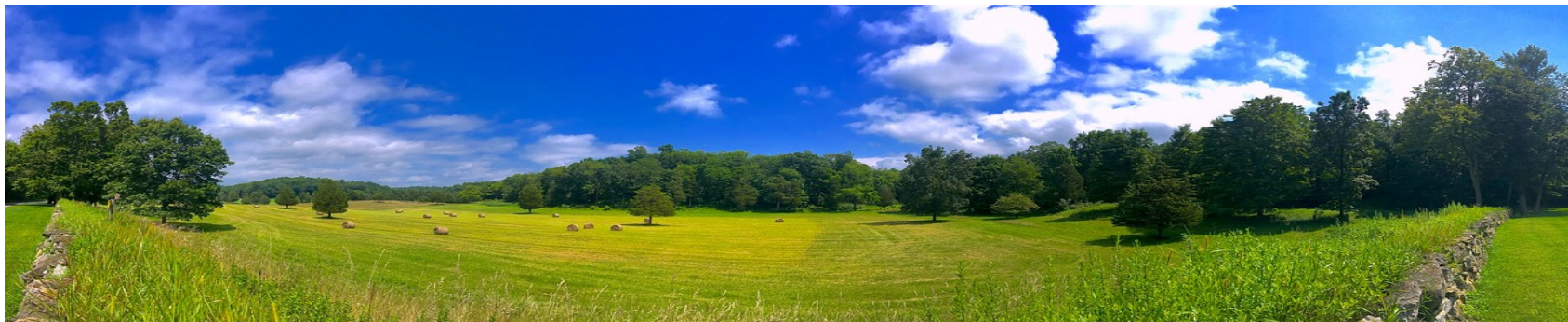
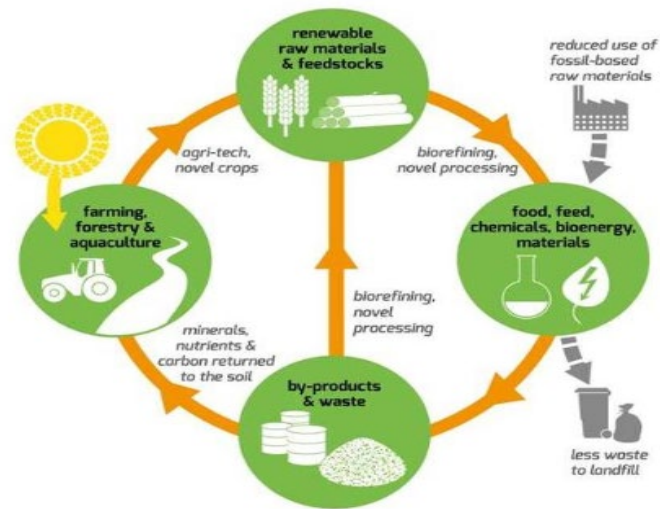
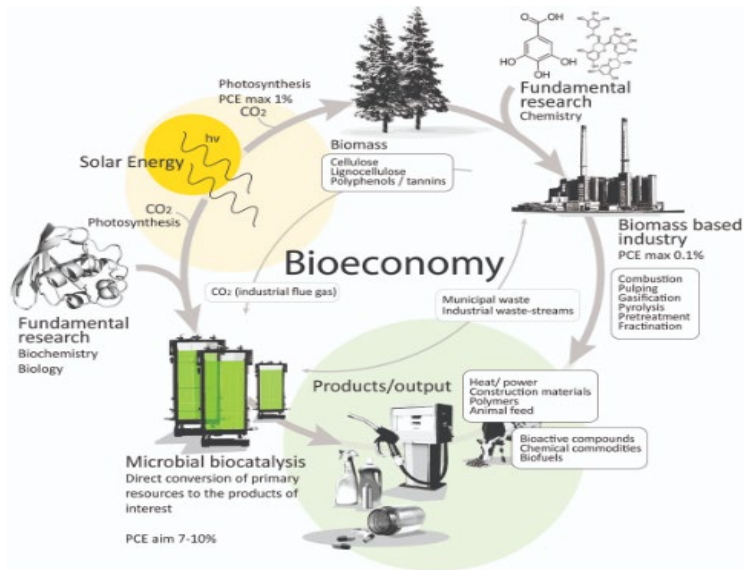
Olav Wicken

Centre for technology, innovation and culture  
University of Oslo

# Regions, natural resources and development



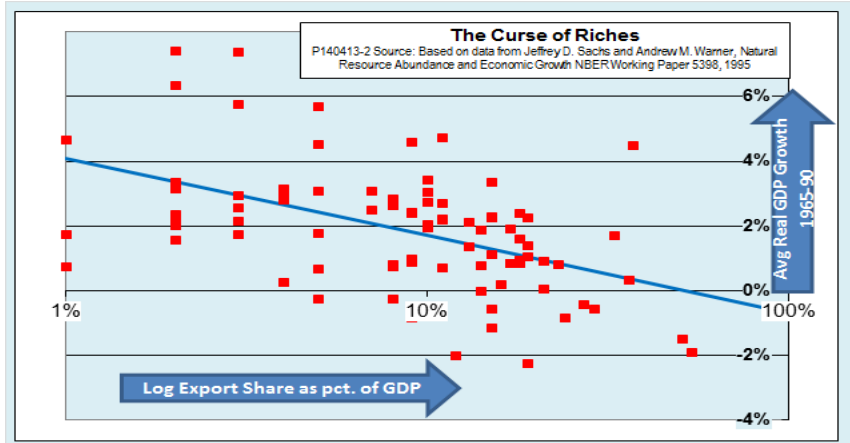
# Bioeconomy – a good economy?



PART 1

# **NATURAL RESOURCES IN ECONOMIC GROWTH & DEVELOPMENT**

# The Resource Curse & «Dutch Disease»



Natural resources

**Boom** – high price,  
increased income.  
Effect on currency, salaries

Increase costs,  
reduction  
Manufacturing

Expansion  
Non-Traded  
(services)

**Why is this a problem? the knowledge economy argument**

# Natural Resource Based – Knowledge Economy

Rank		Country/Territory	2018 HDI [6]
2018 rankings [6]	Change in rank from previous year <sup>[6]</sup>		
1	—	Norway	0.953
2	—	Switzerland	0.944
3	—	Australia	0.939
4	—	Ireland	0.938
5	▼ (1)	Germany	0.936
6	—	Iceland	0.935
7	▲ (1)	Hong Kong	0.933
7	—	Sweden	0.933
9	▼ (1)	Singapore	0.932
10	—	Netherlands	0.931
11	▼ (1)	Denmark	0.929
12	—	Canada	0.926
13	▼ (1)	United States	0.924
14	—	United Kingdom	0.922
15	—	Finland	0.920
16	—	New Zealand	0.917

Rank	Country	KEI	KI	Economic incentive regime	Innovation	Education	ICT
1	Sweden	9.43	9.38	9.58	9.74	8.92	9.49
2	Finland	9.33	9.22	9.65	9.66	8.77	9.22
3	Denmark	9.16	9.00	9.63	9.49	8.63	8.88
4	Netherlands	9.11	9.22	8.79	9.46	8.75	9.45
4	Norway	9.11	8.99	9.47	9.01	9.43	8.53
6	New Zealand	8.97	8.93	9.09	8.66	9.81	8.30
7	Canada	8.92	8.72	9.52	9.32	8.61	8.23
8	Germany	8.90	8.83	9.10	9.11	8.20	9.17
9	Australia	8.88	8.98	8.56	8.92	9.71	8.33

Source: World Bank Knowledge Economy and Knowledge Indexes (KAM 2012),

## NRBI contribute to wellbeing in a modern knowledge economy

# Industrial dynamics in NRBI: interaction between two parts

## Receipient sector

NRBI producer  
companies/ firms.  
Specialized in  
synthetic knowledge

RS creates  
demand &  
direction for ES



ES as problem  
solver for RS

## Enabling sector

Specialized hetero-  
genous knowledge  
intensive  
organisations: capital  
goods, KIBS,  
universities, labs

# Heterogenous types of knowledge - equality

## **Synthetic knowledge**

**Learning in production,  
practical, experience  
based**

**Localised knowledge  
bases in producers/ firms  
(sticky)**



## **Analytical knowledge**

**Enabling sector with  
formal education and  
R&D (use of science and  
technology based  
methodologies)**

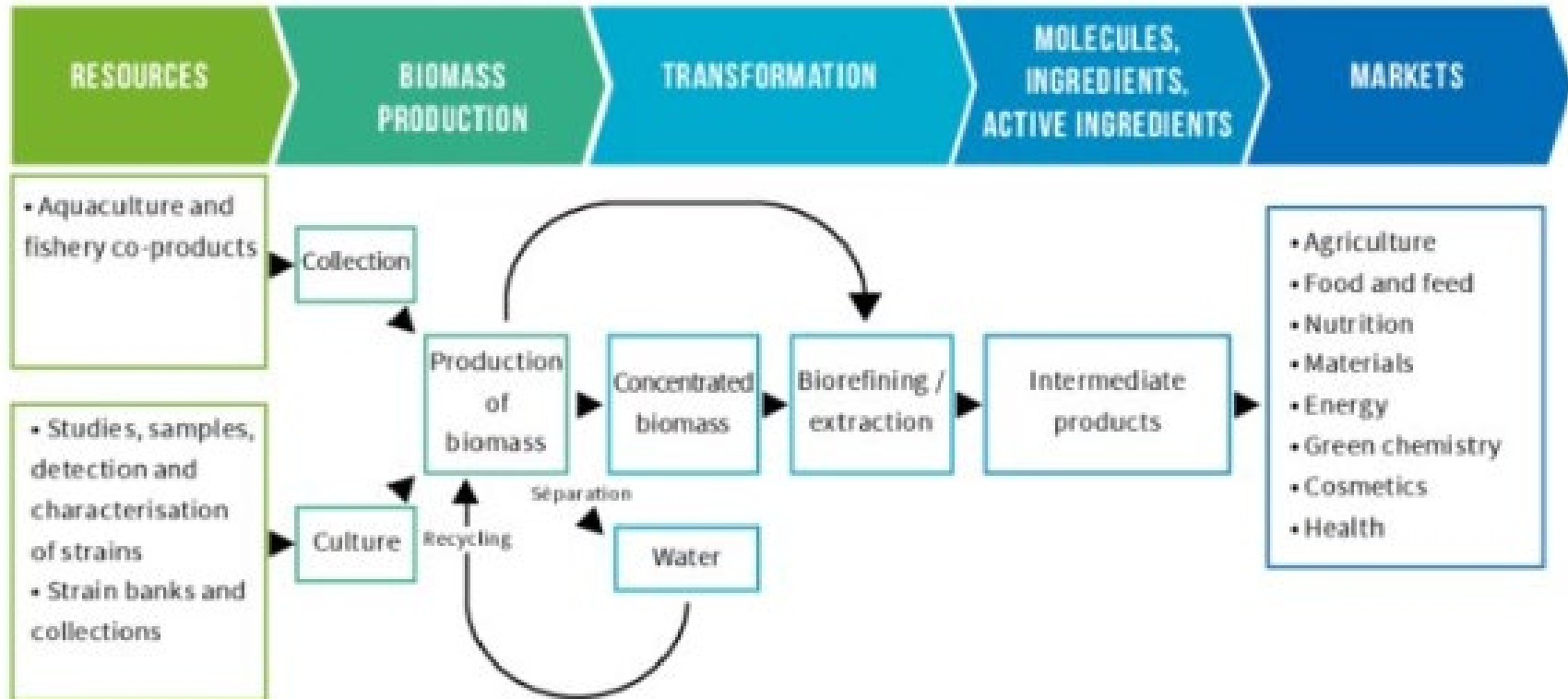
PART 2

# **NATURAL RESOURCES AND LOCAL DEVELOPMENT**



# Point of departure: value chains

## VALUE CHAIN: MASS PRODUCTION AND DEVELOPMENT OF BIOMASS



# Centralised & decentralised industrial dynamics

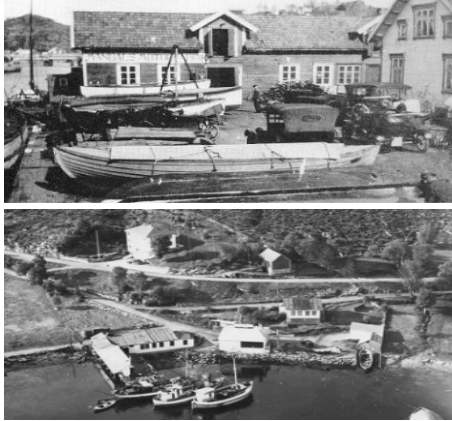
## Decentralised path

- Small scale companies
- Low capital intensity in production
- Local knowledge and networks for learning
- Open search for information out of local/regional
- Institutional set-up defined by informal norms/ local regulations
- No or limited internal R&D

## Centralised path

- Large-scale organisations
- Capital-intensive production
- Global knowledge and networks for learning/ search
- Firms shape 'rules of game'
- Internal R&D (lab)

# Case 1: fisheries



# Case 2: Forestry



Del 3

# **SUSTAINABILITY**

# **ROLE OF LOCAL NATURAL ENVIRONMENT**

# Natural diversity & ideosyncrasy

*“The natural environment participates in a very direct way in the productive process. As a result, agriculture is always immersed, as manufacturing is not, in a unique ecological context [where] the success of an individual crop will depend on a delicate combination of qualities supplied by the environment – topography, rainfall, sunlight, temperature variations, chemical composition of soil, etc.”*  
(iRosenberg 1976)



## The Salmon Disease Crisis in Chile

FRANK ASCHE, HÅVARD HANSEN, RAGNAR TVETERAS  
University of Stavanger

SIGBJØRN TVETERÅS

CENTRUM Católica, Pontificia Universidad Católica del Perú

**Abstract** *The Chilean salmon farming industry is currently facing unprecedented economic losses related to the infectious salmon anemia (ISA) disease. Production of Atlantic salmon is being reduced from almost 400,000 tonnes in 2005 to an estimated 100,000 tonnes in 2010. The spread of and response to the disease raises a number of important issues with respect to the actions of the companies involved as well as the regulatory body. It is particularly interesting that adequate measures have not been implemented in Chile, as the species is farmed in relatively few countries and, as such, is fairly transparent. Moreover, all other major salmon-producing countries have experienced the disease, and several of the largest companies in Chile are multi-nationals with first-hand experience with ISA from other countries.*

# Ideosyncrasy: creating niches for local innovation

- Niche: protection from global firms, limited market
- Local knowledge – practical skills to develop ideas for solution to specific conditions
- Demand for (basic) science and research to improve solutions

Can an Eco-Friendly Cod Trap Revive a 500-  
Year-Old Fishing Community?

BY ALLISON GUY • TUE, 2017-01-10 14:18

REBUILD OCEAN ABUNDANCE

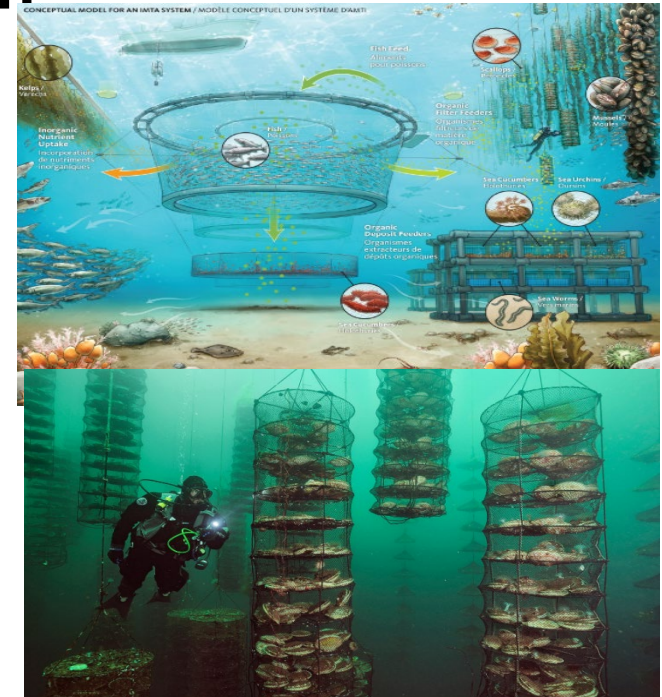


## Norwegian Study on Newfoundland Cod Potting



# Importance of local experimentation

- Experimentation – small scale, must be driven bottom up (followed by public sector support to scale up/ diffuse innovations)
- Support experiments: low capital cost tech & practical skills
- Include R&D/science



REVIEWS IN Aquaculture  
*Reviews in Aquaculture* (2012) 4, 209–220 doi: 10.1111/j.1753-5131.2012.01074

**Open-water integrated multi-trophic aquaculture: environmental biomitigation and economic diversification of fed aquaculture by extractive aquaculture**

Thierry Chopin<sup>1</sup>, John Andrew Cooper<sup>1,2</sup>, Gregor Reid<sup>1,2</sup>, Stephen Cross<sup>3,4</sup> and Christine Moore<sup>1,2</sup>

- 1 Canadian Integrated Multi-Trophic Aquaculture Network (CIMTAN), University of New Brunswick, Saint John, NB, Canada
- 2 Fisheries and Oceans Canada, St Andrews Biological Station, St. Andrews, NB, Canada
- 3 Department of Geography, University of Victoria, STN CSC, Victoria, BC, Canada
- 4 Kyuquot SEAfoods Ltd, Courtenay, BC, Canada



# Climate change adaptation

- Environment not any longer stable
- Demands continuous adaptation to changing (local) environment
- Need for continuous development of appropriate technologies



# Bottom-up strategy for local development

## Local experiments, researchers and platforms

- Start from initiatives in local communities
- Build networks and platforms to support and analyse initiatives over time
  - Network between people with both synthetic/practical knowledge and analytical/ theoretical to solve problems together
  - Adapt/ stop experiment if long term negative implications
- Developing policy instruments adapted to support promising local experiments

*Thank you!*