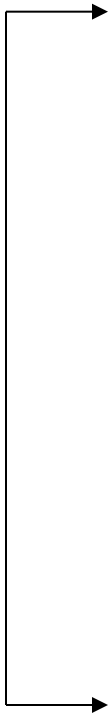
Exploring the rural eco-economy beyond neo-liberalism

Terry Marsden

Approach

The Transition:

- **Sustainability science**
- **Sustainable place making**
- **The framing and coproduction of science**
- **Governance models and Planning**



L E N S E S

- **Rural and Urban Communities**
- **Agri food systems and the bio economy**

(Global, Regional, Local)

Sustain Sci
DOI 10.1007/s11625-014-0287-z

SPECIAL FEATURE: ORIGINAL ARTICLE

Pathways towards sustainable landscapes

Natural powers: from the bio-economy to the eco-economy and sustainable place-making

Terry Marsden · Francesca Farioli

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Abstract The current intensification of efforts to develop post-carbon solutions to the global food/energy security problems is developing a highly contested policy/technology/production/consumption arena. The paper examines how current attempts to resolve these new productivist priorities are embedded in combinations of sustainability, security, sovereignty and resource governance concerns. These con-

Keywords Bio-economy · Eco-economy · Post-normal science · Sustainable place-making · Agri-food · Security · Rural–urban development

Introduction: back to the bio-sphere

The New sustainable Agri-food and Rural Paradigm

- A new ,multi-sector, place-based approach to rural development with closer links between rural and urban economy.
- Rural areas as part of more dynamic regions.
- Shift from subsidy-driven to more variable development through investments.
- Exploiting and valorising hitherto unused resources (OECD,2006).

Article

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Exploring the 'New Rural Paradigm' in Europe: Eco-economic strategies as a counterforce to the global competitiveness agenda

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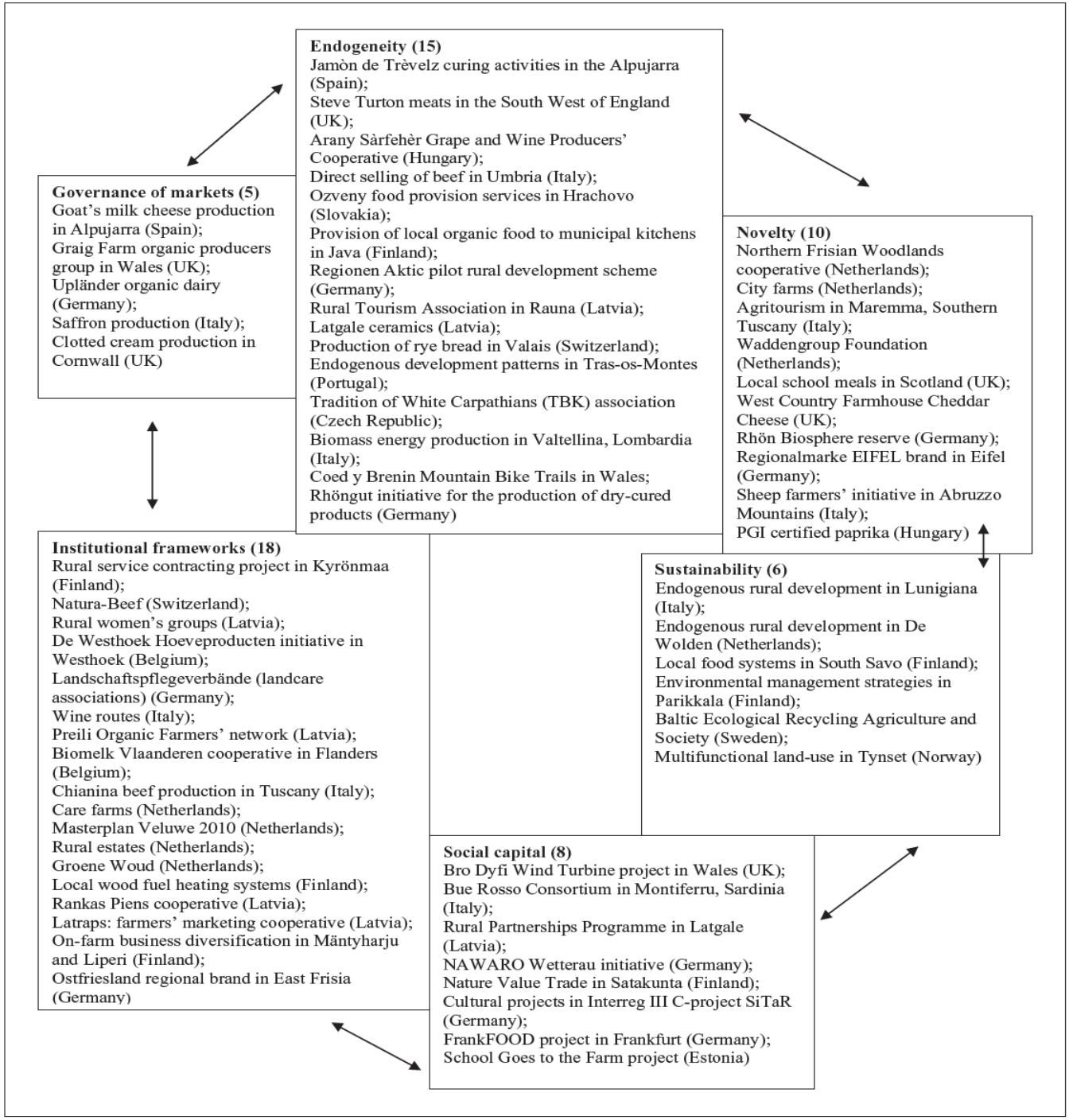
Cardiff University, UK

Abstract

Rural regions in Europe are facing diverging pathways of development. On the one hand, the influence of urbanisation and the intensification and continued up-scaling of agriculture make it more difficult for many regions to remain distinctive and increase sustainability. Places, as well as goods and services, have become increasingly interchangeable. For many regions an obvious choice is to compete with other regions for global mobile capital and labour. On the other hand, and as a counterforce to these global logics, new strategies, which are more place-based, are being developed, such as the construction of identities or images around new agricultural goods and services. These strategies can be seen in the context of the 'New Rural Paradigm' for European rural regions. In the search for new trajectories for sustainable development, different models can be identified: the bio-economy paradigm and the eco-economy. Each model has its own sustainability claim and can be analysed in the context of the overarching development theory of ecological modernisation. The central question in this article is what types of strategies and pathways for eco-economic development can be witnessed in rural regions in Europe? The empirical analysis is based on 62 European cases. Three key eco-economic strategies that show a shift from an agricultural-based development to a more integrative rural and regionally based development are identified. The article concludes with some consistent parameters for understanding the dynamic complexity of rural regional development.

Keywords

Branding, eco-economy, new rural paradigm, regional development, regional strategies, rural development, sustainability


Endogeneity (15)
Jamòn de Trèvelz curing activities in the Alpujarra (Spain);
Steve Turton meats in the South West of England (UK);
Arany Sàrfehèr Grape and Wine Producers' Cooperative (Hungary);
Direct selling of beef in Umbria (Italy);
Ozveny food provision services in Hrachovo (Slovakia);
Provision of local organic food to municipal kitchens in Java (Finland);
Regionen Aktic pilot rural development scheme (Germany);
Rural Tourism Association in Rauna (Latvia);
Latgale ceramics (Latvia);
Production of rye bread in Valais (Switzerland);
Endogenous development patterns in Tras-os-Montes (Portugal);
Tradition of White Carpathians (TBK) association (Czech Republic);
Biomass energy production in Valtellina, Lombardia (Italy);
Coed y Brenin Mountain Bike Trails in Wales;
Rhöngut initiative for the production of dry-cured products (Germany)
Governance of markets (5)
Goat's milk cheese production in Alpujarra (Spain);
Graig Farm organic producers group in Wales (UK);
Upländer organic dairy (Germany);
Saffron production (Italy);
Clotted cream production in Cornwall (UK)
Novelty (10)
Northern Frisian Woodlands cooperative (Netherlands);
City farms (Netherlands);
Agritourism in Maremma, Southern Tuscany (Italy);
Waddengroup Foundation (Netherlands);
Local school meals in Scotland (UK);
West Country Farmhouse Cheddar Cheese (UK);
Rhön Biosphere reserve (Germany);
Regionalmarke EIFEL brand in Eifel (Germany);
Sheep farmers' initiative in Abruzzo Mountains (Italy);
PGI certified paprika (Hungary)
Institutional frameworks (18)
Rural service contracting project in Kyrönmaa (Finland);
Natura-Beef (Switzerland);
Rural women's groups (Latvia);
De Westhoek Hoeveproducten initiative in Westhoek (Belgium);
Landschaftspflegeverbände (landcare associations) (Germany);
Wine routes (Italy);
Preili Organic Farmers' network (Latvia);
Biomelk Vlaanderen cooperative in Flanders (Belgium);
Chianina beef production in Tuscany (Italy);
Care farms (Netherlands);
Masterplan Veluwe 2010 (Netherlands);
Rural estates (Netherlands);
Groene Woud (Netherlands);
Local wood fuel heating systems (Finland);
Rankas Piens cooperative (Latvia);
Latraps: farmers' marketing cooperative (Latvia);
On-farm business diversification in Mäntyharju and Liperi (Finland);
Ostfriesland regional brand in East Frisia (Germany)
Sustainability (6)
Endogenous rural development in Lunigiana (Italy);
Endogenous rural development in De Wolden (Netherlands);
Local food systems in South Savo (Finland);
Environmental management strategies in Parikkala (Finland);
Baltic Ecological Recycling Agriculture and Society (Sweden);
Multifunctional land-use in Tynset (Norway)
Social capital (8)
Bro Dyfi Wind Turbine project in Wales (UK);
Bue Rosso Consortium in Montiferru, Sardinia (Italy);
Rural Partnerships Programme in Latgale (Latvia);
NAWARO Wetterau initiative (Germany);
Nature Value Trade in Satakunta (Finland);
Cultural projects in Interreg III C-project SiTaR (Germany);
FrankFOOD project in Frankfurt (Germany);
School Goes to the Farm project (Estonia)

Principles

- Protect
- Provide
- Predict
- Promote
- Stranded assets
- Latent assets
- Community businesses
- Diversify and distribute

The counter-tendencies

- Continued cost-price squeeze in agriculture and financialisation of land based primary sectors
- Crises in the intensive agri-food regime: disease, food risks, carbon emissions, bio-diversity loss, health concerns.
- Further centralisation of service infrastructures with public sector austerity measures (e.g Devon, Shetland since 2010)
- Further demographic ‘draining’ from rural heartlands.

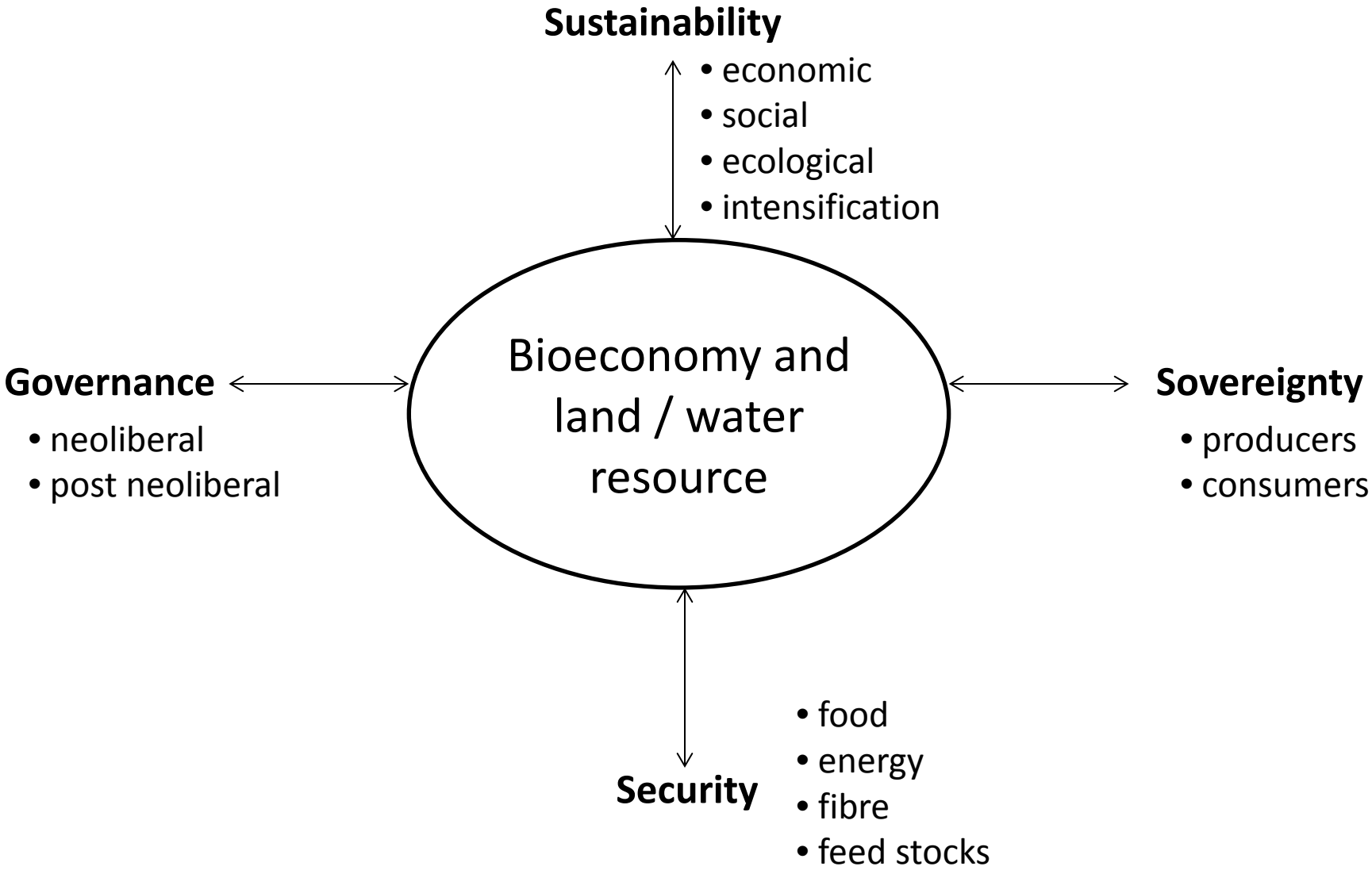
Centralisation as neo-liberal regulation

- Spatial concentration of function and services: ‘smart city regions’.
- Concentration of buying power in food and energy systems; feed- in tariffs, retailer-led contracts.
- Centralisation and corporatisation of science and R&D.
- ‘Tradable’ and replaceable eco-system services.

Towards the distributed economy

- Rural areas are the source and origin of distributed and distributive systems. Rural eco-system services are dispersed not centralised.
- Example: BBNPA provides 90% of water services to Cardiff, and 78% to Swansea.
- Example: Three National parks in Wales provide £557 million GVA (1.2% Wales Economy) 12 mill visitors and 13,000 jobs across Wales.
- Example: 40% of employment linked to environment-dispersed and often small scale.

The Bioeconomy and Resource Governance



Phases in food governance and financial regulation

Earthscan Food and Agriculture

earthscan from Routledge

Edited by Terry Marsden and Adrian Morley

Sustainable Food Systems

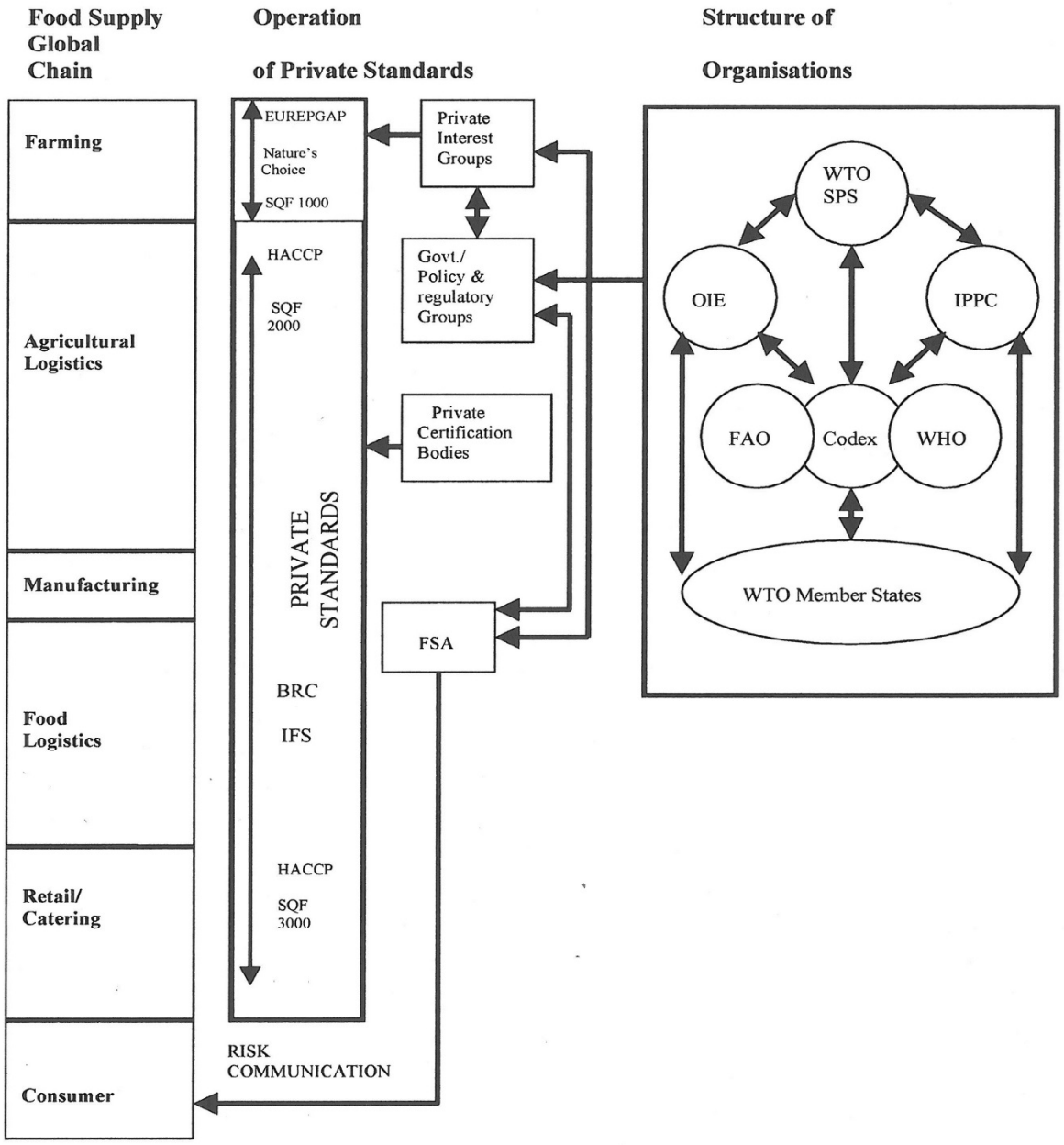
Building a New Paradigm

The New Regulation and Governance of Food

Beyond the Food Crisis?

Terry Marsden, Robert Lee, Andrew Flynn and Samarthia Thankappan

ROUTLEDGE



Regulation in the food supply chain and the role of different global organisations

Positioning food security and sustainability in the UK

Food Security High (Resilience)

Sustainability High (Resilience)

1954 - 1984

- High farming
- National productivism
- 94% self sufficiency
- 'Food from our own resources'
- Food prices decline as a percentage of household income

1984 - 2007

- Post-productivism
- Food scares associated with intensification
- Food surpluses
- 'Supermarketisation'
- Growing imports
- 60% self sufficiency

Sustainability Low (Vulnerability)

1930s - 1954

- 'Dig for Victory'
- Rationing
- Food and energy shortages

2007 - present

- 'Perfect storm'
- Neo-productivism
- Sustainable intensification
- Alternate food networks
- Rising household energy and food costs
- Financial speculation

Food Security Low (Vulnerability)

Box 1.2: Features of corporatist-interest food governance in the UK post-2010

- Minimal government intervention in setting the agenda for agri-food research and development.
- Stronger 'industrial' focus and focus upon export generation (especially to 'emerging economies').
- Focus upon reducing carbon emissions through market/trading mechanisms.
- Aggregated notions of sustainable intensification or 'getting more for less'.
- Reduced regulation with a continuous 'red tape review' of environmental and agri-food sectors.
- Compartmentalisation of food, health and nutrition and a focus upon labelling and consumer food 'choice'.
- Devolving of genetically modified food adoption to 'the consumer'.
- Allowing 'the market' to decide the structure and shape of the agricultural sector.
- Reduction in the 'burden' of statutory and regional planning down to a 'new localism' agenda.
- Maximisation of green credentialism built largely on voluntarism, 'responsibility deals' with food manufacturers and retailer and fragmented projects.
- An emphasis on corporate social responsibility relating to obesity, creating new lower calorie brand opportunities for corporate retailers and caterers.

Bonnano. A (2014: 27)

The limits of neo-liberalism are theoretically clear and empirically evident… existing contradictions make it problematic to argue about the existence of an organised system.. It appears more like a project in crisis, rather than a regime. Yet, and despite claims of economic unsustainability and lack of substantive democracy, neo-liberalism remains the dominant ideology, and in many instances,, the preferred political choice of the second decade of the twenty-first century.

Hall, S and Massey, D (2010) and emerging 'post-neo-liberal' state:

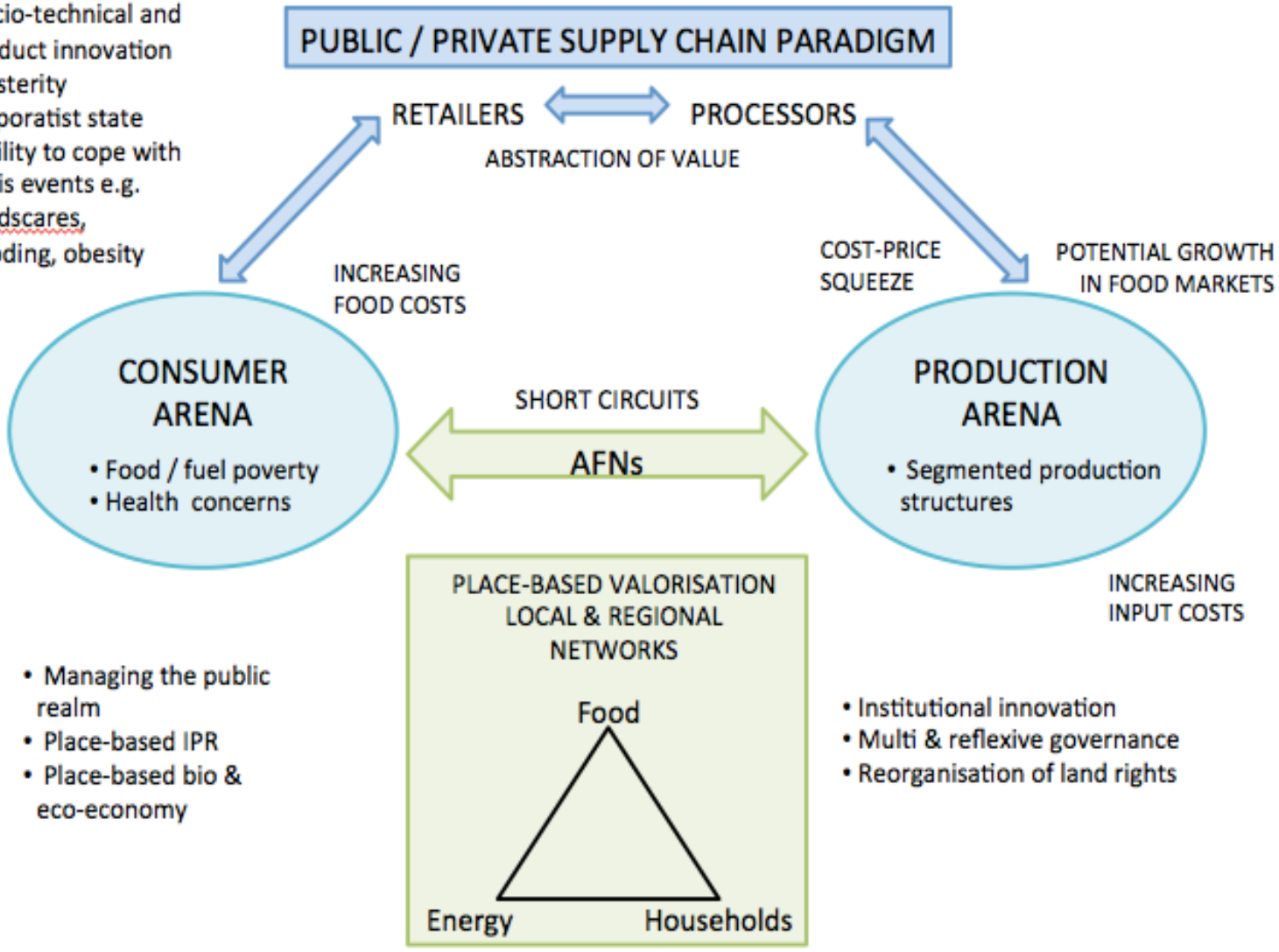
History moves from one conjucture to another rather than being and evolutionary flow. And what drives it forward is usually a crisis… Crises are moments of potential change, but the nature of their resolution is not given.

Neo-liberalism an explicit regulatory system : which has created: 1980s-2007 a particular hybrid public-private regulatory system (Marsden et al 2010) built upon financialisation and growth in food trade; the externalisation of risks to the South, and the proliferation of food 'choices' in the North. A spatial and ecological fix.

System Vulnerabilities Post 2007: from Transmango EU project

- **Ecological:** soil fertility, bio-diversity, production losses and declines in regional self sufficiency; water imports.
- **Social**: declines in health and well being; skill shortages on the farm and in the kitchen, rises in social inequality and low incomes; reductions in food sovereignty.
- **Corporate and financial:** oligopoly and power concentration; concentrated rather that distributed food infrastructures, unsustainable and unhealthy 'food choices and editing'; dependency upon imports and non-renewable; extended corporate dominance of land markets which constrain small holdings, horticulture and more public access to growing; weaknesses in public regulation regarding food safety.
- **Financialisation:** food treated as increasingly a financial tradable asset, to be traded and 'hedged' over time and space. Growth in financial packages by banks, agricultural trading firms, and investment funds. Creating more volatility and scarcity value which dives up food prices for households, and land and bio-sphere markets; and the end of the 'Engels Law'.

- Bioeconomy
- Socio-technical and product innovation
- Austerity corporatist state
- Ability to cope with crisis events e.g. foodscares, flooding, obesity



- Managing the public realm
- Place-based IPR
- Place-based bio & eco-economy

- Institutional innovation
- Multi & reflexive governance
- Reorganisation of land rights

COPING WITH FOOD DISORDER POST 2008

Corporate capture of the bio-economy

- European Crop and Protection Association

- ‘ A vision for the future of Europe-five steps to promote innovation, competitiveness and sustainable productivity ‘
- Build a science-based policy framework that balances risks and benefits
- Implement smarter and better regulation
- Ensure value-added consistency between EU policy and international agreements (e.g EU-US TTIP; EU-Canada (CETA) and trade in services deal (TiSA).
- Foster innovaton
- Mainstream agricultural productivity and competitiveness.

- I.e more of the same and business as usual in the age of the bio-economy.

Sustainable food paradigm

- 1. New food security and sustainability crisis with combined landscape pressures associated with climate change, resource depletion and health and welfare
- 2. Need critical understanding of how science, technology, industry, markets, culture and policy regimes are responding to these more fundamental problems
- 3. Developing an engaging sustainability science in developing a new food, energy, nature nexus paradigm

Box 1.1: Key parameters for defining sustainable systems

- Environment–economy integration: the eco-economy: ensuring that economic development and environmental efficiency and protection are integrated in planning and implementation.
- Futurity: an explicit concern about reducing the effects of unsustainability on the young and future generations.
- Environmental biodiversity protection and restoration: (a) environmental conservation: a recognised commitment where possible to protecting environmental resources and amenities; and (b) recognising environmental limits as a commitment to living within limits created by the 'carrying capacities' of the biosphere.
- Equity maximising, entropy minimising: a commitment to meeting at least the basic needs of the poor (relatively defined) of the present generation (as well as equity between generations).
- Quality of life and sustainable well-being: recognition that human well-being is constituted by a range of factors, including place-based abilities and capacities, and not just about income growth.
- Inclusive and multi-stakeholder capabilities and commitments for developmental and business models that are more than 'business as usual'; and ones that enhance the multiple territorial capitals of different places.

A new governance and regulatory terrain?

- Scientification of nature and the rise of the bio-economy.
- Towards ‘post normal’ science?

A wider sustainability science paradigm

- ‘In the case of science related complex policy issues-such as those related to sustainability challenges-where risks cannot be quantified, when damage is possibly irreversible, where values are in dispute, the stakes are high and decisions urgent, the application of routine techniques of normal applied science are not sufficient. In practice most science-related complex policy problems have more than one plausible answer, and many have no-well defined scientific answer at all. The aim is thus not about arriving or deriving a single truth, but rather the exploring and enactment of new tasks and practices for science concerning the wider application of knowledge production and decision-making processes.’
- Contested framings
- Co-production
- Integrating sustainable place-making with post-normal science.

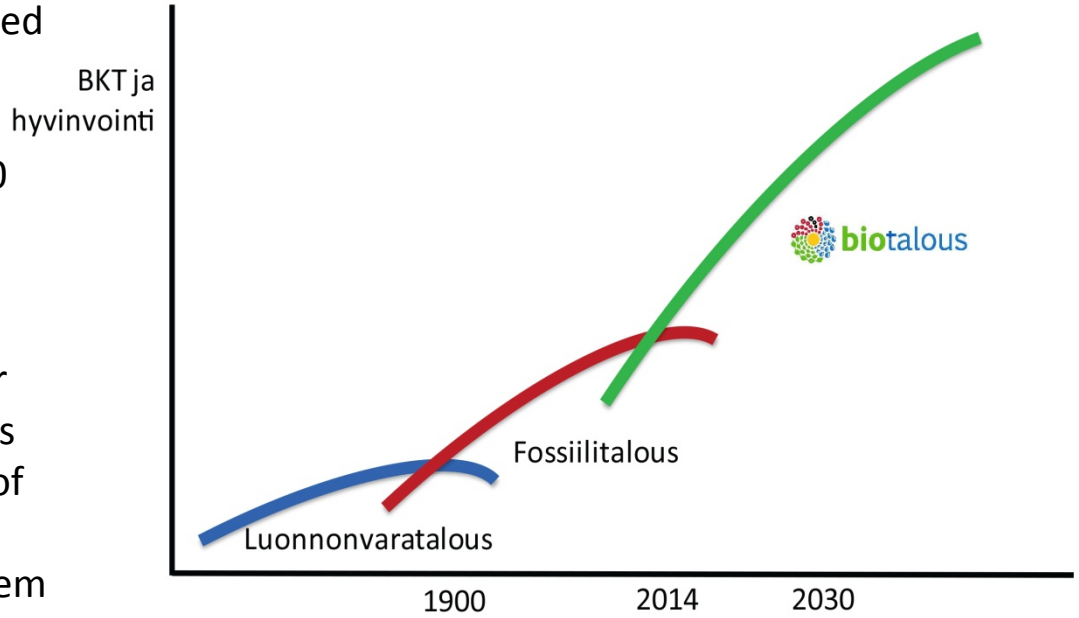
Defining the bioeconomy

- ‘That part of the economy which captures the latent value of biological processes and renewable bio-resources to produce improved health and sustainable growth and development.. An economy that uses renewable bio-resources and eco-industrial clusters to produce sustainable bio-products, jobs and income’ (OECD2011)
- By 2030 bio-technologies contributing 35% of outputs of chemicals (like bio-plastics); upto 80% pharmaceuticals and 50% agricultural outputs.
- ‘Spillover’ effects on energy, health and farming. EU turnover 2 trillion Euros;em]ploying 22 million and 9% of EU employment; exploiting the intersections between agriculture,forestry, fisheries, food, pulp, chemical and health and energy.
- Broader definitions of land and water-based eco-system services, including amenity; and rising significance of land rent from local provenance of products and services (Le Heron, Slee; 2012).

Bioeconomy is the next wave of economy

By the year 2030, the world's need for food will increase by 50 percent, need for energy by 45 percent and need of water by 30 percent.

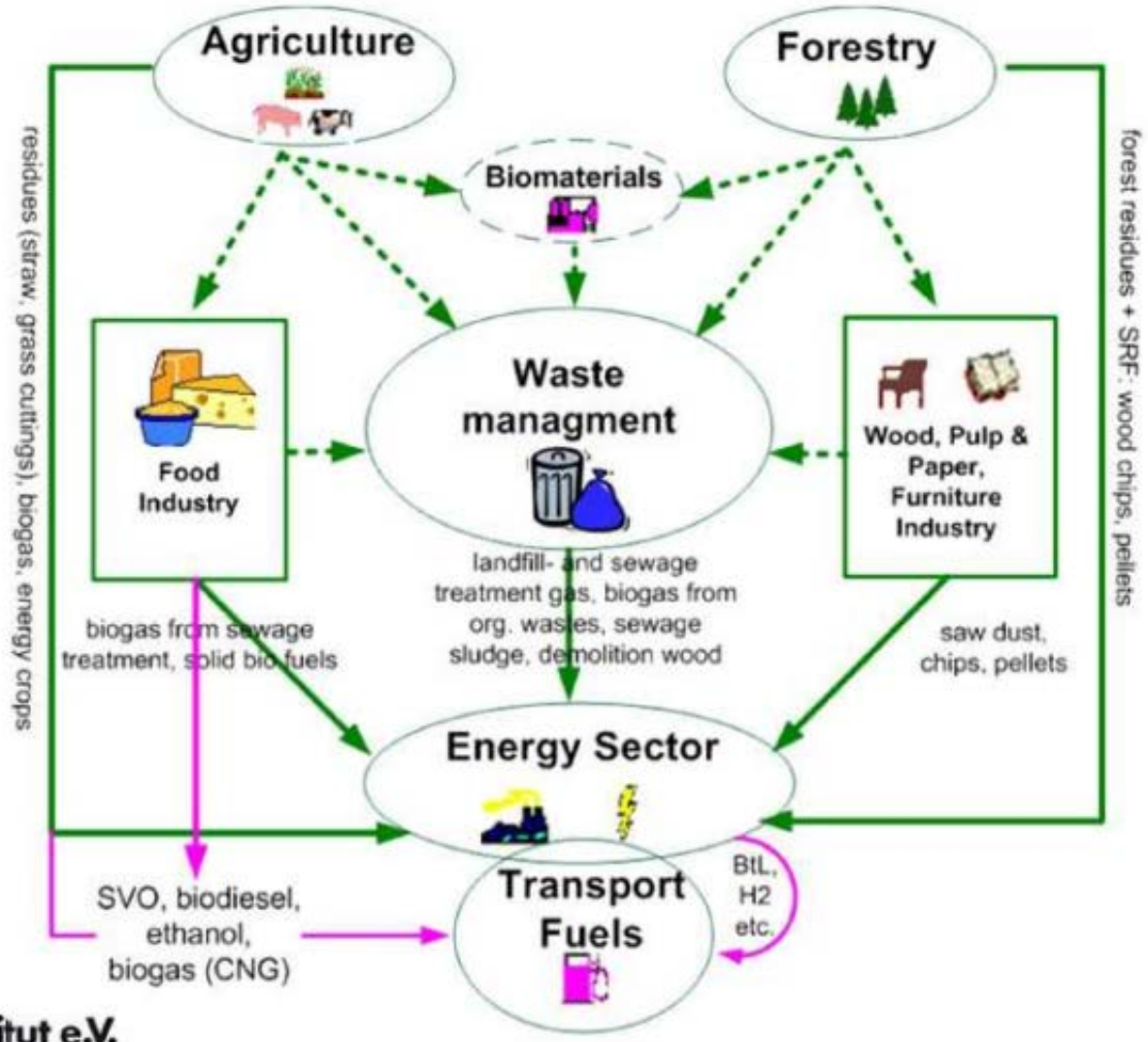
In bioeconomy, renewable resources will be used widely for producing food, energy, products and services. Efficient recycling of materials and securing the functionality of nature's ecosystem services are characteristic for bioeconomy. Bioeconomy decreases our dependence on the fossil natural resources.



*The most important renewable natural resources in Finland are the biomasses of forests, soils, fields, lakes and sea, as well as supplies of fresh water.

** Ecosystem services are ones provided by the nature, such as absorbing carbon dioxide and recreational use.

Consider all Biomass Flows



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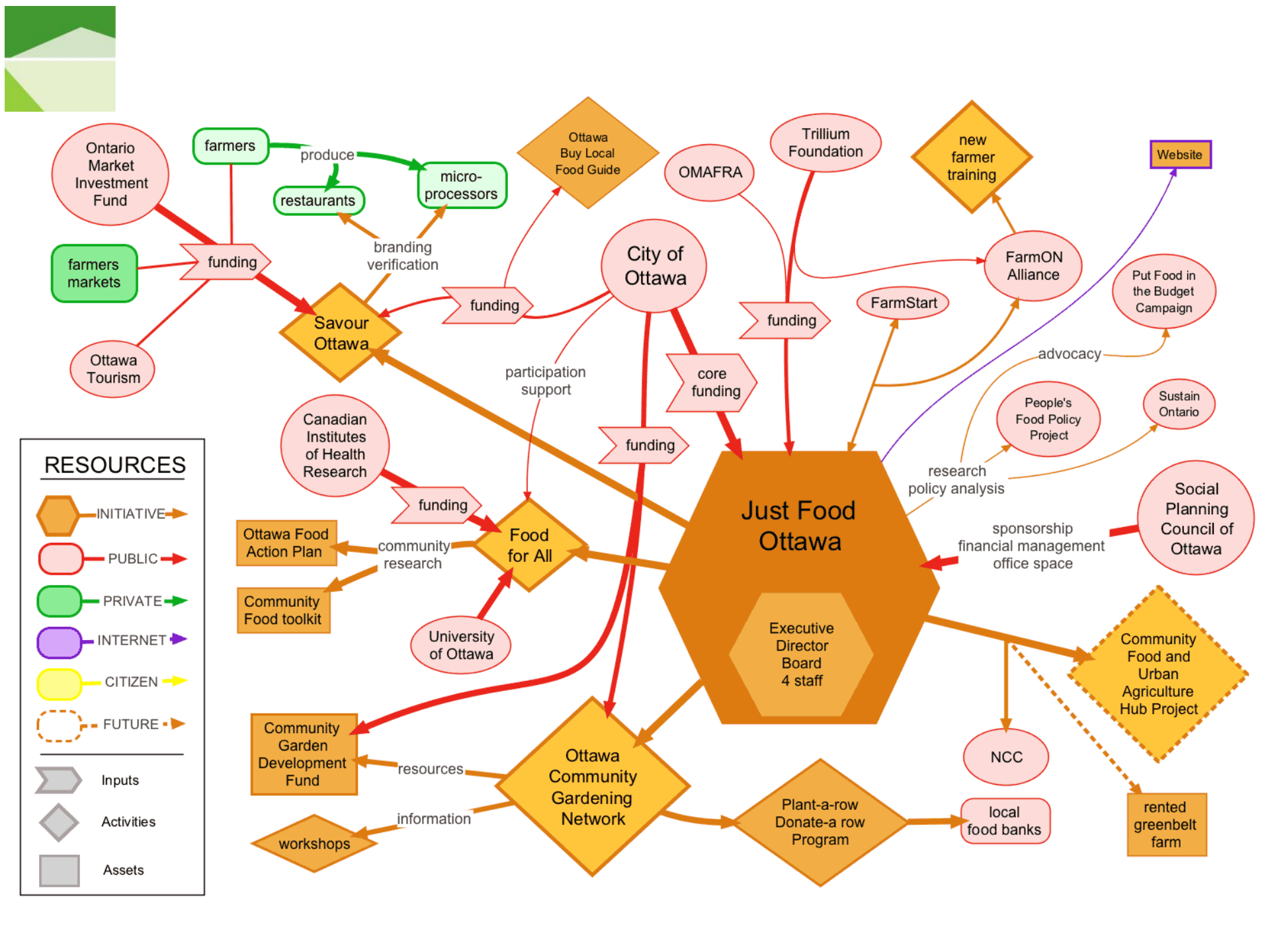

Ontario Market Investment Fund
farmers
produce
micro-processors
restaurants
branding verification
farmers markets
funding
Ottawa Tourism
Savour Ottawa
Ottawa Buy Local Food Guide
City of Ottawa
funding
participation support
OMAFRA
Trillium Foundation
new farmer training
Website
FarmON Alliance
FarmStart
funding
Put Food in the Budget Campaign
advocacy
core funding
funding
Canadian Institutes of Health Research
funding
Food for All
Ottawa Food Action Plan
community research
Community Food toolkit
University of Ottawa
Just Food Ottawa
Executive Director Board 4 staff
People's Food Policy Project
Sustain Ontario
research policy analysis
Social Planning Council of Ottawa
sponsorship financial management office space
Community Food and Urban Agriculture Hub Project
RESOURCES
INITIATIVE
PUBLIC
PRIVATE
INTERNET
CITIZEN
FUTURE
Inputs
Activities
Assets
Community Garden Development Fund
resources
Ottawa Community Gardening Network
information
workshops
Plant-a-row Donate-a row Program
NCC
local food banks
rented greenbelt farm

Competing or complementary bioeconomy arena?

- Agriculture and forestry: commodities and multifunctionalities.
- Bio-materials: plastics,chemicals,energy,bio-mass.
- Bio-services and eco-system services: amenity, health,open space,heritage water, bio-diversity.
- Eco-Economy: local,organic fair,ethical, producer-based rural development.

Land questions

- Different combinations of the bio-eco economy
- More diversity of land use and occupancy
- More diversified markets of rural land based goods and services.
- Need for closer management of land uses and occupancy
- Closer urban-rural linkages.
- Reintegrating production and consumption interests.

Key features of SPM

- Foundational economy: deep locality studies (Williams, CREW, 2014)
- Endogenous-exogenous equations and networks
- Innovations scaling out, in and under the nexus
- Engagement with multi-level and reflexive governance and scales: village neighbourhood, catchment, city region, bio-region, province…
- Enrolment of community into the active reappraisal of: assets, infrastructures, entrepreneurial networks, landscapes
- Evolutionary collaborative/collective informal planning and project development around place-based assets
- Re-working strategies with existing regulatory and institutional structures and creating new ‘spaces for action’
- Re-organisation of bio-sphere property rights
- Participation in translocalism agenda.

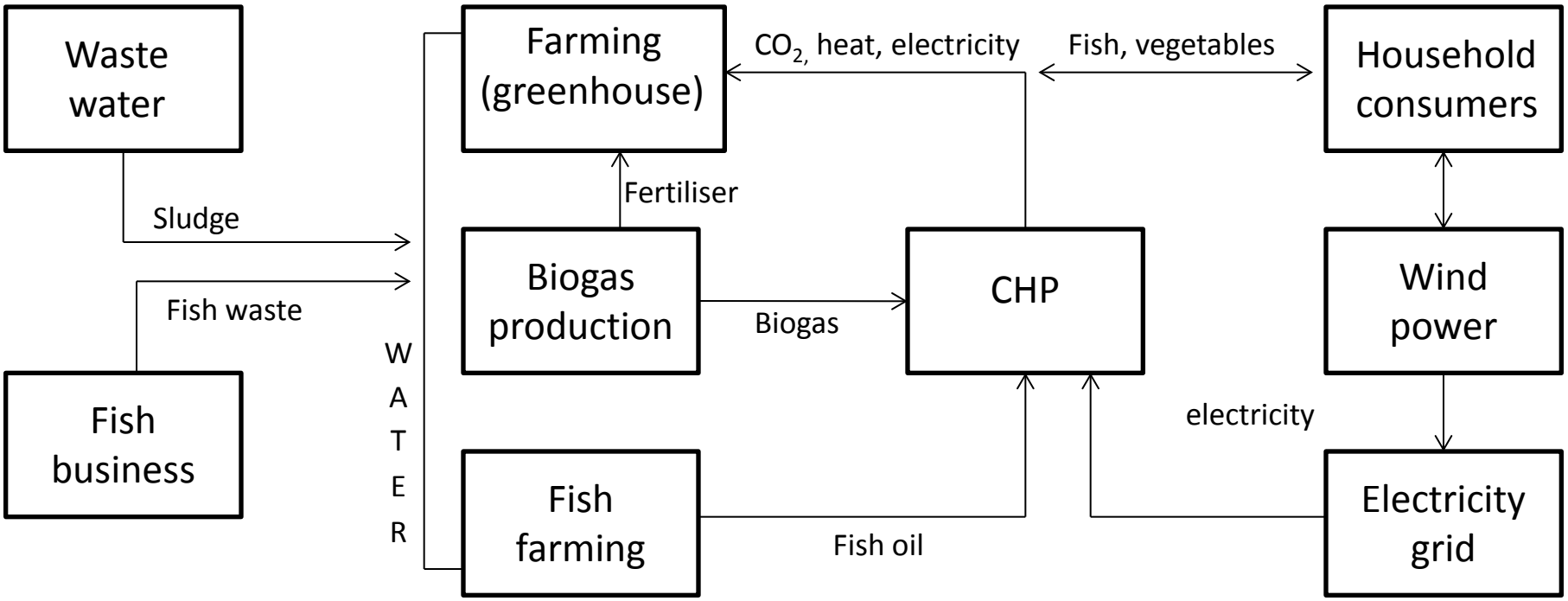
SPM processes

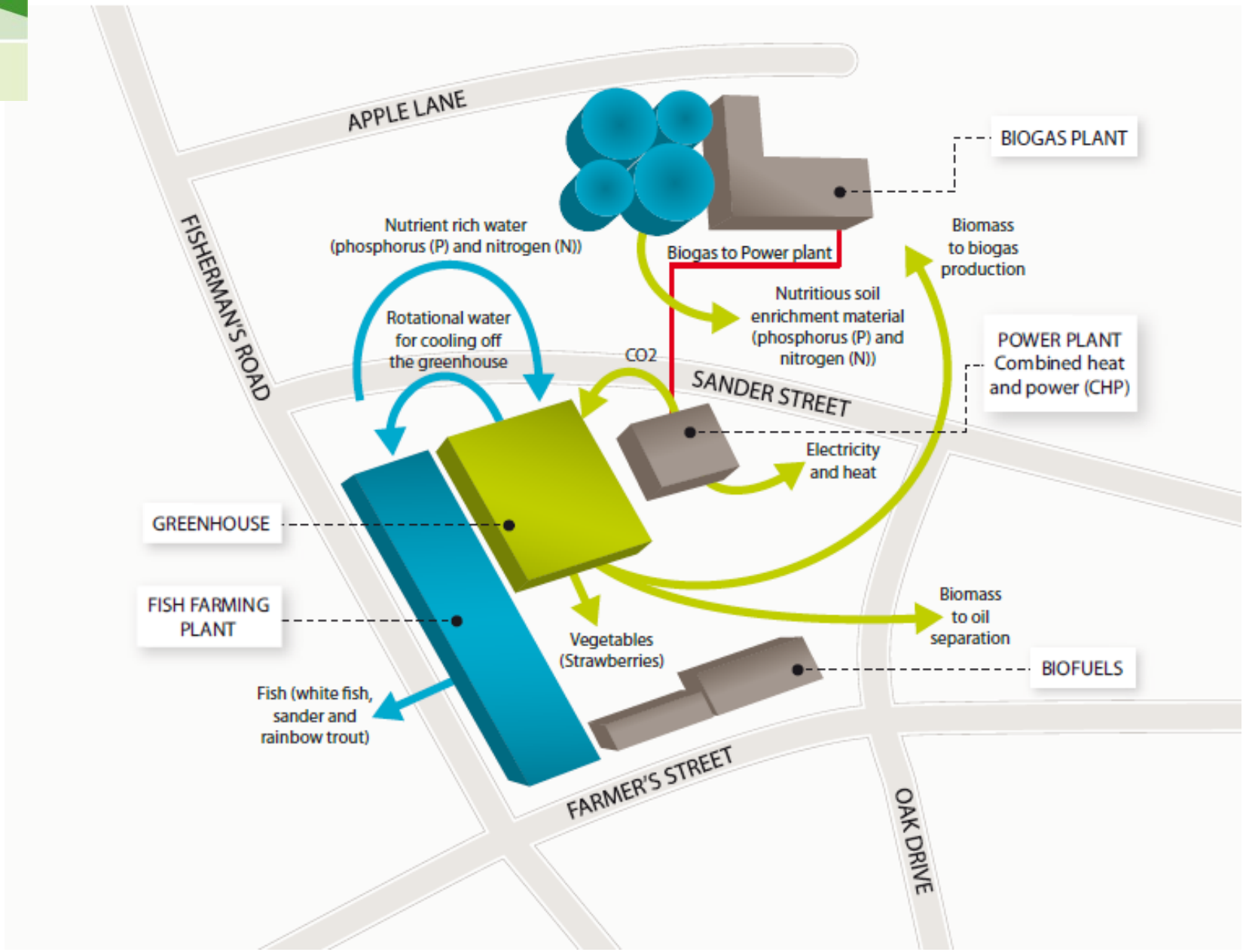
- Networked value creation rather than GVA/GDP squeeze
- A re-capturing of multiple flows of knowledge, goods and services
- Reflexive spatial governance
- A re-localisation of social assets, capitals and market practices
- A commitment to social as well as technical design, social innovation as well as new product innovation.
- A re-cognition of space as place
- Filling in the social and infrastructural ‘missing middle’ between individualised behaviours and aggregated abstractions.
- Nexus (food, energy, water, landscape) thinking turning into practices.
- Community based action research and capacity building

Shaping the eco-economy through financial re-engineering

- Creating regional accounts for sustainable development projects and initiatives (e.g Het Groene Woud, Netherlands).
- Shorter supply chains and networks.
- Local enterprise trading systems
- Time banking.
- Crowd funding.
- Community-based energy feed-in tariffs (e.g Germany)

A Bioeconomy Value Network





A biogas plant utilizes wastes of the local greenhouse and fish farming as well as other wastes to produce heat and electricity as well as fertilizers to local farmers and greenhouses

LOCAL MATERIAL CYCLE

- Basic needs, such as food and energy production
- Nutrients for bio-based production
- Biobased residues used as feedstock for other products
- Business based on closed loop value networks

GLOBAL MARKETS

- Goods produced through cenralised production systems
- Mineral based products and specialised bio-based products
- Special products only available in cartain locations
- Electricity and gas from global smart-grids
- Convertible local bio-economy concepts for global usage
- Global on-line services

In 2050, real time trading systems enable a glocal world economy

Conclusions

- Differing bio-economy/ eco-economy framings in regions and nation states.
- Forces of integration and fragmentation.
- Nexus and integrating value networks providing new , more distributed business models (e.g SITRA, Finland, Lund, Sweden).
- New linkages between biodiversity, consumer choices/access and health priorities

Conclusions 2

- The Distributed economy
- The deepened and broadened rural economy
- Translocal and as well as re-localised connections. e.g. Rural Alliances 76 community-business alliances/regional networks.
- Reflexive forms of multi-level governance: e.g procurement, fiscal and financial decentralisation, community co-production.
- Nexus business development.

Vulnerabilties in financialisation:The emergence of stranded assets in agri-food

- Stranded assets: ‘ unanticipated or premature write downs, devaluations or conversions to liablities’ (Caldecott et al, 2014).
- Caused by: one or a combination of :
- Environmental challenges (climate change, water constraints)
- Changing resource landscapes (e.g shale gas, phosphate)
- New government regulations (carbon pricing, air pollution regulation, planning and protected areas)
- Falling clean technology costs (solar PV, onshore/offshore wind/tidal)
- Evolving social norms and ethics and consumer behaviour
- Litigation and changing statutory interpretations (e.g changes in application of exisiting laws and legislation.
- Open source and cooperative knowledge sharing

Some warnings from the financial regulatory sector

- ‘As the world increasingly limits carbon emissions and moves to alternative energy sources, investment in fossil fuels will take a huge hit’ (Paul Fisher Deputy Head, Bank of England).
- ‘The vast majority of fossil fuels are unburnable’ (Mark Carney). (80% coal, 50% gas, 35% oil, with companies spending £436 billion in 2013 on searches).
- ‘When the credit bubble burst in 2018, the damage was devastating. We are making the same mistake today with climate change. We are starring down a climate bubble that poses enormous risks to both our environment and economy’. (Hank Poulson, former US Treasury Secretary).
- ‘Sooner rather than later, financial regulation must address the systemic risk associated with carbon-intensive activities in their economies’ (Jim Yong Kim, World Bank President).
- Norwegian sale of coal related investments from its Sovereign wealth fund affecting 122 companies ($8billion).

Stranded assets in Agri food- a new landscape

- Caldecott et al (2013)
- Environment-related risk factors are material and can strand assets throughout the agricultural supply chain. The amount of value potentially at risk if globally significant.
- The potential challenge of stranded assets in agriculture is currently being exacerbated by an ongoing agricultural boom, which is feeding off high commodity prices and poor investment returns elsewhere in the economy, to push farmland values to record highs in many markets.
- Understanding environment-related risks that can induce asset stranding can help investors, businesses and policy makers to develop effective risk-management strategies, which can improve resilience and minimise value risk.
- The regulation and diffusion of bio-tech/GM can drive further asset stranding by:
- Creating new or more vigorous pests and pathogens
- Exacerbating the effects of existing pests through hybridisation and related transgenic organisms
- Harm to non-target species, such as soil organisms, non-pest insects, birds and other fauna
- Disruption of biotic communities, including agro-eco-systems
- Irreparable loss or changes in species diversity or genetic diversity with species.

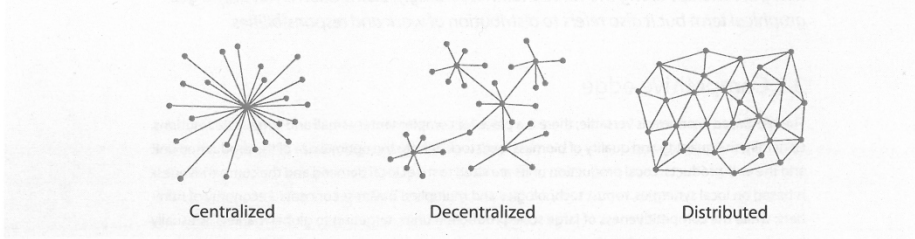
The Distributed Economy Model offers a possibility for more intensive utilization of local services. For example, energy for electricity and heating can be produced from local biomass. In case the local biomass stocks are more than sufficient, biomass or electricity and heat can be delivered also to neighbouring areas. In case of insufficient stocks, the energy needs can be fulfilled by the neighbouring areas.

3.2 Modularity and networks

The distributed bio-based economy is built on modular and multipliable concepts. The distributed units, the modular nodes, are the key components of the Distributed Business Models. Each module or production site is a node of its own, and is linked to several other nodes according to the needs and deliverables of each node. Each node is highly valuable for the other nodes.

The distributed bio-based economy is built on modular and multipliable concepts.

Information and communication technologies create new possibilities for virtual communities and virtual business processes, on which distributed modular business concepts can be built on. The information and knowledge networks can be utilized to connect single distributed units to each other in order to optimize efficient use of resources.

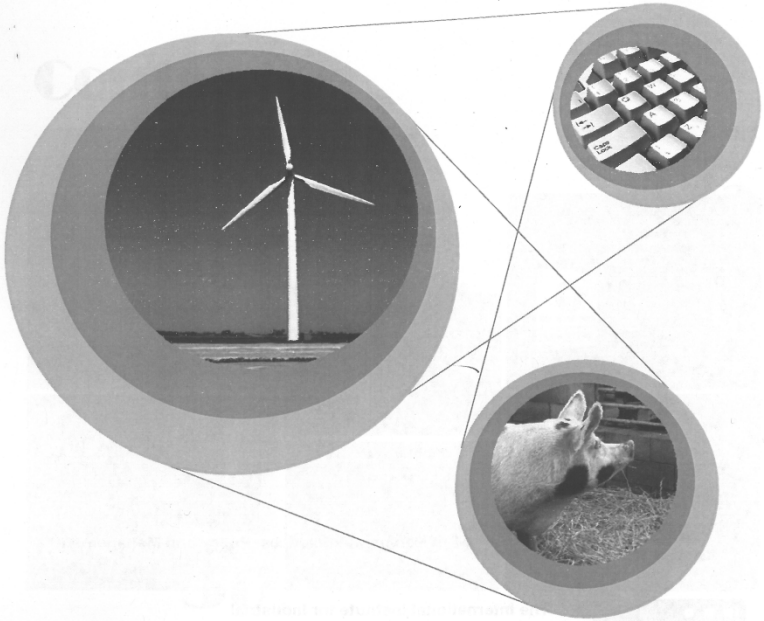


Picture 5: *In a Distributed Business Model each module or production site is a node of its own, and it is linked to several other nodes according to the needs and deliverables of each node (Van den Dool A. et al 2009).*

Especially in bio-based energy production, where local feedstock plays an important role, small-scale energy production units will become popular. Although the production takes place in the origin of feedstock, electricity and fuels can still be produced regionally, multi-regionally or even globally thanks to global wide super grids of electricity and gas networks.

In the energy market, distributed power units can be linked together through common administration and ownership as well as smart power grids to create virtual power plants. The same analogue can be utilized in the various concepts of the distributed bio-based economy. A number of distributed bio-based production units all over the world can be adaptively controlled taking into account local and global market needs in real time or in advance.

Although the nodes create the base of distributed business models, competences can cluster together and form geographical or substantial hubs. The hubs connect the global producer and user networks and ensure efficient production methods. Just-in-time production and flexible outsourc-



The Future Is Distributed

A Vision of Sustainable Economies

iiiee The International Institute for Industrial Environmental Economics at Lund University

Towards the (post-neo-liberal) eco-economy.

Enact distributed spatial development: quadruple helix: reflexive design with science, policy, community, business.

Create and join up new translocal and regional food and energy supply networks.

Create innovative platforms for ‘post normal’ sustainability science and sustainable place-making.

Progress Eco-economic and circular economy models (across ‘regenerative’ cities and regions) which embrace a more distributed bio-economy, giving priority to social and ecological objectives and adaptive structures.

Build new infrastructures, including new financial ecologies , food/energy/tourism hubs using digital media.

Embed and translate these into more reflexive multi-level governance frameworks.