

Globalization, China and the New Zealand Dairy Assemblage

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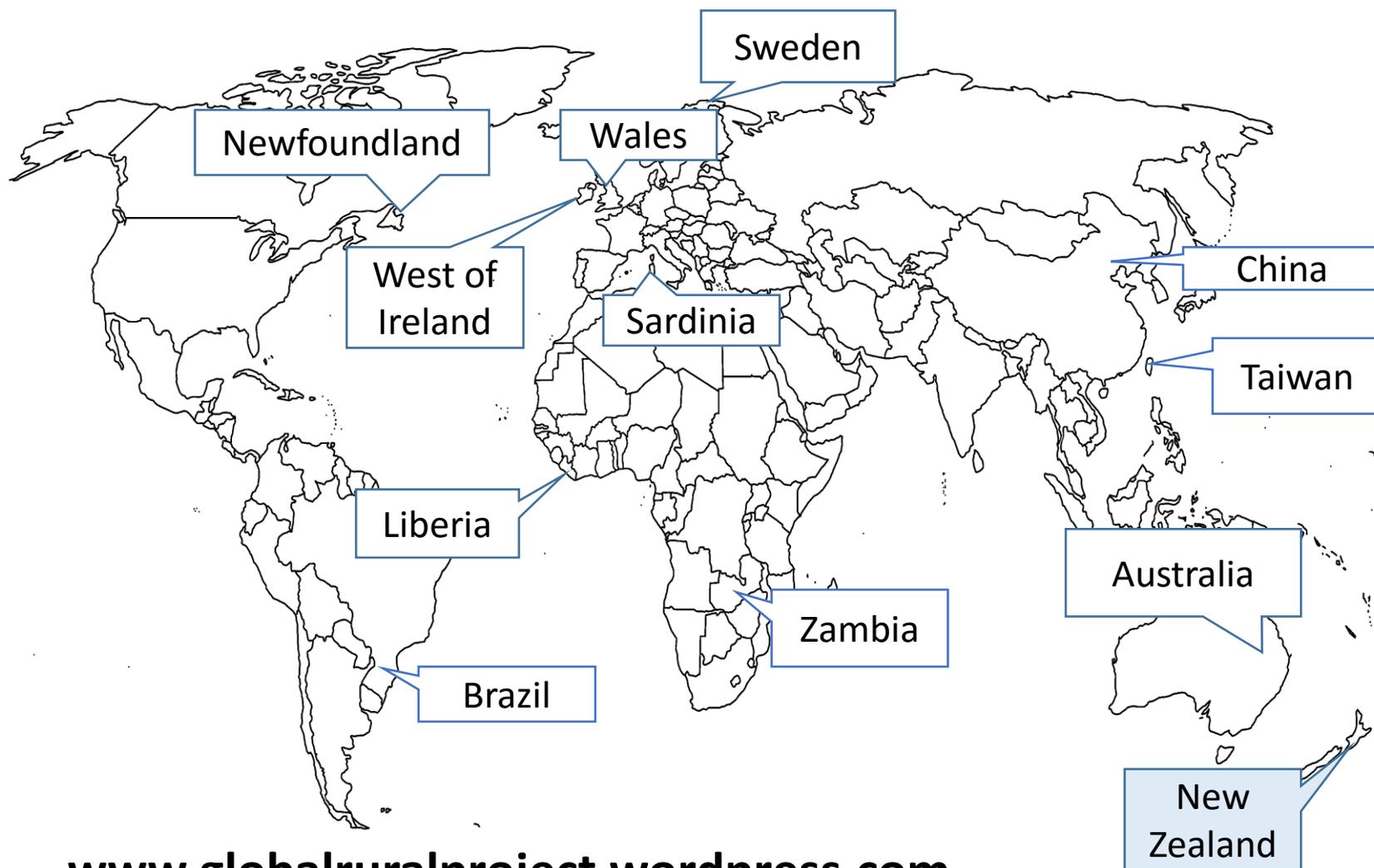
Rethinking Globalization

- Globalization not as a top-down and homogenizing force
- Globalization as inter-connectivity and inter-dependence, (re-)produced through localities
- Agricultural globalization as the engagement of farming systems in transnational networks and relations that are reproduced at the farm level and which impact of wider rural societies and environments
- Focus on how global connections are made and re-made through micro-scale processes



GLOBAL-RURAL

5-year ERC Advanced Grant project,
2014-2019



www.globalruralproject.wordpress.com

New Zealand and the Global Economy

- Rural New Zealand ‘created’ through global encounters with Pacific Maori and European settlers
- Agricultural economy based on commodity exports to Britain (lamb, wool, butter)
- Facilitated by transnational circulation of people, capital, livestock and technologies (e.g. refrigeration, modified Cocksfoot grass seed)



New Zealand and the Global Economy

- British market closed by UK entry to European Economic Community in 1973
- Search for new export markets for New Zealand produce
- Substantial restructuring of New Zealand agriculture to make it competitive in a global market
- Underpinned by 'globalization discourse' (Larner, 1998)



Agricultural Restructuring



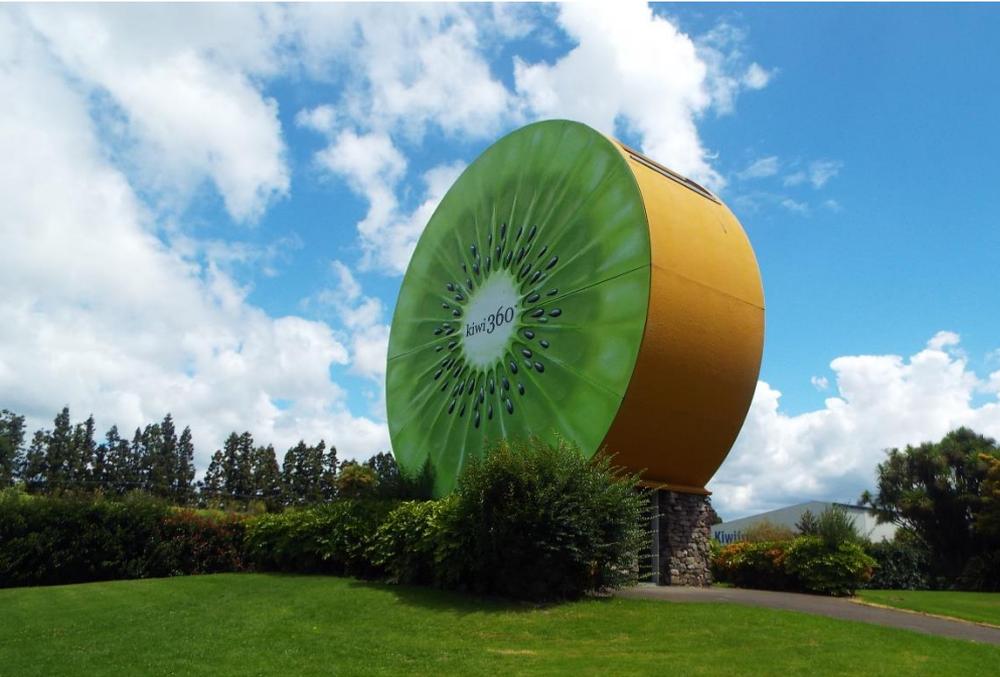
Deregulation 1984

Larger farm sizes

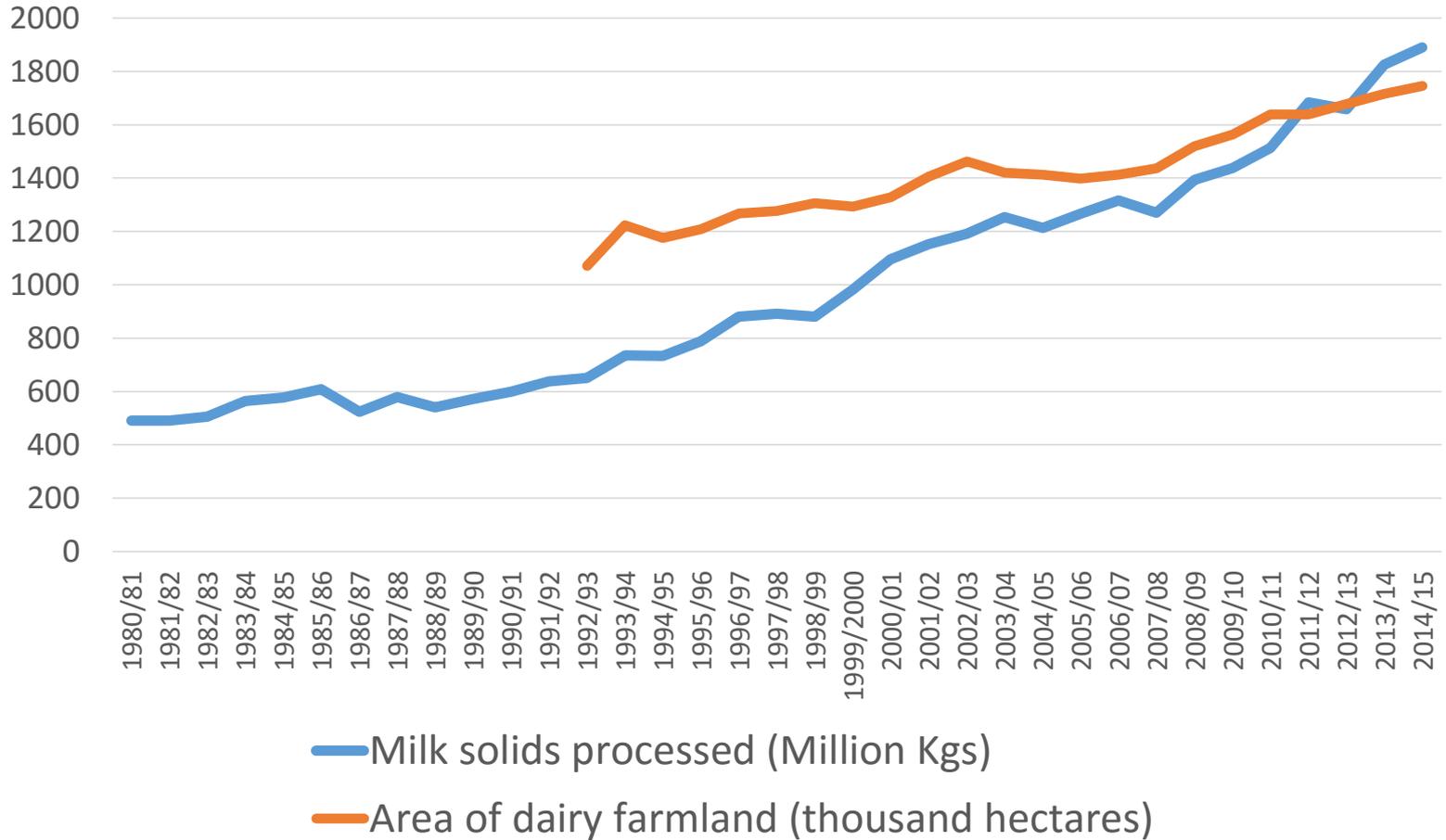
More intensive farming

More corporate farming

Diversification

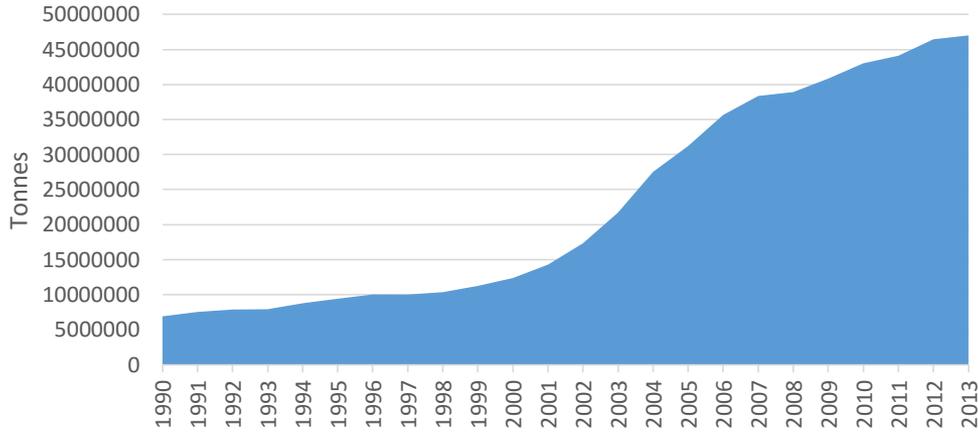


Expansion of New Zealand Dairy Industry



Source: DairyNZ

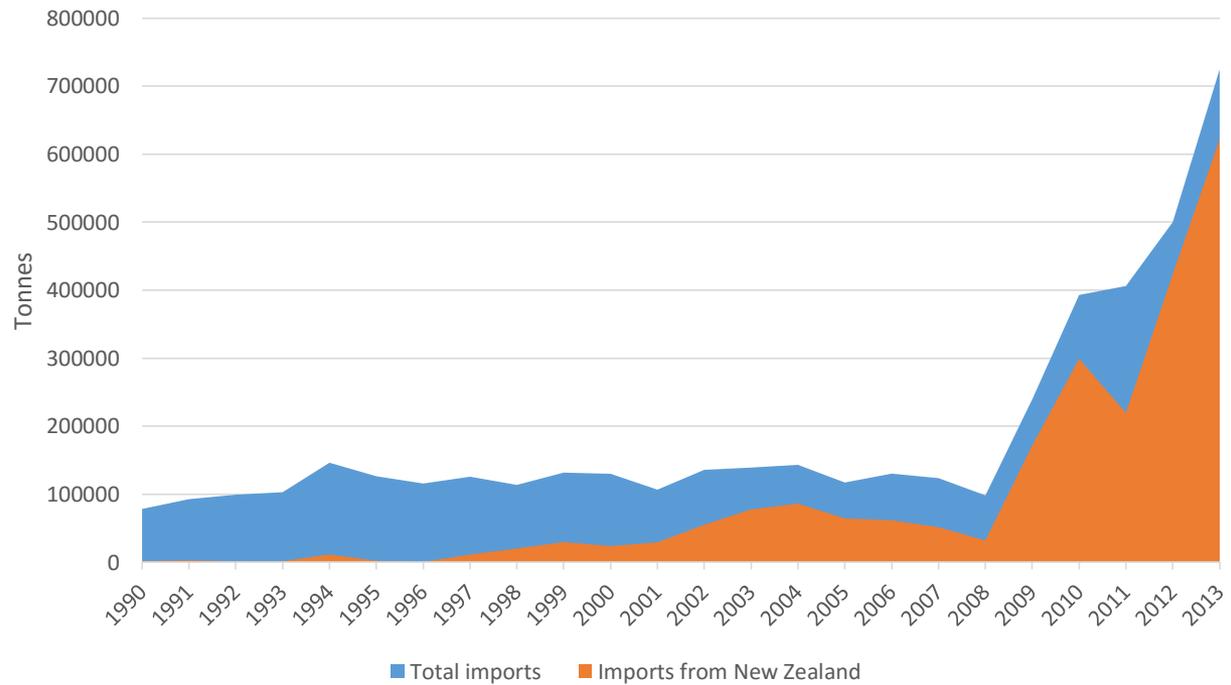
Total supply of milk products in China (excluding butter)



Increasing demand for milk and dairy products in China

New Zealand as leading exporter of milk powder to China

Imports of whole milk powder to China



Source: FAOStats

An Assemblage Approach

- The assemblage approach emphasizes emergence, multiplicity and indeterminacy, viewing the world as comprised by dynamic collections or entanglements of diverse heterogeneous components
- Informed by Sociology of Science and Technology, but also post-structuralist social theory
- Variants derived from work by Bruno Latour, Gilles Deleuze & Felix Guattari, Michel Foucault, Manuel DeLanda
- Provides way of examining how structures or systems are put together (assembled) and how they change over time

The farm as an assemblage

- 1) Comprised by *heterogeneous components* – human and non-human, organic and inorganic



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- 2) The components and their arrangement are *dynamic and constantly changing*



The farm as an assemblage

- 1) Comprised by *heterogeneous components* – human and non-human, organic and inorganic
- 2) The components and their arrangement are *dynamic and constantly changing*
- 3) *Agency is dispersed* among the components, human and non-human



The farm as an assemblage

- 4) The components have both *material* and *expressive functions*



The farm as an assemblage

- 4) The components have both *material and expressive functions*
- 5) The assemblage is given shape by processes of *territorialization* (spatial and organizational)



The farm as an assemblage

- 4) The components have both *material and expressive functions*
- 5) The assemblage is given shape by processes of *territorialization* (spatial and organizational)
- 6) The assemblage and its components are made meaningful through *coding*



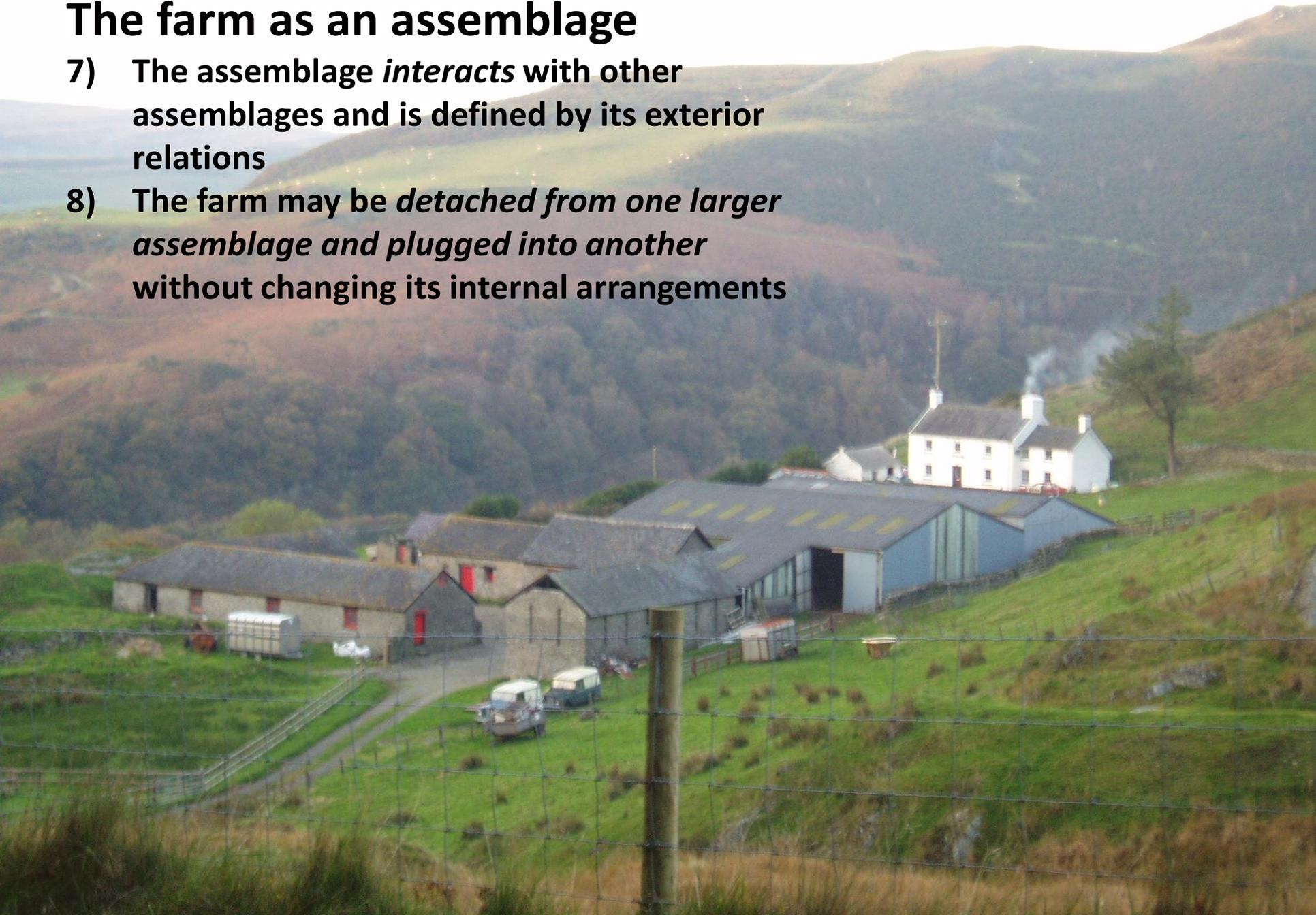
The farm as an assemblage

- 7) The assemblage *interacts* with other assemblages and is defined by its exterior relations



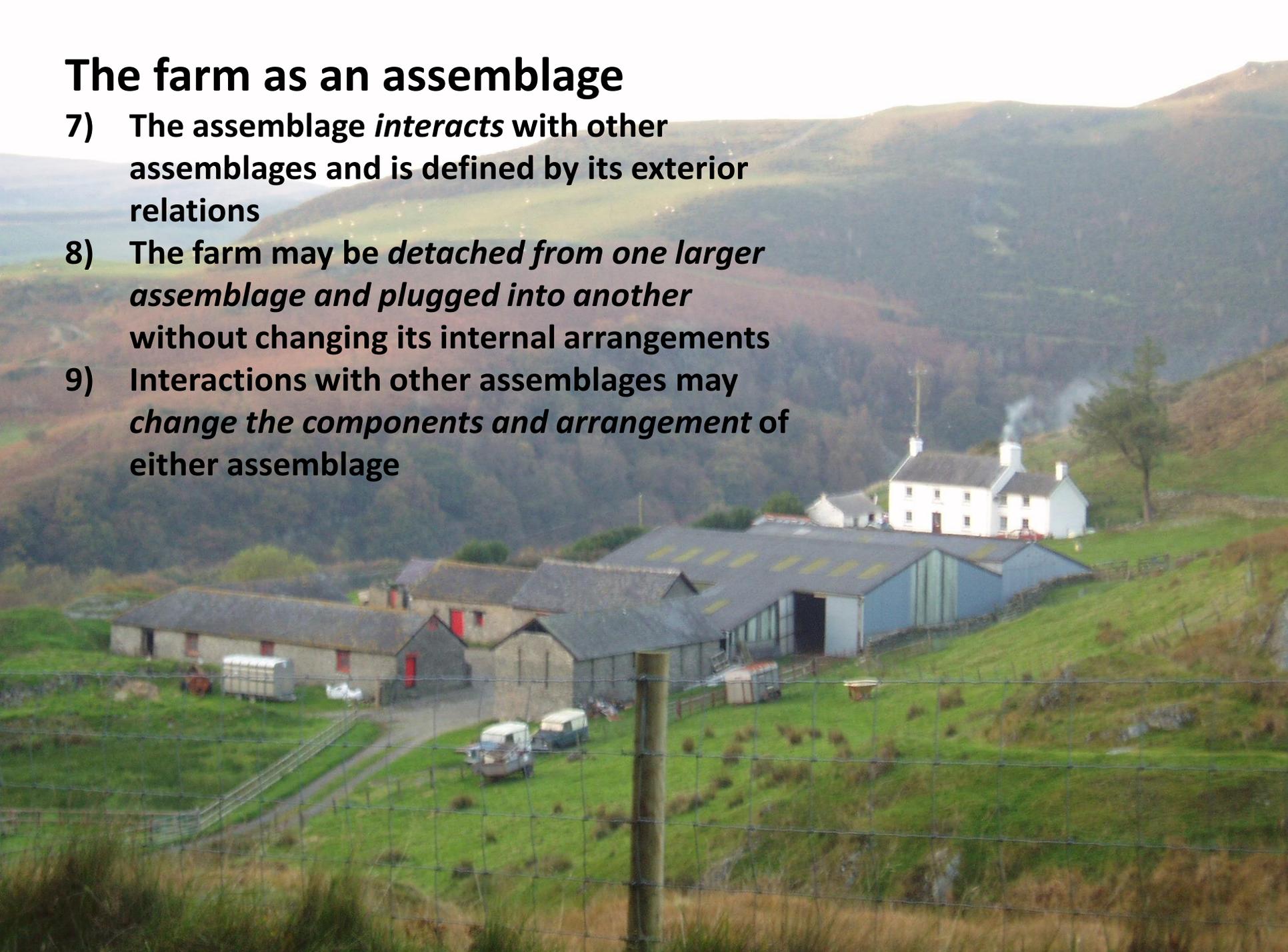
The farm as an assemblage

- 7) The assemblage *interacts* with other assemblages and is defined by its exterior relations
- 8) The farm may be *detached from one larger assemblage and plugged into another* without changing its internal arrangements



The farm as an assemblage

- 7) The assemblage *interacts* with other assemblages and is defined by its exterior relations
- 8) The farm may be *detached from one larger assemblage and plugged into another* without changing its internal arrangements
- 9) Interactions with other assemblages may *change the components and arrangement* of either assemblage



Applying Assemblage

- How trade in milk powder with China was assembled (the 'NZ-China dairy-export assemblage')
- How farms were re-assembled (through dairy conversions) to attach themselves to the NZ-China dairy-export assemblage
- How changes in farm-assemblages have impacted on other assemblages (rural communities, rural ecosystems) with which they interact
- How these assemblages respond dynamically to fluctuations in the Chinese market

Assembling NZ-China Trade

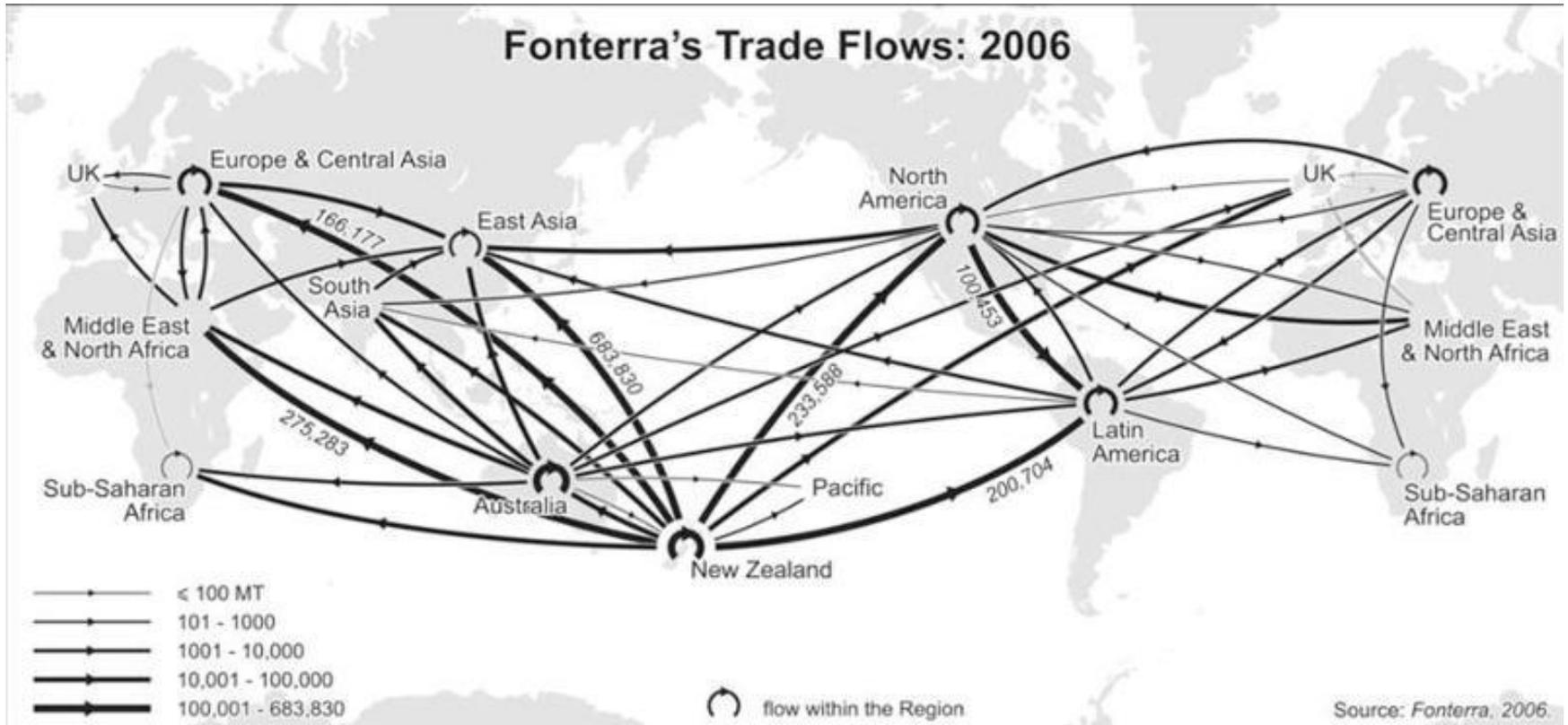
- Strategic re-territorialisation of NZ dairy export assemblage following exclusion from UK market
- Geographically – identification of new markets in Asia and Latin America
- Organizationally – with restructuring of dairy industry and formation of Fonterra, but also development of operations overseas
- “It was no longer enough... to set out from New Zealand with something to sell; the [Dairy] Board must establish bases in the world’s markets and become directly involved. It must become a major player in the business” Yerex (1989) *Empire of the Dairy Farmers*



Trade flows of New Zealand Dairy Board 1972

Source: Gray and Le Heron (2010) in *New Zealand Geographer*

Fonterra's Trade Flows: 2006



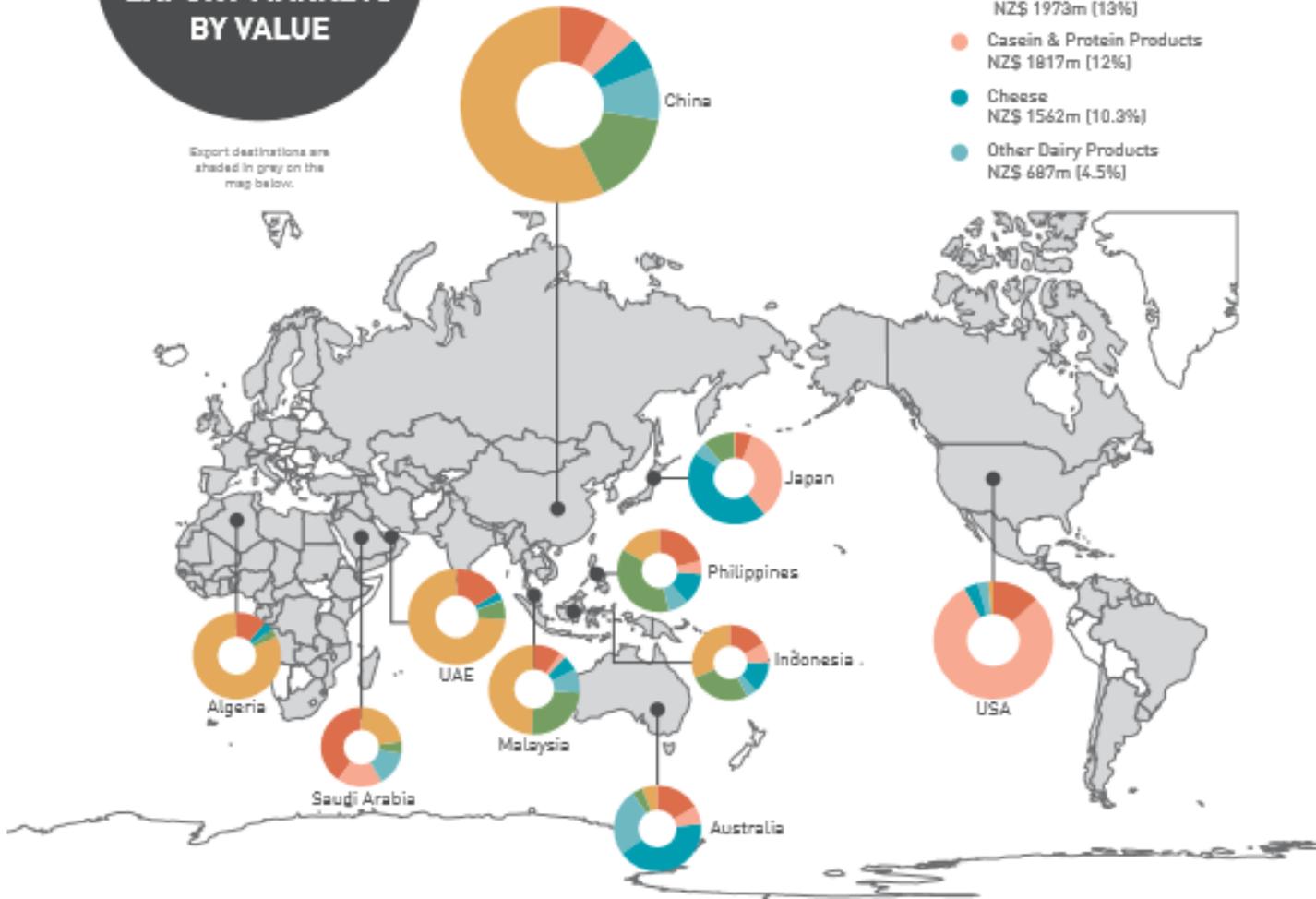
Trade flows of Fonterra (successor to NZDB) 2006

Source: Gray and Le Heron (2010) in *New Zealand Geographer*

TOP 10 DAIRY EXPORT MARKETS BY VALUE

Export destinations are shaded in gray on the map below.

- Whole Milk Powder NZ\$ 6077m (40.2%)
- Butter, AMF & Cream Products NZ\$ 2396m (15.8%)
- Skim milk Powder, Buttermilk Powder and Infant Foods NZ\$ 1973m (13%)
- Casein & Protein Products NZ\$ 1817m (12%)
- Cheese NZ\$ 1562m (10.3%)
- Other Dairy Products NZ\$ 687m (4.5%)



New Zealand Dairy Exports 2014

Source: NZMPI (2015) *Situation and Outlook for Primary Industries 2015*.

Assembling NZ-China Trade

Modifying the composition of the dairy export assemblage

- Replacing butter with milk powder as the core commodity
- Construction of milk powder processing plants
- R&D investment to improve techniques
- Attention to different methods for reconstituting milk powder in different markets
- Enrolling Royal Inter-Ocean Line to establish shipping route from NZ to China



Milk powder plant,
Longburn, built 1965



Assembling NZ-China Trade

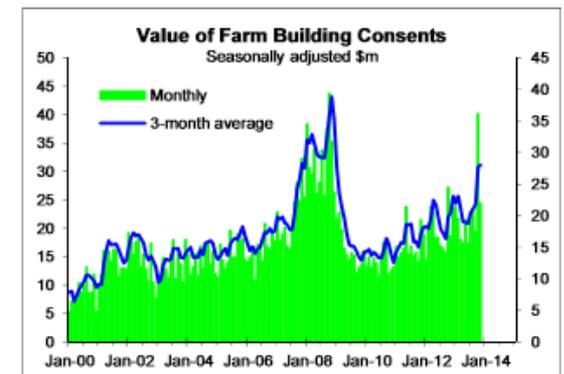
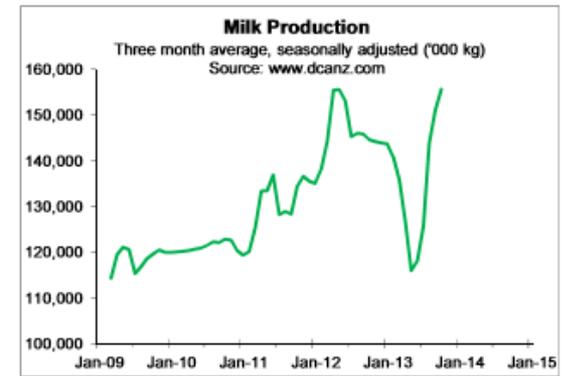
- Sanlu food contamination scandal in China 2008
- Milk powder and infant formula adulterated with melamine
- New Zealand milk powder considered safe
- Coding of New Zealand products in China as 'pure'
- Expressive function of NZ milk powder

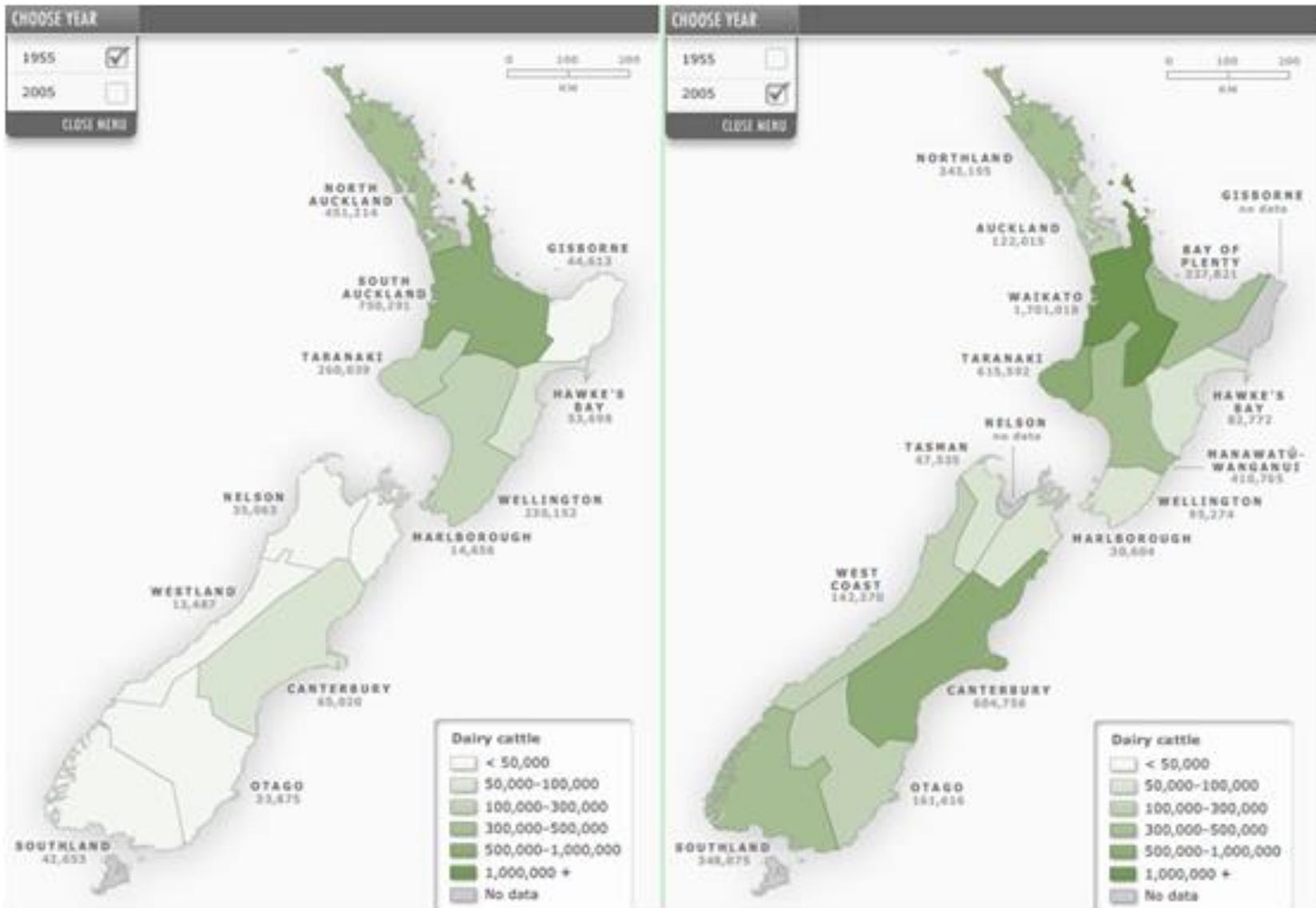


Assembling NZ-China Trade

- Increased demand for milk from NZ farmers
- Increased prices for milk (coding of milk in commodity markets)
- Conversion of sheep and beef farms and forest land to dairy

Graphs from Dickens (2014) *Insights into the dairy export boom and some interesting implications*





Numbers of dairy cattle in New Zealand, 1955 (left) and 2005 (right)

Re-assembling the farm

Dairy conversion involves re-assembling the components of the farm

- Dairy cattle breeds replacing beef cattle and sheep
- New buildings, e.g. milking sheds
- Irrigation systems
- Purchase of feed supplements and/or planting of crops for silage
- Additional labour requirements

Many of these new components are sourced from outside New Zealand

Re-assembling the farm

- Maize planted as a silage crop
- Hybrid seeds developed by US-based biotech firms DuPont and Corson
- Signs mark the landscape of the global countryside with the proprietary knowledge claims of transnational corporations



Germany



Belgium

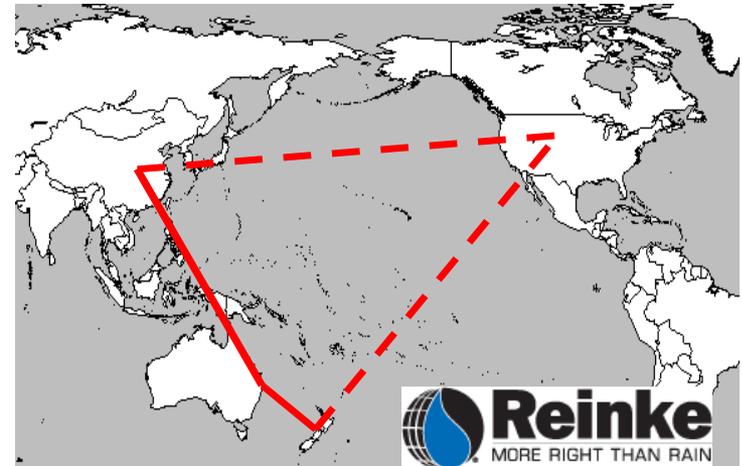


DuPont's Pioneer maize in Manawatu, New Zealand



Re-assembling the farm

- Irrigation systems required for higher water demand of dairy farming
- Popular Centre Pivot Irrigation system manufacturers Valley, Rainer and Reinke all based in Nebraska, US
- Reinke irrigation systems manufactured in China & exported to NZ via warehouse in Brisbane, Australia



Re-assembling the farm

- Re-assembling the farm for dairy conversion also required capital, drawing on domestic and international sources
- Borrowing from (foreign-owned) banks
- Private investment by NZ individuals, including farmers
- Farms bought by international buyers for dairy conversion

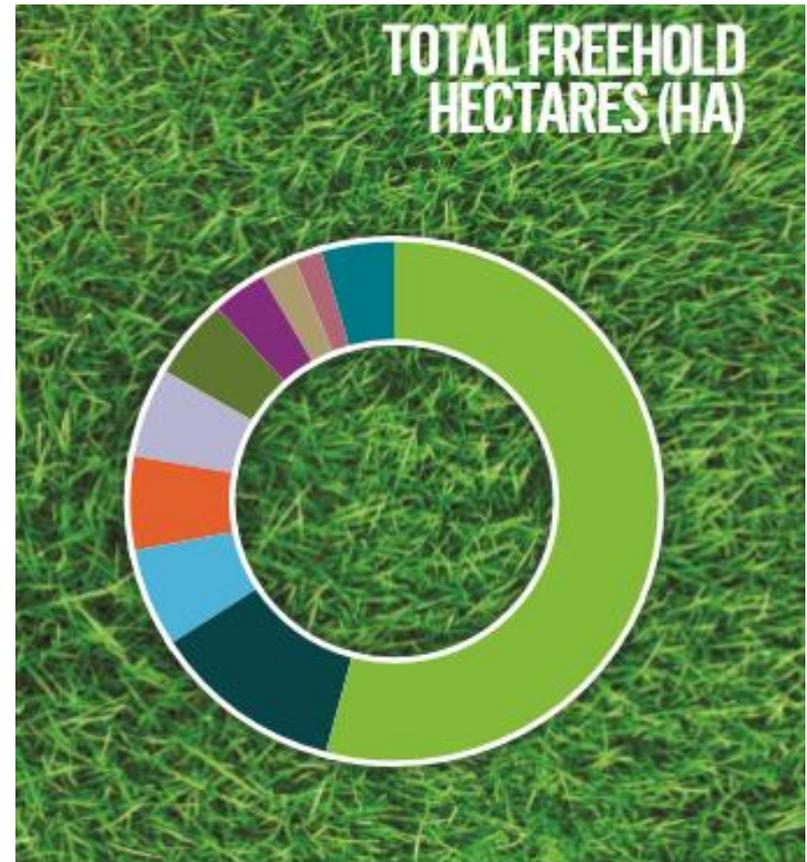


Re-assembling the farm

57 dairy farms with 28,312 hectares sold to foreign buyers in 2013 and 2014

54% to US buyers, 12% to Chinese buyers

Source: KPMG (2015) *Overseas Investment in New Zealand's Dairy Land*



United States (54.4%)
China (11.7%)
Sweden (5.9%)
New Zealand (5.9%)
Various Overseas (5.5%)
United Kingdom (5.0%)
Canada (3.4%)
Switzerland (2.3%)
Italy (1.5%)
Other (1.4%)

Source: ORO approvals for the period January 2013 to December 2014

Rural Impacts

- Farms are components in wider assemblages of rural communities and the rural environment
- An assemblage approach helps to reveal how globalization-led dairy conversions impact on these related assemblages
- Dairying's draw on water resources and discharge of effluent and chemicals as changing the composition of aquatic assemblages with which it interacts



Rural Impacts

- Also expressive functions of farming and farmland in rural landscapes
- Dairy conversions opposed for changing the appearance of the landscape

“I feel it would be a catastrophe to see the Mackenzie Basin as green pasture land with herds of dairy cows grazing across the vista with a mountain backdrop. The reason I go to the Mackenzie is to see the different landscape; the barren yet beautiful tussockland is unsurpassed.”

Letter to *Timaru Herald*, 4 June 2009

“Even the colours are changing, the mosaic of tawny wheatfields and sheep country now broken by interloper greens and a more diverse palette of crops.”

New Zealand Geographic, 2010



Mackenzie Basin,
South Island, NZ

Rural Impacts

Re-territorialization of rural communities, as new components are introduced and pressure places on existing arrangements and coding.

- New Asian migrant populations – helping to support community services, revitalise churches etc
- New requirements for professional services (e.g. vets)
- Increased traffic on rural roads from milk tankers (increased cost for road maintenance) and increased electricity demands (for irrigation systems)



Dynamic Assemblages

- Principle of assemblage approach is that assemblages are always contingent and dynamic
- Attachment to new global markets has produced economic benefits for NZ dairy industry, but has also introduced new vulnerabilities
- Exposure to effects of small changes in Chinese market, re-territorialisation of the global dairy assemblage, re-coding of the value of milk on world markets

Dynamic Assemblages

www.manawatustandard.co.nz
ManawatuStandard

MANAWATU STANDARD — 24 DEC 2014
Edition 1, Page 9

China boom turning down

‘Perfect storm’ of:

- Reduced demand from China due to over-stocking of milk powder in 2014
- Closure of Russian market due to sanctions
- Increased dairy production in EU following end of milk quotas

Dynamic Assemblages

NZ farmers responding with changes in the territorialisation and coding of the dairy assemblage in New Zealand

- Making changes to the components of the farm:

“I think next year is just going to be shocking ... when we got to this year of course we had a big rehash of the budget and **we cut a whole lot of things out**. Umm, we cut cost feeding this year and this type of thing you know. **We haven't bought in any maize this year. We've bought no barley** because we only buy barley when we can, we just grew it ourselves and we just can't afford to do it. Umm, what else are we cutting out? Umm, we bought on barley and we're buying no maize so I grow all the maize I need but it won't compensate for that amount of feed. In going to next year is all very well 'cause going to **next year we'll make no silage, because we'll have no barley for it**. And I just don't know where the centre line is. I don't know say, I reckon the next thing will be reduction in um, um, a big reduction in er, um, cows. Yeah, we reduced our cow numbers quite a lot last year and um, yeah so this year um, we're going to have to ... yeah so um, we'll reduce probably another , **we might reduce our cow numbers by up to 100.**”

Manawatu dairy farmer (Interview, Feb 2016)

Dynamic Assemblages

- Seeking to detach from existing customers and attach to new assemblages
 - Farmers quitting Fonterra for competitor companies offer better deals or trading in niche products (e.g. Open Country)
 - Contracts directly with Chinese companies now building their own milk processing plants in New Zealand



Yashily plant at Pokeno

Dynamic Assemblages

- Attaching to the liquid milk market in Asia

Fonterra Waitoa UHT

In April 2014, the first 25,000 Anchor UHT cream packs ready for export came off the line at Fonterra's new UHT site in Waitoa. The site has since been commercially producing fortified milk and cream products destined for the growing markets of China and wider Asia.

The scope of the site is \$126 million facility for a total of more than 80 permanent staff and the capacity to process an estimated 300 million litres of milk each year.

The site started construction in March 2013 and has come together successfully thanks to more than 1,200 staff and contractors, over 275,000 man hours – all in less than 18 months.

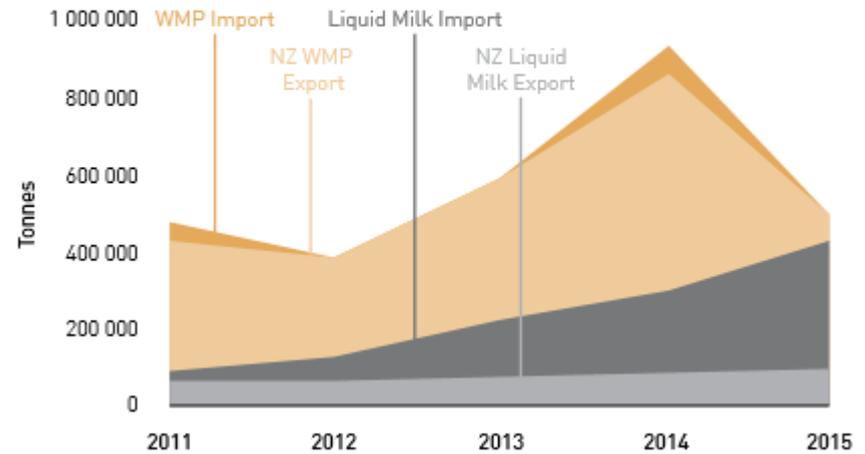
QUICK FACTS

- 80 employees
- Waitoa UHT can pack 34 containers per day – these are shipped to China, Hong Kong, Malaysia, Taiwan ROC and more recently, Guatemala.
- The UHT Site is more than 300 metres long.
- When all four lines are running at full capacity, the site can produce 28 UHT packs per second.

CONTACT DETAILS

Address: Cnr Mt Road & SH16, Waitoa 3341, Waikato, New Zealand
Phone: +64 07 838 7302

Figure 6: Trends in dairy product mix with key Asian markets



Source: *Situation and Outlook for Primary Industries, December 2015 Update*

Fonterra's new UHT plant supplying China, Hong Kong, Malaysia, Taiwan and Guatemala



Dynamic Assemblages

- Deterritorialization (1)
- Dairy farmers selling up



Dynamic Assemblages

- Deterritorialization (2)
- The off-shoring of NZ dairying
- Cows exported to establish dairy herds in China
- Fonterra operating farms and processing plants in China
- NZ farmers establishing farms in Chile and Uruguay
- What do we mean by 'New Zealand dairy industry?'

Huge load of dairy cows off to China

A bit of Taranaki takes root in South America

Chile 'land of opportunity' for keen NZ sharemilkers



Summary

- Globalization as an iterative process of ongoing dynamic interactions between the local and the distant
- Global commodity chains and new markets are actively assembled through situated actions and micro-scale modifications
- Transnational connections can open new opportunities for farmers, but are achieved through farm-level changes that in turn impact on wider rural environments and communities
- Exposure to distant events creates an intrinsic instability in global networks that requires the repeated adjustment and re-assembling of farm systems



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Presentation slides available at:

www.globalruralproject.wordpress.com