Rugged Individualism versus co-operative enterprise: different responses by New Zealand pastoral farmers to agricultural change

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Introduction

In relation to sustainable land use, this paper explores the different responses by New Zealand dairy farmers on the one hand and sheep and beef ('drystock') farmers on the other, to changing global trade patterns and government policies over the past fifteen years.

As part of a co-operatively structured food processing industry, dairy farmers have been able to respond differently from sheep and beef farmers to the pressures of diminishing returns for their product. However, despite the apparent success of the dairy industry in withstanding global economic competition, dairy farmers may be caught in a perverse logic of environmental over-production that undermines their ability to farm sustainably in the long-term.

By contrast, sheep and beef farmers are facing the environmental effects of their activities in a climate of diminishing economic returns. Lower economic returns have forced many to diversify their activities and become more selective about matching type of landuse to land capability. Although the response of these two types of farmers has been different, in both cases it has resulted in dramatic productivity gains. In the eyes of government policy advisors these productivity gains have justified deregulationist government policies of the past 15 years. But the gains in efficiency have not been without social and environmental cost, and it seems unlikely that they are environmentally sustainable in the long-term.

The Structure of New Zealand's Farming Industry

New Zealand agriculture is predominantly pastoral, based on sheep, beef and dairy cattle, with deer, cropping, farm forestry and horticulture as secondary forms of production.

Livestock farming in New Zealand is a low-input, low-cost form of production. It relies on year round grazing of animals in open pasture, using clover as the primary nitrogen source. Feed supplements for animals are minimal and there are relatively low inputs of nitrogen fertiliser. The great majority of farms are family owned and operated, either as husband-wife partnerships, or family trusts. Labour costs tend to be minimised by limiting the size and scale of farm operations to what can be achieved by a farming couple with the help of other family members. The advantages of increases in farm size are weighed against the high relative cost of employing outside labour.

Economic and agricultural changes over the past two decades

There has been fundamental and widespread change within New Zealand farming over the past two decades. In 1960 New Zealand's exports were still predominantly agricultural, and 53% of them went to Britain. The US received a further 13%, so that some two thirds of New Zealand exports were to markets which gave a relatively

high return for product. As Britain prepared to join the European community in the 1970s, farmers and their producer marketing boards sought other markets. By the end of that decade, Britain accounted for 17% of New Zealand exports and trade to Japan and the US had increased to 15% respectively. However, in the face of generally protective measures for their own producers by the US, Japan and Europe, New Zealand's export destinations, of necessity, continued to diversify. By the mid-1980s, 47% of New Zealand's trade was to "other countries". For the most part, these were countries that were less wealthy than UK, Australia, Japan and the US. Many were 2nd or 3rd world countries which could not afford expensive highly processed products. This meant that New Zealand farmers, both meat and dairy, faced pressures to maintain and improve on their low-cost production methods.

The erosion of price returns relative to rising costs of production was masked in the 1970s and early 1980s by a host of government support measures for farming. The mask was abruptly withdrawn in 1984 with the introduction of deregulationist policies when a new Labour government came to power. [Le Heron, 1991](Roche 1992). Before 1984 the farming sector had been a politically influential force of New Zealand society, heavily subsidised by production price supports, subsidies (e.g. for fertiliser and transport) and production incentives (e.g. land improvement loans). (Roche 1992) The new government almost immediately withdrew all agricultural price supports and incentives, so that by the end of 1985, from being one of the most heavily subsidised sectors of society, New Zealand farmers received no supports [Walker, 1984]. In addition, there was a revaluation of the New Zealand dollar resulting in a major reduction in the price farmers received for their products. Farm incomes fell suddenly and drastically, with hill country sheep farmers suffering in particular. On average, sheep and beef farmers experienced a fall in net real farm incomes between 1983/84 and 1985/86 of 39% (Smith and Saunders 1996)

However, dairy farmers have not been immune to declining terms of production. Looking at the dairy industry, Parker and Holmes (Parker and Holmes 1997) show that the price received by farmers per kilogram of milk solids decreased from $7.46/kg in 1950 to between $3.50 and $4.00/kg in 1985, where they have remained more or less since.

The response of dairy farmers to economic changes

Dairy farms on the one hand and sheep and beef farms on the other are tied to their respective industrial food processing chains by different organisational pathways. Whereas the dairy industry is a tightly organised and vertically integrated producer-owned industry in which farmers are closely involved with the organisations that process and market their dairy products, the meat industry is less tightly integrated and sheep and beef farmers tend to be less closely tied to the firms that process and market their meat.

The milk produced by dairy farmers is processed by 13 farmer owned co-operative dairy factories into a range of dairy products (e.g. milk powder, butter, various cheeses, casein and various casein products) which are then exported by the New Zealand Dairy Board (the Dairy Board). The Dairy Board is sole marketing agent for New Zealand's dairy exports. It operates subsidiary companies in Australia, Europe,

Latin America, the Middle East, Asia, and North America, and service industries within New Zealand such as the Dairy Board Finance Corporation, and Livestock Improvement Corporation (for livestock breeding and semen export). It also spends significantly large sums on research into food product development and marketing. (Board 1998)

The dairy factories own shares in the Dairy Board. Export earnings are paid by the Dairy Board to the dairy companies that supply the products. They in turn pay their suppliers on the basis of the milk supplied. A portion of the return to farmers is retained for reinvestment in the industry. Farmers are sole shareholders of the dairy companies, and their shares are proportional to the milk they supply.

The Dairy Board and its subsidiary companies are significant players within the global food industry. All but a small fraction (4% or so) of the milk produced in New Zealand is processed for export. Although New Zealand dairy production amounts to less than 2% of the world total, it comprises some 25% of the milk exported on the world open market.

The response of the dairy industry to the economic pressures created by global trade patterns and the government deregulation of 1984 has been twofold: at the farm level, farmers have generally sought to create economies of scale by increasing total farm milk production; and at the milk processing level, the industry has sought both to process all the milk that it receives (since the milk suppliers are the owners of the facilities), and to increase the value of the processed products through more sophisticated processing technologies, packaging and marketing.

Farmers can increase milk production by increasing production per hectare or increasing the number of hectares in dairy use, or both. All of these trends are clear from the dairy statistics shown in Table 1.

Table 1. Summary of New Zealand herd statistics since 1974/75
Source: (LIC 1998)

Season	Herds	Total cows	Av. Herd size	Kg/Milkfat/cow	Av. Effective ha	Av. Cows/ha
1974/75	18540	2,079,886	112	128	<60	<2.0
1997/98	14673	3,222,591	220	168	87	2.6

Table 1 shows that since 1975 the average size of farms has increased (from less than 60 effective hectares to 87 effective hectares); the average size of herd has increased; the average production per cow has increased (through selective breeding) and the number of cows per hectare has increased (through more intensive pasture production and pasture management). A consequence of farm size increases has been that many smaller dairy units have been bought out and amalgamated to make larger units.

In making changes toward increased production efficiency, dairy farmers have been helped by the co-operative structure of their own industry. The Livestock Improvement Corporation, which is owned by the Dairy Board, provides an artificial breeding service, herd testing and herd record service, milk content analysis, and

farmer advisory services. The farm advisory services include organised farmer discussion groups, and a user-pays service for farmers who want advice on specific issues. Almost every dairy farmer in the country has access to the most up-to-date information about their herd's performance, breeding options, and farm management practices. While not all farmers make use of these services to the same degree, they provide an effective and practical way that farmers can learn from each other. They both depend on and foster a spirit of co-operative learning and problem solving.

Diversification of farm production does not, to this point, seem to have been a significant response of dairy farmers, at least in the main dairy regions of New Zealand. Although there has been some increase in cropping and farm forestry in recent years, these are often linked to dairy management rather than as an alternative or supplement to dairying. For example, maize cropping may be used as an interim process in the case of pasture or soil renewal, and trees may be grown to make use of otherwise unusable steep slopes. Sub-economic dairy farms may involve pluriactivity, where one or both partners seek off-farm income supplements, but for the most part, on-farm activity remains some form of dairy related production (for example, it may include stud breeding, calf rearing, or grazing of heifers), because dairying is the most immediately profitable landuse option[1].

Unfortunately, the environmental effects of dairying can be substantial. In the Waikato region of the North Island, for example, a report on the state of the region's environment by the regional council (Environment Waikato 1999) reported the following impacts of agriculture (to which the dairy industry in particular contributes):

- widespread soil erosion;
- soil compaction and pugging (with resulting loss of soil physical condition);
- reduction and degradation of wetlands from land drainage and lowering of water tables (estimated 75% reduction from 1840 area of wetland);
- oxidation and shrinkage of peat soils from land drainage and lowering of water tables;
- non-point-source pollution of surface water (rivers and streams) as a consequence of soil erosion and farm nutrient run-off;
- nitrate contamination of groundwater to the point where, in parts of the region, nitrate levels are higher than accepted international standards for drinking water;
- loss of indigenous biodiversity, largely as a consequence of habitat loss, habitat fragmentation, and habitat isolation.

Continued pressures to intensify and extend dairy production mean that the environmental problems caused by dairy farms are likely to become more widespread and to intensify as dairy farmers try to keep pace with global competition.

Response of drystock farmers to economic changes

Historically, the structure or the meat industry has been more complex than that of the dairy industry, involving a combination of public share companies, farmer co-

[1] In the case of sub-economic diary farms, horticulture may become a more profitable alternative, but the knowledge and skills involved in dairying are not easily transferred to horticulture, and it is likely that dairy farmers will sell out altogether (to a neighbouring dairy farmer, or to a horticulturalist) before they will take up horticulture themselves.

operatives, and government agencies. Whereas the dairy industry has been based on co-operative ownership of dairy factories by farmers since its early beginnings, until the last decade the meat industry was dominated by subsidiaries of a small number of large overseas-owned companies. Company management was answerable to overseas shareholders rather than the farm producers. Farmers had less control of the processing and export sectors of their industry than did the dairy farmers, and less reason to feel commitment to the company to which they sold their stock. Farmer owned co-operatives also existed, but farmers could and did move stock from one processing company to another depending on the prices they received.

The past two decades have seen major changes in the meat industry. The industrial giants have closed and been replaced by a larger number of small New Zealand owned or farmer owned co-operative companies. Where 11 processor and exporting companies operated forty five plants in 1986, thirty-two companies operated 61 plants in 1994. (Lynch 1996). Ownership by farmers increased but by 1994, 35% of the sheepmeat industry was still in the ownership of public or overseas companies, and 32% of the beef industry.

Like the dairy industry, the meat industry is heavily export oriented. Eighty five per cent of New Zealand's lamb production, 70% or the mutton and 80% or beef production is sent overseas, and New Zealand provided 46% of the international trade in sheepmeat in 1994, and 6% of the beef trade (Lynch 1996) In the light of pressures to off-set the costs of production, the meat industry has increased its processing efficiency and diversified its product range and its market destinations. A host of innovations have been developed including accelerated conditioning, shrinkwrapping, increased shelf life and automated dressing of sheep and lambs.

Despite these developments, export returns for meat have fallen relentlessly and, as shown by Table 2, dairy exports have replaced meat as New Zealand's largest agricultural export.

Table 2 - New Zealand exports of dairy, meat, and wool, 1989 - 1997, constant 1991/92 prices

Source (Statistics New Zealand 1997)

		$(Million)		
Year	Dairy	Meat	Wool	All NZ Exports
1989	2439	2728	1147	19115
1997	3933	3027	2175	27712
%Change	61%	11%	90%	45%

Rugged Individualists versus Co-operative Enterprisers

Writing in 1994, Lynch argued that one of the key issues facing the meat industry is "the relationship between producer (farmer) and processor. . . there is no doubt that a serious problem for meat companies is the reluctance of farmers to commit themselves to maintaining continuity of supply to individual companies through a processing season" (Lynch, 1996:144). He suggested that a major requirement for the industry is "achieving a higher level of stakeholder commitment to company

profitability, strengthening intra-industry co-operation, and consolidating the ties between producer and processor"(Lynch 1996)

The meat industry is more fractured and segmented than the dairy industry and does not have the same co-operative support structures as the dairy industry. There is no equivalent to the LIC farm advisory service and discussion groups. Although the industry has made enormous efficiency gains in the past 15 years, sheep and beef farmers have had to struggle much more as individuals in their response to change.

The response of sheep farmers in particular to the pressures of economic deregulation and continued decline in the terms of trade has been highly varied, and very different from the responses of dairy farmers. It appear as if, to an extent, there are cultural difference between drystock farmers and dairy farmers, and these differences are encapsulated by the description of sheep farmers as rugged individualists and dairy farmers as co-operative enterprisers.

Studies show that initially the most common response of sheep farmers was a drastic reduction in farm inputs such as fertiliser, repairs, and employment of off-farm labour (Fairweather, 1987; Johnsen, 1999; Smith, 1996. On a longer term basis, there has been a continuing fall in the number of sheep from 51 million breeding ewes in 1984 to 33.7 million in 1995 (Statistics New Zealand, 1997). The area of land given to sheep has declined 27% from 11.3 million hectares in 1985 to 8.2 million hectares in 1995 (Statistics New Zealand, 1997)On many farms there has been reversion of farmed pasture back to scrub. This has been accompanied by ongoing dependence on multiple sources of on-farm and off-farm income (Walker and Bell 1984),(Pomeroy 1998) and an ongoing diversification in the range of landuse options pursued. For example, Meijer noted that many farmers have diversified into deer, goats and trees. (Meijer and New Zealand. Ministry of Agriculture. 1996). Some farm families have shown a high degree of enterprise (Taylor, Little et al. 1997), with women in particular involved in the development of new farm enterprises. Enterprises found by Taylor included farm tourism, specialist horticulture (dried flowers, herb production), viticulture, agricultural services (e.g. fencing, sales of machinery), light manufacturing (e.g. custom-made furniture, fruit pates) handcrafts (pottery, machine knitting,)

There is debate about the long-term environmental effects of farm responses to the elimination of agricultural supports. Government policy analysts and those with an economic perspective tend to regard the overall effects as beneficial because it has resulted in a reduction of sub-optimal land devoted to livestock production, and has clearly resulted in efficiency gains in terms of meat exports relative to stock numbers (Walker and Bell 1984; Reynolds, 1993). However, a number of academic writers have suggested that the market orientation within which farmers now operate has resulted in shortened time horizons and a reduction in long-term environmental investments. Thus Smith and Saunders note that since 1984 all 16 farmers in their study of lower North island hill country farmers had run down their environmental capital (Smith and Saunders 1996). Bradshaw et al (Bradshaw, Cocklin et al. 1998)found for a study of Northland farmers that although many wished to make environmental improvements to their farm, they were unable to do so because of lack of farm surplus. They conclude: "In summary, the post 1984 removal of subsidies in

support of activities which protect or enhance the environment can be considered a contributing cause of reduced employment of these activities. Further, to the extent that the broader post-1984 policy reforms, both within and beyond the agricultural sector, can be shown to have contributes to less stable or reduced farm incomes, these reforms can be considered a further contributing cause of reduced participation in environmental stewardship".

A similar conclusion is reached by Blunden et al when they write that "environmental protection is likely to receive a lower priority during downturns in farm product prices, although economic good times are no guarantee of active measures to protect the land. . . . Many of these farmers have undertaken activities on their farms which we classified as environmental projects, such as riparian planting, effluent treatment and erosion control, and many indicated that they would continue. Yet, lack of time and money prevent them from doing more. (Blunden, Chris Cocklin et al. 1996).

Conclusion

Many of the changes which have affected New Zealand agriculture and rural society mirror those which have affected Europe and elsewhere (see (Symes and Jansen 1994). Increasing costs relative to returns have forced farmers to look for new ways of earning their living. In the case of dairy farmers, this has involved intensification or extension of milk production at the farm level and greater value-added processing at the factory food level. A commitment by dairy farmers to their industry has helped both to provide capital for the industry, and to increase the rate and level of management efficiency at the farm production level. This strategy, has maintained farm incomes in the immediate term, but at the cost of the environment, and long-term agricultural sustainability. In some parts of New Zealand environmental stresses appear to be reaching a point where further intensification or extension will not be physically possible.

Sheep and beef farmers have been less successful at resisting the decline in returns for their meat and wool products, but have proved highly resourceful in their efforts to diversify sources of farm income. Many have diversified their landuse practices in ways that acknowledge differences of landuse capability (e.g. by planting trees on parts of the farm, or grazing a mix of livestock), and overall, there has been a reduction in the area devoted to pastoral use. Diversification of farm income sources and less dependence on agricultural landuses appears to offer opportunity for balancing production from the land with environmental considerations. At least superficially, drystock farmers appear better placed than dairy farmers to make changes toward more sustainable farming systems. However, a number of academic writers are cautious about concluding that the changes undergone by sheep and beef farms are in the direction of greater sustainability. They argue that in an unprotected, market-led environment, farmers do not have the security and surplus time and cash to invest in environmental stewardship, despite their desire to do so.

These results and reflections suggest that despite current government policies to resist measures of practical support for farming or environmental protection, changes will have to occur at central or regional government levels to bring about farming practices that are both economically viable and environmentally sustainable in the long term.

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