A Nuffield (UK) Farming Scholarships Trust Report

August 2013

"Leading positive change in agriculture.
Inspiring passion and potential in people".

Title	**Why are you farming – business or pleasure?**
Scholar	Tim McClelland
Sponsor	The Thomas Henry Foundation
Objectives of Study Tour	1. To compare and contrast business practice in family farm businesses within the United Kingdom- and in particular Northern Ireland - with the rest of the world. 2. To evaluate levels of "responsiveness to change" within these same business units. 3. To bring recommendations as to how change can be effected within farm businesses in the United Kingdom and in particular Northern Ireland.
Countries Visited	• New Zealand – visited October and November 2012 • Australia – visited December 2012 • Chile, Peru and Brazil – visited February 2013
Findings	• A farming business is two businesses, not just one. • Correct skills set and early control vital for farmers. • Written strategic and risk management planning essential. • Business performance monitoring essential. • Farmers must talk profit, profit, profit. • The rules of profit must apply when responding to change. *"Production is vanity, profit is sanity, cash flow is reality…"*

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Disclaimer

The opinions expressed in this report are my own and not necessarily those of the Nuffield Farming Scholarships Trust, nor my sponsor, nor any other sponsoring body.

1. Introduction – who am I?

My name is Tim McClelland. I'm married to Karen and together we have four lovely kids: Cameron (9), Rachel (7), Hannah (4) and Nathan (2). As a family we live on the home farm just outside Tandragee, County Armagh, in Northern Ireland.

I left school in 1985 with five GCE "O" Levels. Next stop was Greenmount Agricultural College. After completing the one year Certificate Course in Agriculture it was off home to the family farm. Apart from attendance every day at the "university of life" that was the summit of my academic achievement. Until 2008 that is! At that time I enrolled at the University of Ulster for a Master's Degree in Agri-food and Business Development. I was awarded that degree in July 2010.

From 1997 to the present day I have been the managing partner within the family farm. The farm extends to 112 ha and is a mixed arable and grassland business. Ninety ha of mostly spring sown arable crops are produced. Feed wheat, conservation grade oats, oilseed rape and certified seed oat and barley crops are produced. The seed crops are grown, field certified, processed and marketed through "Clare Glen Seeds". This small company, which is integral to the farming business, also imports cereal seed from the UK mainland which is further marketed to local cereal farmers.

Grass silage is produced on farm. This is either sold as a "cash crop" or fed on a "bed and breakfast" winter keep basis to suckler cows and drystock.

Me, Tim McClelland

Environmental awareness is central to how this farm business is managed. The business works closely with the RSPB. I am passionate that the "disconnect" between farmers and general public must be bridged. We as farmers must get the message to the public that we, apart from feeding them, bring extensive benefits to the countryside and the landscape where we all live. Bird nesting and sighting surveys are a regular feature on this farm. Two recent awards, the 2011 Northern Ireland FWAG Silver Lapwing and the 2013 RSPB NI Nature of Food and Farming success have proven our environmental credentials.

The farm is an Agriculture Department "Focus Farm" meaning groups of farmers and students visit on a regular basis. Innovation and best practice are two aspects of what happens on this farm that are demonstrated during these visits.

I am employed by the Countryside Rural Partnership to deliver short courses to farmers. Farm Safety, Field Boundary Management and Cross Compliance are three of the courses I deliver. Until recently (June 2013) I was a member of the College of Agriculture and Rural Affairs Advisory Group (CAFRE). This group advises the senior management of Northern Ireland's only agricultural college.

Farming politics have played a central role within my life. Serving within the committee structure of the Ulster Farmers Union (UFU) for the last 20 years, I am a past Management Board member (2002-2006) whilst also serving as Chairman of the Seeds and Cereals Committee (2004-2008). Currently I represent the UFU on the Voluntary Initiative (VI) steering group. The VI seeks to promote the responsible use of pesticides within UK agriculture.

Outside farming I have a wide range of interests: first and foremost, my dear wife Karen and our four beautiful children. It is great to have a job or career that allows a degree of flexibility which enables me to be at home at lunch time or mid-afternoon (dreaded homework time!). There is never a dull moment in this house! Our children grow up so quickly that even spending a little extra time during these early formative years is crucial.

As a family our local church plays a central role in family life. Involvement in church life and the "things of God" are part of an eternally important dimension of our existence.

Supporting the Ulster Rugby Team, following Association Football (no particular team) and news, politics and current affairs are other extra curricula activities in which I take an interest.

2. Why this topic?

Family farm business units within the UK are dominated by owner managers. Every aspect, from the day to day decisions, the financial management, the strategic decisions and the administration are all heavily influenced by this one individual.

Furthermore the land and the infrastructure that are at the heart of these family business units has been owned by the same family - in some cases for hundreds of years. Tradition or "the hand of family history" can, and in most cases does, weigh heavily on the current owner.

This sentimentality will often lead to owner managers within these units being "risk adverse". Fear of change or fear of the unknown are two driving factors for this attitude to risk. As a result any innate entrepreneurial ability possessed by these owner managers is very often repressed.

A farm business that is risk adverse will, by definition, only change and develop slowly, if at all. Production systems and the management culture will seldom change no matter whether the business is turning a profit or not. The "hope of better times ahead" will keep the business sustained in the bad years. The thought or the possibility of change will never be considered.

Being risk adverse and slow to change are two fundamental weaknesses that I believe affect numerous family farm business units in Northern Ireland and across the rest of the UK. In a fast changing world, UK farmers must adapt to meet the challenges ahead.

Put bluntly, I can see myself and how I run and manage my own business reflected in the previous five paragraphs of this introductory chapter. My business has to adapt and change. What is true for me is, I believe, also true for numerous other family farm business units in the United Kingdom.

> My business has to adapt and change

Agriculture has a great future ahead. The ever-growing global population has to be fed. We as UK farmers must be ready for this future! Charles Darwin said: "it is not the strongest or the fittest that survive, but those most responsive to change".

For my business to survive and be viable change must happen. Failure to "move with the times" will mean this business will not be worth offering to the next generation of the McClelland family! How do I become more responsive to change?

Answer – go see, go get and go bring back knowledge from the best in the rest of the world!

This knowledge, when "repatriated" to the UK, has the potential to lead to behavioural change both within my farm business and the across the wider industry. If this change happens my business can be successful and grow.

That is - to answer the question: why this topic? - the primary reason.

3. Where I travelled

When choosing countries to visit as part of my Nuffield Farming Scholarship study tour it was important to focus on agricultural industries where I could glean the most information relating to my topic. My study is primarily about business culture and management practices. Some time spent looking at a farming sector that has a proven record of being responsive to change would clearly be relevant. A clear "business" and market focus would add richness and depth to my study.

Benefit from the study of countries with agri-food sectors that are willing to be open, transparent and willing to share both the positive and the negative experiences would be an advantage.

Clearly one country, **New Zealand,** ticked all the boxes in terms of the above criteria. In my mind the case for visiting this country was very strong. New Zealand became the main focus of my Scholarship. In total I spent 37 days touring the country from the top of the North Island to the bottom of the South Island.

Being from an arable farming background, a study located in a major grain producing region of the world was of interest. Such a visit had the potential to add a breadth to the study topic that would be beneficial. On a personal level I have always been fascinated by what I have heard about arable farming Western Australian style! With their many challenges - mainly, if it rains during the growing season, that's a good year. If no rain – don't bother servicing the combine – there won't be anything to harvest!

Second country, yes you've guessed – **Australia**. I travelled in Western Australia for 10 days, spent five days in South Australia and finished off with two days in Victoria.

During the Contemporary Scholars' Conference in London in early March 2012 a previous Nuffield Farming Scholar asked me what my subject was and where I planned to travel. After mentioning the topic and the outline plan of travel to New Zealand and Australia I got a surprising response. "You are not stretching yourself!" followed by "You want to get off a plane and not be able to speak the language!" The South American seed was sown.

My study is primarily about business culture and management practices.

When fellow 2012 UK Scholars, Heather Wildman and Robert Craig asked for company for two weeks in Chile, Peru and Brazil, that was that. Six days were spent in **Chile,** three days in **Peru** finishing off with four days in **Brazil.**

4. The business of farming

This report will in no way turn into a piece of academic literature. Yet it is important to make mention of principles, as laid down in the text books, that form the basis of managing any business. Several of these are:

- The owner must have the vision to realise some product or service can make money
- All costs relating to the product or service must be known
- A high degree of "market awareness" is essential.
- Horizon scanning necessary - what are the competitors doing? What is the "next big thing" in the sector?
- A strategic plan must be developed for the business
- All decisions must be based on evidence rather than emotion

At this stage several general points need to be made in relation to farm business units.

Firstly - David Todd, a farm consultant in New Zealand said: "*Emotional connections to farming make it different. Given that, it is still a genuine business*".

Point to emphasise – farming is that little bit different to any other retail or manufacturing business

Secondly - it is wrong to say that all the "good business managers" are in New Zealand or the United Kingdom or anywhere else for that matter. In every country there are farmers who, from "the business of farming" perspective are at the top of their game. Geographical location does not really matter – the *skills set* of the individual does!

Thirdly - within agriculture some sectors are easier to performance-monitor than others. The dairy sector with daily produce sales is easier to business-manage than the beef and sheep sector which has perhaps only two annual marketing events.

Fourthly – mixed farming businesses, in terms of numbers of different enterprises, are much more complex and difficult to performance - monitor than single enterprise units. Fixed costs and depreciation are two factors that become harder to apportion within a diverse business.

The four general principles outlined above are, I would argue, true of agriculture wherever in the world farming is practised. Reference will be made to these points as we go through the following chapters.

Compare and contrast : the business of farming

5. The business of farming – New Zealand style

5a. New Zealand agriculture – an introduction

New Zealand agriculture, from Minister David Carter down, knows the importance of the farming industry to the overall New Zealand economy. The country is no longer seen globally as a "low cost-of-production agricultural economy". The notion of "Brand NZ" will ensure that farmers will adapt to meet the economic and environmental challenges that lie ahead. Farm debt levels were at staggering levels when I visited in late 2012. Total bank borrowing by farming businesses in New Zealand (the total money owed) is higher in only two other countries in the world. As a result of these factors, amongst others, the infrastructure around farming in New Zealand is very co-operation orientated.

Co-operation is part of the culture given that, for example, 90% of the fertiliser used on farms in New Zealand is purchased from one of two companies. An Act of Parliament was necessary to allow the dairy co-op Fonterra to come into existence. Fonterra now has a dominant position within the NZ dairy sector. Two meat companies purchase the vast majority of the beef and lamb from farmers in New Zealand. Veterinary practices are also run along co-operative lines. These are three are examples of how farming businesses "do" co-operation.

One of the most interesting and informative days I spent was attending a NZ Beef and Lamb seminar titled "Framing the future of your farming business". Although the purpose of the event was to encourage farmers and farm families to think about succession issues, time was also devoted to "business of farming" issues. A panel of experts gave a series of presentations and led interactive sessions designed to stimulate the thoughts of those present.

Farmer co-operation New Zealand style

5b. S.M.A.R.T planning

The farmers present were encouraged to do two common sense things. First of all - be S.M.A.R.T. And secondly - put pen to paper.

S.M.A.R.T is all about how we develop a vision, plan a strategy and build a plan to develop our business units in the future. S.M.A.R.T means our business targets should be –

- Specific
- With measureable key performance indicators
- Achievable
- Realistic goals
- Time bound

Having the plan written down is just as important as having the plan! A written document allows for regular review. It also allows the author (the farmer in this case) to take ownership of the plan. Regular reviews will prove to be much more meaningful when this process occurs. Essentially "*ink creates action*"

The overall aim of the S.M.A.R.T. process is to assist the business manager in the long term development of the unit. As someone at the event said of family farming businesses, their owners "have to make planning compelling".

Farmers must know their "spheres of influence" - the things they can control. Three key words are CONTROL, INFLUENCE and CONCERN.

- There are only a small number of things that individual business owners can CONTROL.
- There are a slightly larger number of issues that they can INFLUENCE.
- Thirdly, there are an even greater number of areas of CONCERN that they have no influence over whatsoever.

Stating the obvious you may say! Yes, point taken. But refreshing to hear mentioned at a farmers' meeting none the less.

"Financial Direction and Understanding" was the title of a seminar paper where the following were outlined as MUST DOs for all farm business owners:

- Develop a strategic plan for the business
- Develop a growth plan for the business
- Take cost out of the business
- Work to improve the risk profile of the business
- Resolve succession issues

At the risk of repeating myself these messages all serve to underline things that farmers "have to action" if their business units are to have a viable long term future.

An accountant at the seminar was asked what, in his view, were the two best ways to monitor business performance. In response he said:

1. The business has got to be profitable.
2. Use of an accountancy mechanism called a "Balance Score Card"

Let me expand on these two points:

Profitability first of all: for this to be effective as a business performance tool, information must be known early. When data is known decisions can be made in a timely fashion. There is no point waiting for six months or a year for information. To illustrate the overall point, a famous accountant Peter Alexander was quoted as having said: "Profit is a decision: your decision".

5c. Balance Score Cards

Secondly, the Balance Score Card (BSC). Two academics, Kaplan and Norton in 1992, identified a disconnect between business monitoring and business strategy. Initially uncovered in non-farming businesses the problem was later observed in the farming sector. Essentially business plans were, and are, quite common in the farming sector. Historically however, the plan was rarely, if ever, referenced or compared to the overall strategic plan. The BSC was developed to provide a bridge between the two.

The model allows business managers to: define their management processes more clearly, to view the business from several different perspectives simultaneously, have an understanding as to how the various goals of the business interrelate, and resolve the conflict that exists between them.

The Score Card forces the perspectives of:

- Human resources (innovation, continuous improvement and learning)
- Internal processes (turning inputs into outputs)
- The market (customer relationships, product and service criteria)

- The shareholders (profitability, return on assets, wealth, non-financial and ethical goals)

all to be explored and the linkages between them to be determined.

The Balance Scorecard approach is built on a series of linked hypotheses. Having a strategy implies *"the movement of the business from its present position to a desirable, but uncertain future position".* To enable the business to arrive at somewhere it has never been before a pathway must be identified. This pathway involves a series of linked hypotheses. The BSC enables these strategic hypotheses to be described as a set of "cause and effect" relationships that are explicit and testable. **See Fig. 1 on next page**

Construction of the BSC for any farming business is a four stage process:

- Stage one outlines the strategic business goals from several perspectives and evaluates the balance between these goals.
- Stage two develops key performance indicators (KPIs) for each goal including outcomes (lag indicators) and drivers (lead indicators). **See figure 2 on page 10.**
- Linkages between these indicators are also identified.
- Stage three is the construction of a "partial wiring" diagram that explains these linkages. **See figure 2 on page 10.**
- The fourth stage is the development of a strategy map that can be used to chart the success of a business in achieving its objectives**.** **(fig.3, p. 11)**

The BSC, whilst "bridging the gap" between overall business strategy and the "day to day" implementation of strategy, should be seen as a living document. **Fig. 3, page 11** - The Balance Score card Strategy map - details how a business or organisation creates value. Notice the four measures are now arranged in hierarchical fashion:

- *Financial* measures at the top
- driven by *Customer* measures
- which are driven by *Internal process* measures
- which derive from *Innovation and Learning* measures.

Information should be accurate and up-to-date. As with all analysis, strategic analysis is only as good as the information provided. Unforeseen or unlikely risks or events can easily deflect a farm business from its chosen strategic path. For this reason regular reviews are necessary.

Often, non-financial indicators are drivers, indicating to the business manager what future performance is likely to be. It can be useful to view the relationships between KPIs as a continuum from the learning and growth stage through to the financial and shareholder point. Essentially this view helps to under-stand the relationship between the "higher" and "lower" levels of the long term business goals.

Figure 4 illustrates the continuum between the four perspectives. **See fig. 4 on page 12.**

Nicola Shadbolt and Sandra Martin, in their book "*Farm Management in New Zealand,"* make mention of a Balance Score Card as a very useful way of monitoring farm business performance. They take the view that "successful farm managers think more strategically about their businesses than do less successful managers". For this reason I felt it was important to dwell on the BSC concept within this chapter of my report. **Essentially a stronger business will be the result when the strategic direction is clear.**

Having given a flavour, in fact barely scratched the surface, on the subject of Balance Score Cards, this report will move to other tools that are useful for managing farm business performance. But, before we move, one last word on the subject! Nichola Shadbolt from Massey University takes the view that Balance Score Cards should be used in conjunction with key performance indicators (KPIs) as two vital ways to access farm business performance.

Fig. 1. Balanced Scorecard – Description

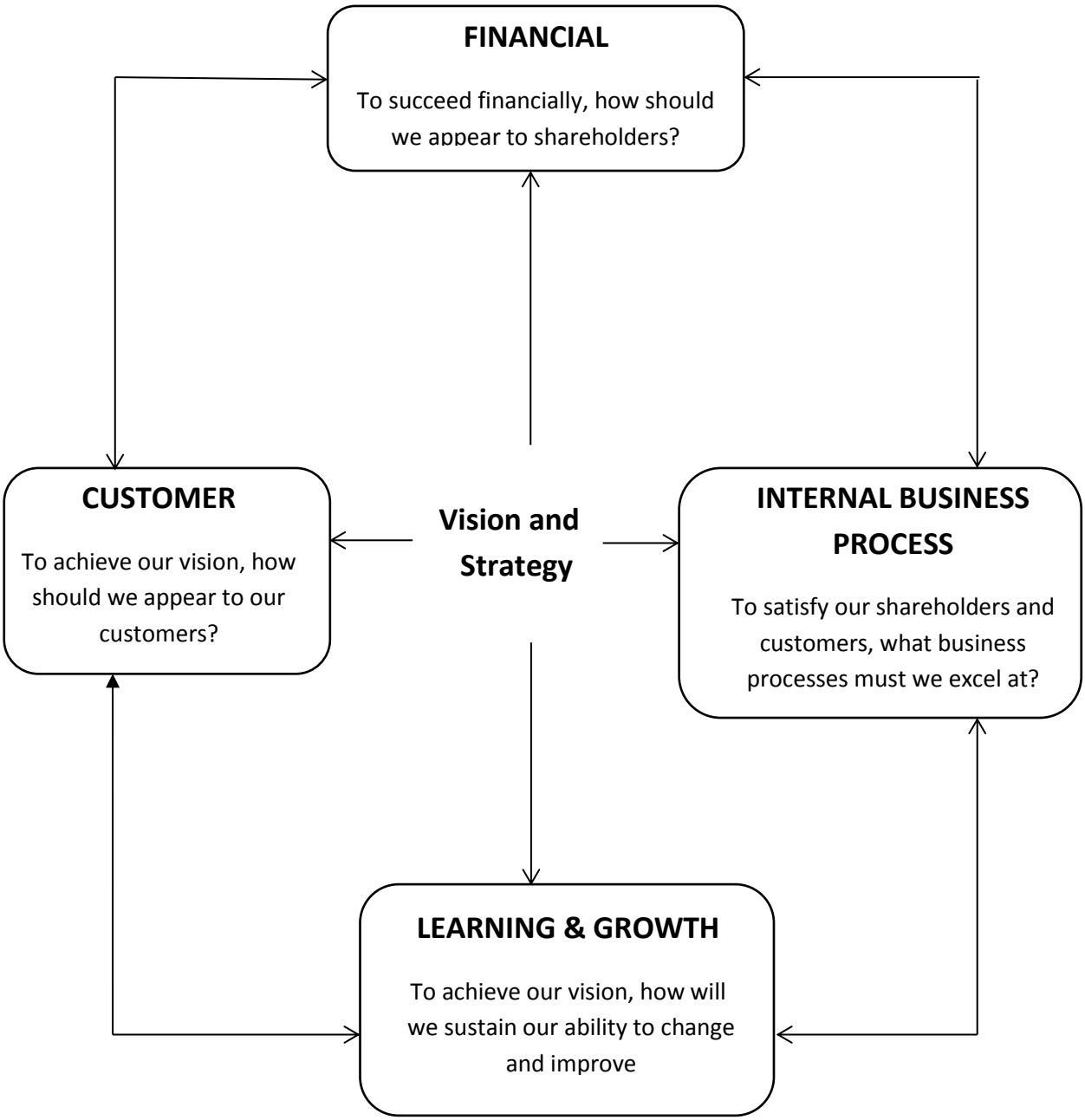


Fig. 2. Balance Score Cards – Partial wiring diagram

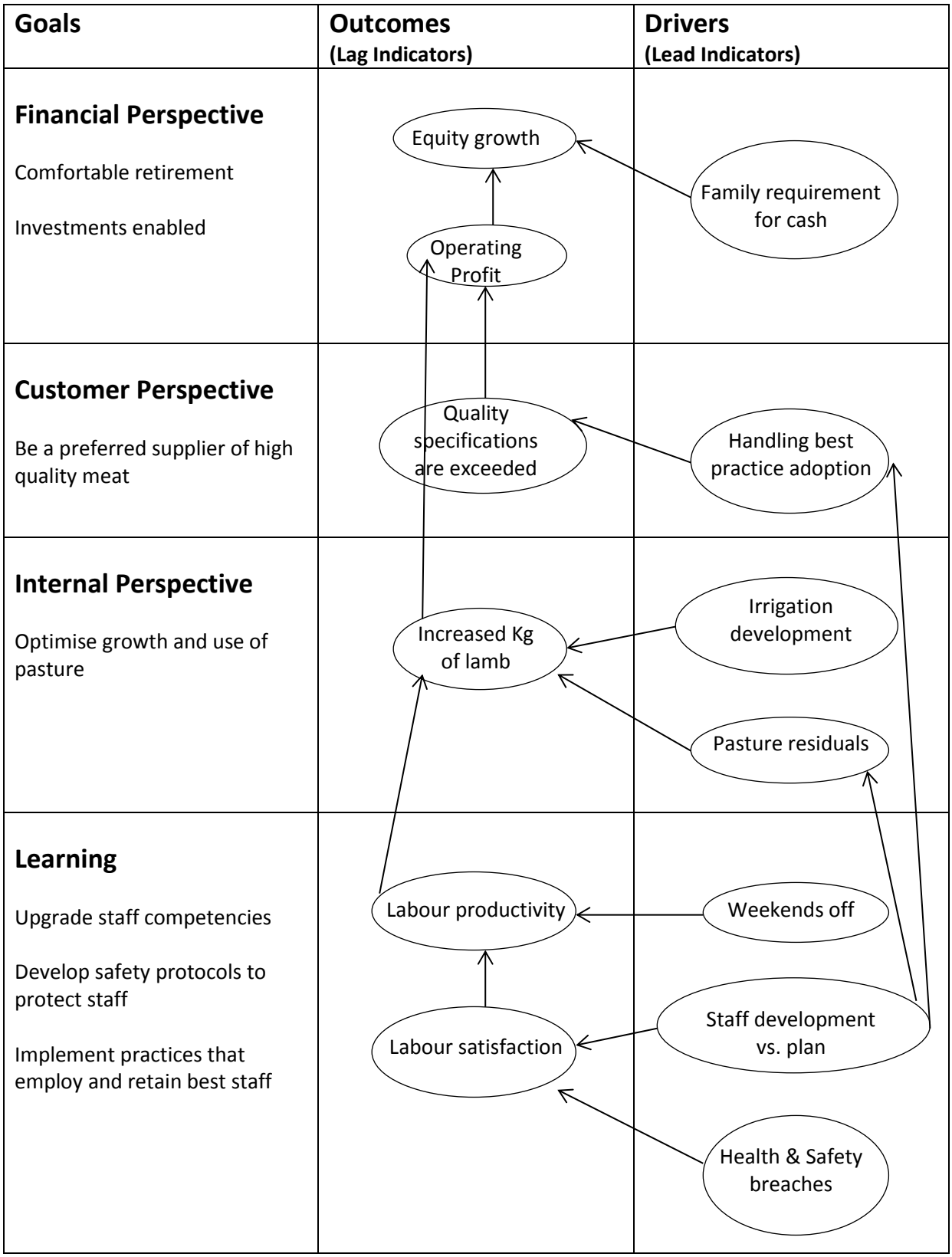
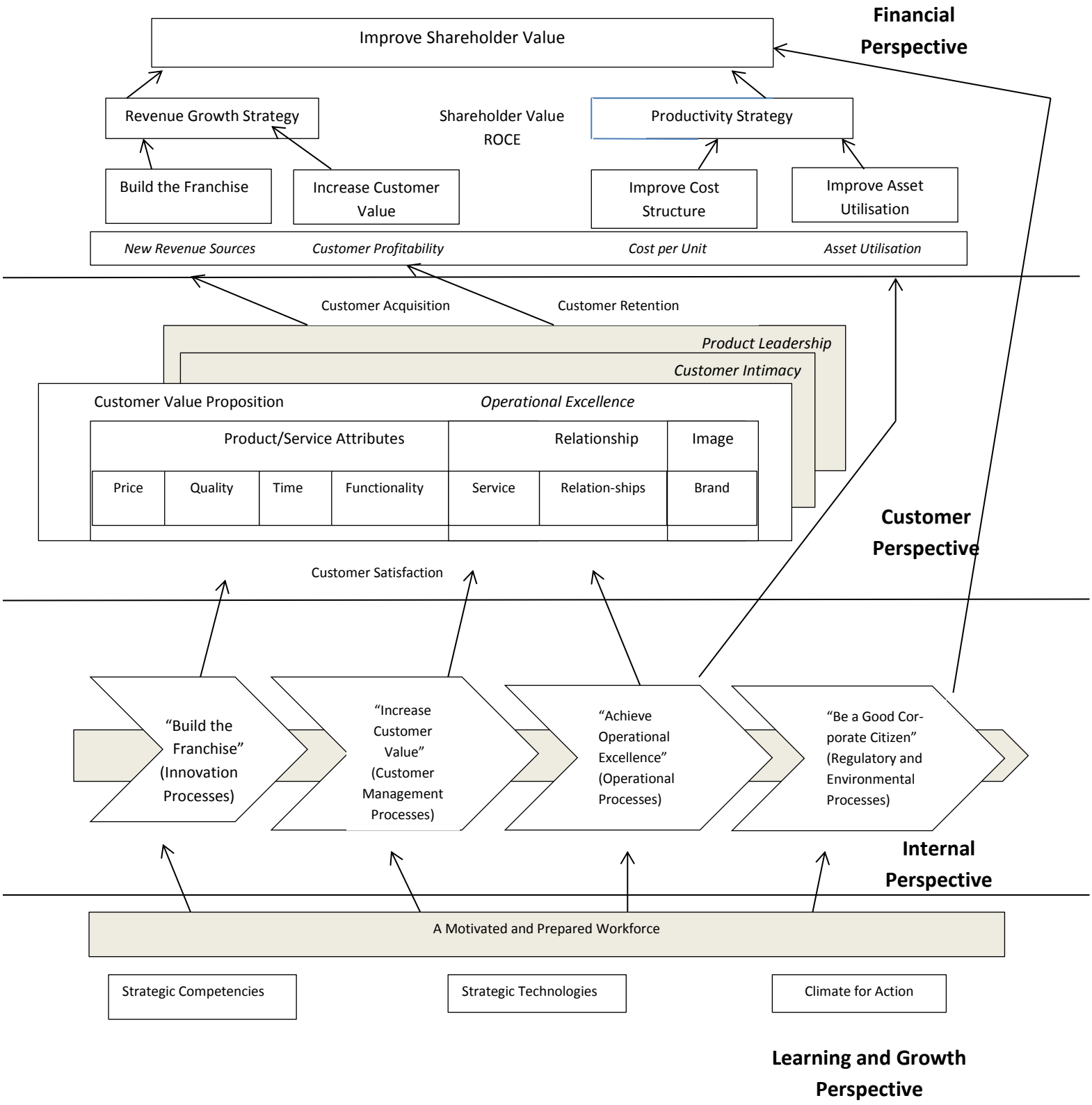
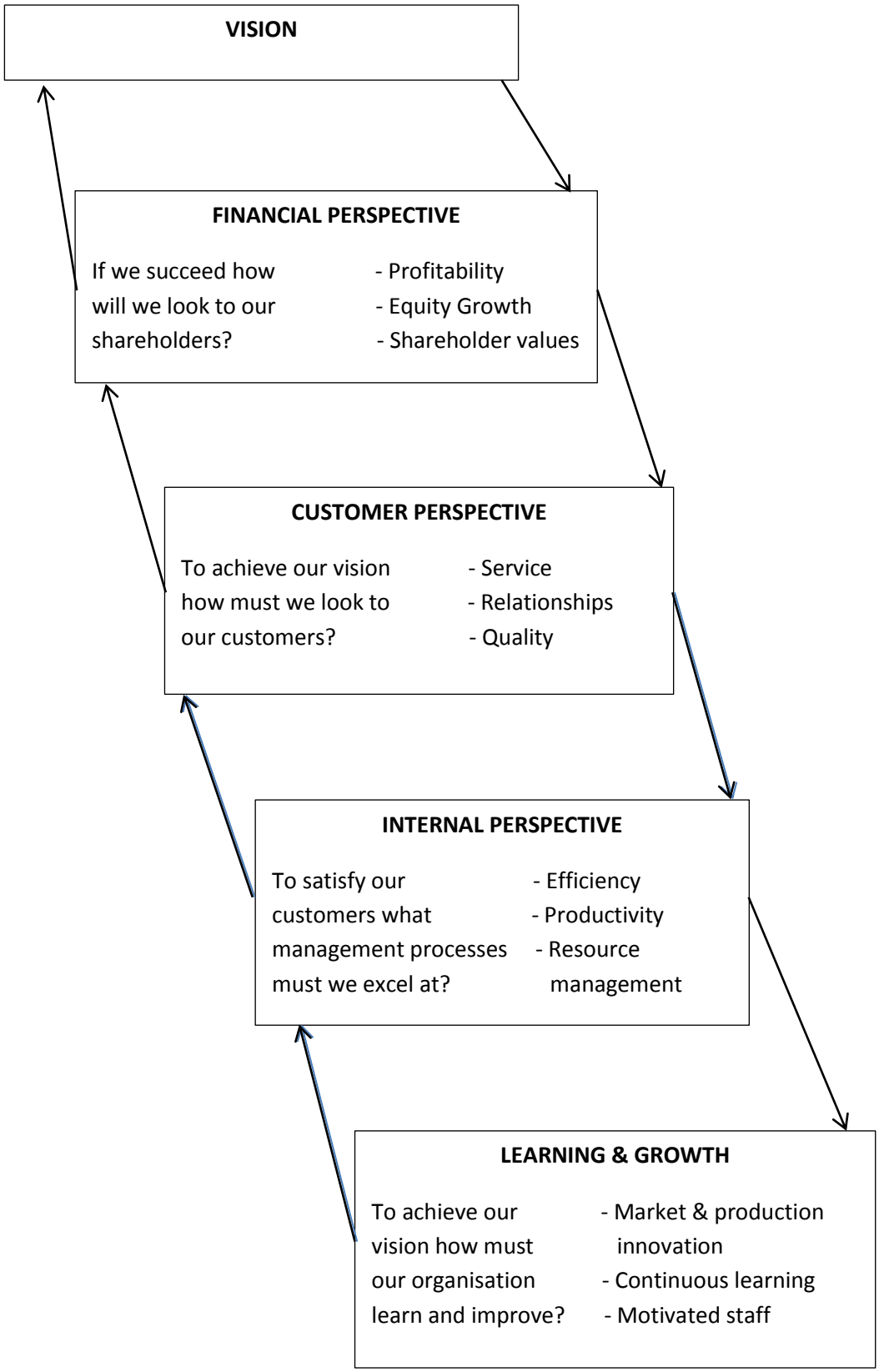


Fig. 3. Balance Score Card – Strategy map – the four PERSPECTIVES



Source: Kaplan and Norton (2000)

Fig. 4. Balance Score Cards – The continuum between the four perspectives



5d. Key performance indicators

Let us now focus on key performance indicators and the role they play within the New Zealand farming sector.

As already alluded to in the introduction to this chapter, some sectors, dairying for example, lend themselves to having robust key performance indicators. Regular sales of milk make that sector better able to monitor business performance. If milk production is reduced the result will become apparent very quickly; whilst – as an example - a beef and lamb business will not have as easy access to information on daily live weight gains.

Similarly a farm business that has only one enterprise will be easier to performance-monitor than a multi-sector unit. Apportioning the fixed costs in particular within such a business will be difficult. For example, a farm business has a beef and an arable enterprise. What proportion of a labour unit or machinery and equipment costs is given to each enterprise? This is impossible to differentiate.

When a farmer is setting up a system to monitor his or her business three key questions arise. These are: what factors to monitor, how best to monitor them and how frequently to monitor them. A range of different KPIs may be chosen by the business owner. These measuring points are designed to provide an indication of the overall performance of the business. Therefore it is important that they are tightly linked to the farmer's business goals.

When the decision has been made regarding what factors are going to be monitored the decision must be made as to how best to measure the factor. Measurement can be achieved using two methods. They are:

- objectively, using some type of instrument (e.g. scales or rising plate meter)
- subjectively, using the senses directly and intuitively (e.g. visual assessment of pasture mass or cow condition.

A recent study in New Zealand found that farmers monitored more than thirty different factors within their farm business. According to Shadbolt, when designing a monitoring system the farmer should consider the following –

- the validity of the measure (the what)
- the repeatability of the measure (the how)
- the timeliness of the measure (the frequency)
- the cost of measurement (time, capital)
- the accuracy of the measure

These five aspects must all be considered by the farmer when putting the monitoring system in place on his farm. Failure to choose the relevant monitoring factors or the frequency of the monitoring, for example, can lead to an ineffective system that does the business no good at all.

Two quotes from New Zealand to finish this part of the chapter serve to underline the importance of monitoring farm business performance:

The first one : ***"it is important farmers step back from their business units and focus on key performance indicators".***

The second statement makes reference to ***"a mistake people make is to focus on production rather than profit"*** when talking about key performance indicators.

5e. Other relevant information

The following are snippets of information that were gleaned from meetings during my travels in New Zealand. I believe these are relevant to my Scholarship subject.

1. Tom Phillips - who works with the Department of Farm Management at Massey University - raised the notion of Gross Farm Income (GFI) and how a model based on GFI can be a useful business performance tool. Variable costs, fixed costs and gross profit are measured as a percentage of Gross Farm Income. Based on figures available from the New Zealand farm sector Tom Phillips believes farmers should set the following targets:

    - Variable costs should not exceed 35-45% of Gross Farm Income
    - Fixed costs should not exceed 15-20% of Gross Farm Income
    - Leaving 35-50% as gross profit – minus personal drawings and tax

2. Within the New Zealand farming sector there is some debate about how many farmers actually carry out business performance monitoring. Commonly quoted figures at the end of 2012 were indicating that 3 or 4 out of 10 farm businesses employed KPIs to any degree. Latest figures (July 2013) suggest the figure is now somewhere nearer to 50% of farm businesses monitoring performance. Two reasons are given for the recent increase:

    - Farmers are now using performance monitoring as a part of risk management within their businesses.
    - With the increased levels of indebtedness, banks and other financial institutions are making performance monitoring mandatory.

3. Gender does not play a part in New Zealand agriculture. An Extension Officer from Dairy NZ told me – "you phone a farming business - a female answers - you do not automatically assume that the wife/partner knows nothing about the business. The wife/partner could in fact be the *main decision maker* within the business!" This statement highlights the fact that it is not necessarily the eldest male child that gets the farm! Progressive farmers in New Zealand want the child with the best skills set to take over the business. Essentially **first son gets all** is a "last will and testament" that is heading for the courts!

4. "Young people in New Zealand actually want to farm!" Dairy NZ recently ran a course designed to train new staff to work for the *industry good* levy body. Twenty out of twenty three of these young people actually ended up farming in their own right!

5. Education is key to the future of agriculture. A recent statistic suggested that a young person with a university education who was given control of a farming business early in life would run a business that was 20 % more profitable than that of their peers. The key points being: they had the business skills, they had control of the business and they made their own mistakes.

6. New Zealand is experiencing increasing levels of environmental constraints and regulations especially within the dairy sector. Derek Daniell, who owns the famous Wairere sheep station near the bottom of the North

Island said: *"you can't do green if you're in the red."* What did he mean? That essentially a farm business must be profitable to be able to carry out environmental enhancements and comply with the increasing regulatory burden.

5f. New Zealand conclusions

In regard to New Zealand and the business of farming, my conclusions are as follows:

- Agriculture plays a vital role in the economy of New Zealand
- Because 80% of the food produced in the country has to be exported there is a very strong market focus.
- Young people (both males and females) want to become involved in farming in New Zealand
- Education to degree level coupled with a person having early control of a farming business will generally lead to a more profitable enterprise
- Strategic planning is a vital exercise for all farm businesses
- Approximately half of New Zealand farmers carry out business performance monitoring
- KPI monitoring is easier within the dairy sector – regular well documented sales etc. Five out of 10 NZ dairy farms do KPIs, which is more than any other farming sector (2 out of 10).
- Balanced Score Cards, S.M.A.R.T. planning and assessing variable costs, fixed costs and gross farm profit as a percentage of Gross Farm Income are important tools used on New Zealand farms.

Derek Daniell - on top of Wairire

6. The business of farming – the Australian way

6a. Introduction

My Scholarship tour in Australia lasted almost three weeks. Almost half that time was spent in Western Australia. Esperance, the Wongan Hills Northern wheat belt area, and Perth were the three geographical areas visited.

South Australia was my next destination. During my stay in the region I visited the beautiful Clare Valley and the area around Loxton.

Finally, before re-joining my family in Queensland for Christmas, I spent a couple of days south of Melbourne in Victoria State.

6b. Continuous Improvement and Innovation

During a series of meetings at the Western Australian Agricultural Department the subject of Continuous Improvement and Innovation (C.I. and I.) was raised. First developed in Japan in the 1940s the process was used, in the early years, in most industries, except agriculture. Since the 1990s the model has been used in the agricultural sector globally. Australia, New Zealand, the United States and South Africa are locations where farmers have used the process. Beef, wool, cotton, dairy and pig producers have all applied the principles to their business units. Pasture and crop management farming as well as a range of other agricultural related companies and organisations have used the process.

A two paragraph story helped to introduce the idea to me. It read :

"Two woodsmen enter the forest each day to cut wood for their village. Each returned at the end of the day with the same amount of wood. The first woodsman could not figure out why this was so! He had worked all day without a break. The other guy, he had noticed, took regular breaks.

One man asked the other how this was achieved - having breaks, yet still chopping the same amount of timber. The answer – ten minute breaks were taken to refresh his mind and his muscles! He also occasionally sharpened his axe!"

Continuous Improvement and Innovation is primarily a "thinking process." People who practise the art realise the importance that thinking plays in achieving improvement and innovation. C.I. and I. has been given many different names over the years. The important point to remember: this is a logical thinking process. As long as the steps outlined in the process are carried out the results will be rewarding!

C.I. and I. is not just about thinking. ***Focusing***, ***thinking*** and **action** are all key aspects. Someone said: *"We can think as much as we like, but if we don't take action, nothing happens!"*

So what is this *focusing*, *thinking* and *action* supposed to achieve? Practitioners of the art indicate the following six achievements -

- more improvements and innovations
- faster improvements and innovations
- proof of improvements and innovations
- confidence about how and why improvements and innovations were achieved

- skills and confidence to continue to achieve improvements and innovations in the future
- satisfaction and enjoyment from using the process and achieving rewarding results.

So what is this "logical sequence of steps" that when completed, make up the C.I. and I. process? There are seven steps in the process. These are:

1. **Focus** by setting goals and boundaries.

2. **Situation analysis.**

3. **Impact analysis.**

4. **Action design.**

5. **Action implementation**

6. **Results assessment.**

7. **Creation and synthesis.**

The C.I. and I. process gives the illustration. **See Fig.5 on next page.**

Once the "process" has been completed - and assuming improvements have been achieved - a buildup of momentum leads to a refocus. More new business goals and objectives are established and so the process starts again!

This report will now illustrate, in outline form, an example of how the C.I. and I process can be applied at farm business level. Time and space within this Nuffield report does not permit a comprehensive explanation. Within each of the seven steps, techniques and business management processes and tools are used. These will merely be mentioned in the report. Fuller explanations are available outwith this report.

6b.i. Step One – Focus – what tools are required to develop good goals?

- S.M.A.R.T. planning
- Vision, Mission and Goal Setting
- Priority Goal setting
- Target Setting
- Balanced Score Card

The five listed above are some of the tools and techniques that can be used as part of Step One. The aim of this first step is: *to develop good goals for the business*.

On farm example of the process: S.M.A.R.T. planning has been used to develop a good goal for the business. The goal is "to achieve a 5% improvement in the Gross Margin of our beef enterprise within 12 months"

6b.ii. Step Two – Situation analysis – what opportunities are there to achieve the 5% improvement?

- Brain-Storming
- Plus: Minus: Ideas (PMI)
- S.W.O.T. Analysis
- Specialist Questioning

These four tools are some of the methods used to *"generate ideas and opportunities – **without constraints**"* - as to how the business goals can be achieved.

On farm example – Brainstorming has been used to identify the following opportunities, which could achieve the goal of a 5% improvement in the Gross Margin of a beef enterprise:

1. Increase calving %
2. Increase average growth rate
3. Decrease average variable costs
4. Increase price through vertical integration in supply chain
5. Sack the Prime Minister and get a fixed price

See C.I. & I. Step Two on next page

Fig. 5: The C.I & I process Step One

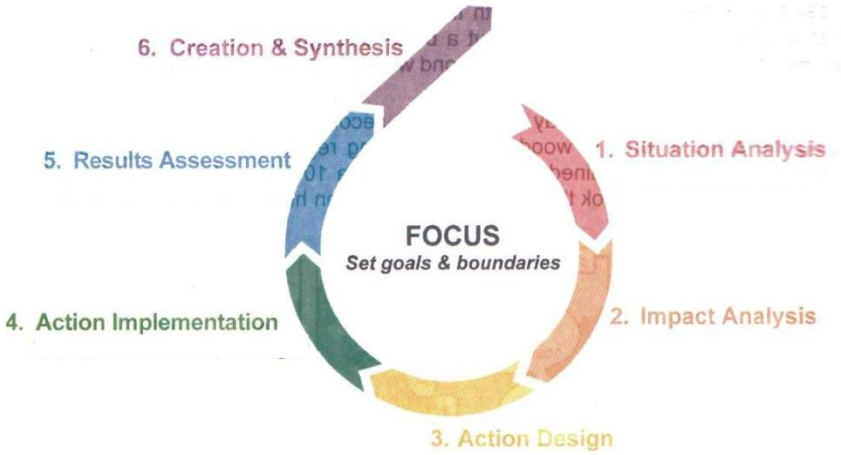


Fig. 6: The C.I. & I process Step Two

6b.iii. Step three – Impact analysis – what option, of these five, will best achieve the desired 5% improvement in Gross Margin?

- Impact and Influence
- 8 Criteria
- Gross Margin
- Return on Investment
- Priority setting

The tools just listed are some of those appropriate for use during this part of the process. Step three is best illustrated by using the next three diagrams.

Figure 7 illustrates the" Impact and Influence" and how which of the five options are likely to achieve the desired business improvement.

See Fig. 7 on next page

Figure 8 outlines the fact that the focus needs to be on high impact and high influence when deciding which options to consider.

See Fig. 8 on next page

Figure 9 plots the scores on the Impact and Influence graph. When average scores are plotted option 1 and option 2 are the only two that are placed in the high impact, high influence quadrant. As a result options one and two will be further considered. The remaining three are no longer in play.

See Fig. 9 on next page

6b.iv. Step four – Action design

During step four the focus is on designing a programme of actions that will implement the change necessary to achieve the desired business goals. Four possible aids in this part of the process are:

- 5 Ws and 1 H
- Action design
- Trial and control
- CSFs: KPIs and KPIs Framework

To take the "**5 Ws** and **1 H"** as an example, how this model is implemented is outlined below:

- **W**hy – the needs and opportunities, and the links to the goals
- **W**hat – S.M.A.R.T. goals/Target outcomes of the Action Plan
- **H**ow – necessary actions, activities, tools and technologies to achieve the Target Outcomes
- **W**ho – roles, responsibilities, support and resources to achieve the desired results
- **W**here – location/s of key actions and activities
- **W**hen – realistic times, timing and timelines for each step and stage

Key point – the S.M.A.R.T business goal of "**a 5% improvement in the Gross Margin of the beef enterprise within 12 months"** MUST BE CONNECTED to the Action focus.

See Fig. 10 two pages ahead

Farmer example of an action focus = to achieve an improvement in average annual growth rate from 120 kg/head to 190 kg/head within three years. These two aspects must be linked for the C.I. and I process to be effective.

Figure 11 provides the illustration as to how the factors which make up the Action Design stage of the process are brought together.
Key actions:

- **H**ow, KPIs - the key factors :
- **W**ho – the key people :
- **R**esources – the key essentials and timescale
- the key timelines are all brought together within this chart.

See Fig. 11 two pages ahead

Figures 7, 8 and 9: The C.I. & I. process Step Three

Step 3 – Select Best Options – *Farmer Example*

Impact & Influence Tool

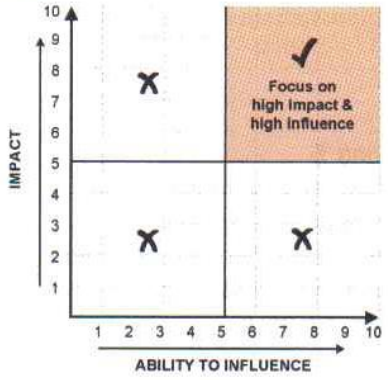
Focus:-

Opportunity	Impact (1-10)	Influence (1-10)
1. Increase calving %	9	9
2. Increase average growth rate	8	8
3. Decrease average variable costs	4	8
4. Increase price – vertical integration	4	4
5. Get rid of PM – get fixed price	10	1

Step 3 – Select Best Options – *Farmer Example*

Impact & Influence Tool

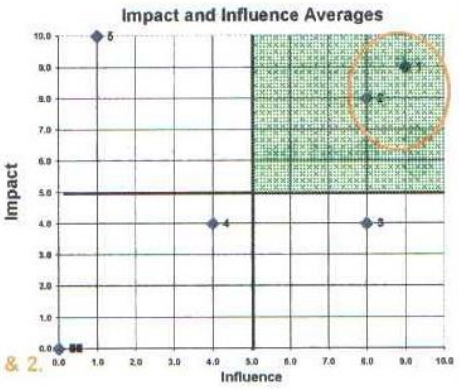
Plot the scores



Step 3 – Select Best Options – *Farmer Example*

Plot the scores

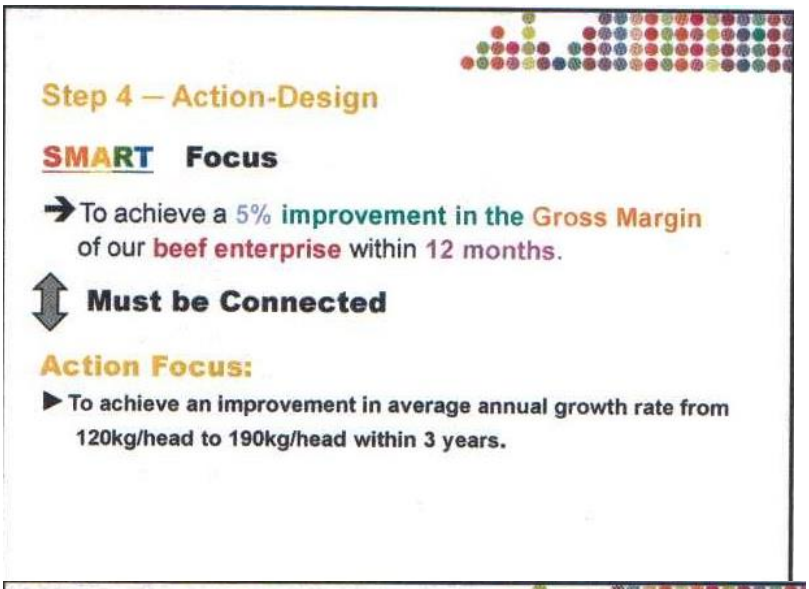
1. ↑ calving %
2. ↑ growth rate
3. ↓ variable costs
4. ↑ price – vert. integration
5. Get rid of PM – fix price

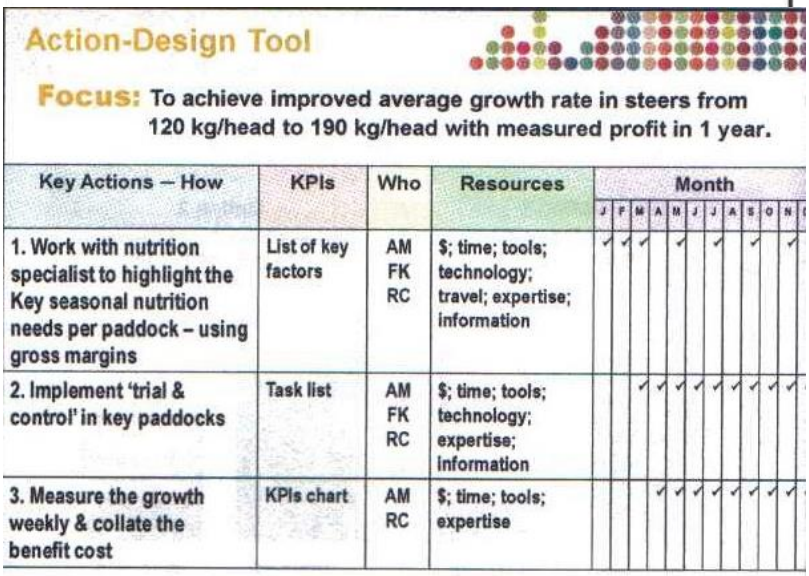


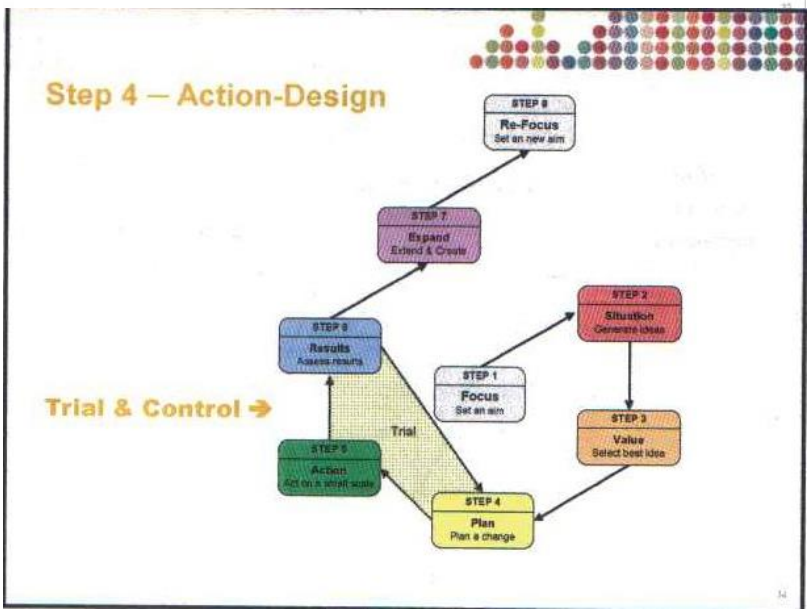
Further consideration for 1 & 2.

Leave 3, 4 & 5 behind

Figures 10, 11 & 12 : The C.I. & I. process Step Four







Within the Continuous Improvement and Innovation process there is scope for both full and partial implementation. If a business manager decides to implement a "trial and control" process within key parts of the business that is acceptable. Figure 12 provides the detail on information flows within the "trial" process.

See Fig. 12 on previous page: C.I. & I. Step Four

6b.v. Step five – Action Implementation

As part of the action implementation phase, the factors throughout the previous facets of the C.I. and I process are all drawn together. Focus on the business has identified key goals and boundaries; ideas and opportunities have been generated – without constraints: options that will best achieve desired outcomes have been identified and a programme of actions has been formulated.

From this point comes the "action on the ground" within the business.

Key questions at this stage of the process are:

- is the action plan proceeding as expected?

Followed by -

- if not, why not?
- are the measurements starting to indicate any changes?

Some of the professional tools and tactics available to measure how the action implementation phase is progressing are:

- Action checklist – Timeline
- Measurement check
- Learning-Log
- Reporting for Support
- Critical Friend

Figure 13 on next page describes how key actions, key performance indicators, key people, key resources and key timelines are monitored and recorded during this phase of the process. In terms of the farmer example the focus remains – to achieve improved average growth rates in steers from 120 kg/head to 190 kg/head, measuring the profit in one year.

See Fig. 13 on next page: C.I. & I. Step Five

6b.vi. Step six – Results assessment

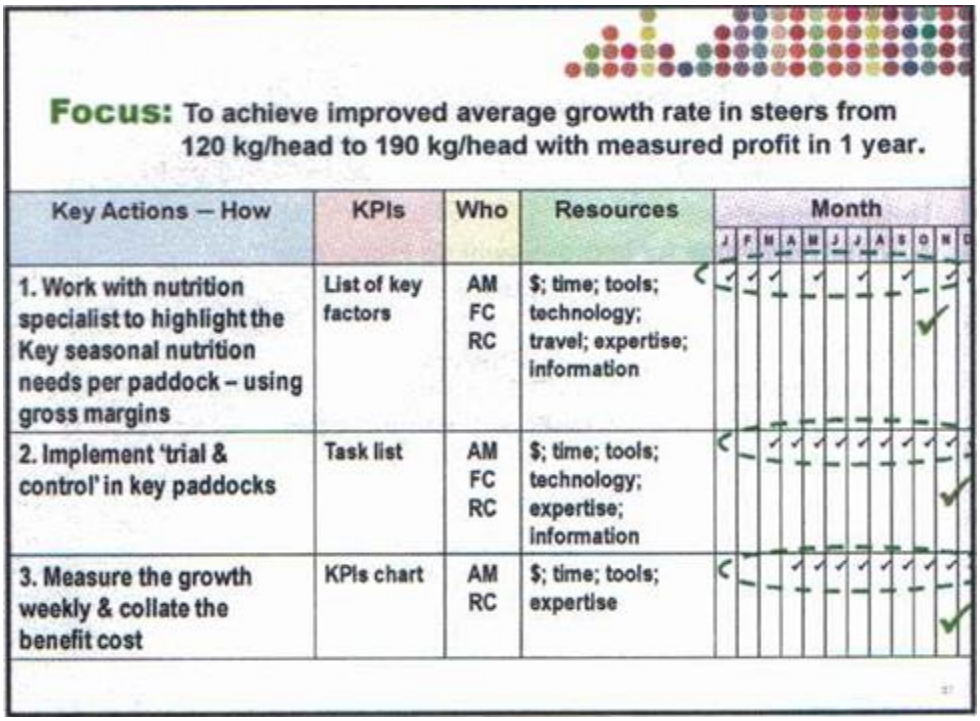
During this phase the results of the change are assessed. Assessing the results of the option implemented as part of the process is important for several reasons. These are:

- to assess the actual impact achieved relative to our focus.
- to find out what worked well, and what didn't achieve the targeted results.
- to find out the efficiency with which these results were achieved.
- to assess performance in relation to minimising total use of inputs and to find out whether any unexpected effects were produced. These could be additional benefits or innovations or direct or indirect negative effects.

Without effective results assessment we:

- don't know to what extent the option we implemented contributed to our focus
- don't know whether the option performed better or worse than what was expected given the Impact Analysis
- don't know whether implementation was effective or efficient.

Fig. 13 : The C.I. & I. process Step Five



Focus: To achieve improved average growth rate in steers from 120 kg/head to 190 kg/head with measured profit in 1 year.

Key Actions – How	KPIs	Who	Resources	Month
1. Work with nutrition specialist to highlight the Key seasonal nutrition needs per paddock – using gross margins	List of key factors	AM FC RC	$; time; tools; technology; travel; expertise; information	
2. Implement 'trial & control' in key paddocks	Task list	AM FC RC	$; time; tools; technology; expertise; information	
3. Measure the growth weekly & collate the benefit cost	KPIs chart	AM RC	$; time; tools; expertise	

- also we don't know whether to continue with the option, expand its implementation or stop doing it, and we don't have any lessons or learning for how future implementation could be improved.

Key message – effective results assessment is critical. Even if results are negative - or not as good as hoped for - the important thing is **to learn** from the results assessment phase. There is, practitioners suggest, even a name for this type of thing – it's called **intelligent failure**!

This assessment can be carried out using some, or all, of the following tools:

- Results (targets) and tasks achieved and not achieved – checklist
- Measures achieved
- Key reasons for results
- Learning log
- C.I. and I. Thinking and Support.

The Results Assessment phase is not complete until answers are available to these two questions:

1. What are the overall results from implementation?
2. Given the goals, is the option worth continuing or expanding? Put another way, were the improved growth rates in the farmer example achieved? Was the 5% increase in the gross margin of the beef enterprise achieved?

During this step of the process there is always the risk of "analysis paralysis" developing. To prevent a business owner getting bogged down at this point there must be a confident answer available for question two.

If a few useful lessons have been learned during the process there will be the confidence to move to the next phase.

6b.vii. Step seven – creation and synthesis

This seventh step is integral to the C.I. and I. process because achieving improvement requires new thinking. Innovation depends on the generation of new ideas, new questions and new opportunities. The idea of this step is to stimulate participants to:

- do creative thinking – think things never thought before, so that possibly things never done before can be done.
- do synthesis thinking – essentially stop *analysing* things in greater and greater detail – instead take a step back, look for larger patterns and insights to enable a manager to perhaps begin to see ways to do those things previously thought impossible.

Without effective Creation and Synthesis the momentum generated from achieving rewarding results is lost. Idea creation, as a means of business improvement is stifled. A business owner will get caught *"thinking inside the box"* essentially doing what they have always done! The result - getting what they have always got!

A range of tools that are helpful during the Creation and Synthesis process are –

- Six Thinking Hats
- Inverse thinking
- Brainstorming
- Why – why diagram
- Observations, questions, ideas and opportunities (OQIO) framework

Step seven is incomplete until a couple of questions have been answered. Namely what new ideas or opportunities for improvement have been identified? Secondly, is the business owner thinking "outside the square" and who can help? In the context of the farmer example, with the 5% increase in gross margin achieved, what are the next potential business goals? Has implementing the C.I. & I. process identified any innovation moving the business to yet newer levels of achievement?

On completion of this step the participant is encouraged to re-engage with the process: to complete the business focus, beginning with the new ideas and opportunities outlined in the previous paragraph and so the cycle will begin all over again.

A few tips from people starting out on the Continuous Improvement and Innovation journey would be –

- for the first six months choose options that focus on short term goals e.g. improving day-to-day or seasonal operations
- have at least one improvement project operational at any one time
- encourage everyone in the business to become involved in the improvement work
- do C.I. and I. in a group with other partners because you get double the benefit
- it takes one to two years to get really comfortable and confident using the C.I. and I. process and tools

Included in **Appendix One** (at the end of this report) at **Table One** are a series of questions designed to keep the C.I. and I. process on track. For each step of the process there are questions that help focus thinking and action and achieve success more efficiently.

By way of conclusion to this part of this chapter of this Nuffield report, when making mention of Continuous Improvement and Innovation six key messages bear repetition. They are:

- "Start with the end in mind" - stay focused on desired outcomes
- Cover all the steps
- Make the time - allocate 5-10 % per week/month/year
- Schedule regular and frequent cycles: 30: 90: 180: 360 days
- Use appropriate tools at each step
- Identify key performance indicators - KPIs

Continuous Improvement and Innovation (C.I.and I.) is a proven way to Achieve Improvements for Individuals, Businesses, Industries and Regions.

6c. CBH Co-op Western Australia

The Co-operative Bulk Handling Co-op (CBH Group) was formed in 1933 at the height of the "Great Depression". A group of arable farmers had seen their livelihoods threatened by poor harvests and low grain prices. Wheat growing had reached a point where it was hardly worth harvesting. Something had to be done! CBH was formed on 1st April, 1933. That first year just over forty two thousand tonnes of wheat were received off farm through the co-op.

The co-op was formed on an "equal share" basis. Essentially all farmer members, irrespective of acreage grown or tonnes produced, have shares valued at $2 Aus. dollars. Initially CBH was only involved in receiving grain off farm and providing the storage and distribution infrastructure. This all changed in 2002.

See CBH Group logo on next page

That year saw the merger of CBH with another farmer owned organisation in W.A. - The Grain Pool of Western Australia - a grain marketing organisation. With this move the co-op was transformed into an integrated grain handling and marketing business.

Since 2002 the main focus of CBH Group has been to deliver growers a greater share of the grain value chain. An example is several strategic investments along the value chain including the Interflour Group milling joint venture in South East Asia.

As of September 2011 the CBH Group had 4,500 farmer members with net assets of $1.5 billion Aus. The annual turnover of the Group exceeds $1.5 billion Aus. The Group is in the top 20 companies in Western Australia by revenue. CBH Group is the largest co-op in W.A. as well as being the only major participant in the Australian grain industry still owned by farmers.

Other key facts are: 1) approximately 1,000 regular staff are employed. 2) an additional 1,500 casual staff assist at the grain receiving points during harvest. 3) the Group has 197 grain receiving points throughout W.A. 4) there are four export terminals to service the overseas trade.

It is important to note that grain grown in W.A. is exported to over 20 countries globally. These include Japan, South Korea, Indonesia, Iran, Pakistan and China.

Harvest 2003/04 was a record harvest in Western Australia. Over 14,000,000 tonnes of grain were produced within the State that year. CBH group will, during an average harvest, receive around 10,000,000 tonnes.

Currently the core activities of the Co-op are:

- Grain storage
- Grain handling and transport
- Grain marketing
- Grain processing
- Grain shipping

Because of the extensive infrastructure controlled by CBH, grain farmers have

Farmer Co-operative in Western Australia

Paddock-side grain testing lab Western Australia

increased harvest capacity. Grain is tested at the paddock gate.

See picture of paddock-side grain testing lab on previous page

Assuming the specification meets the predetermined standards, the grain immediately leaves the farm bound for one of the almost 200 receiving points.

The farmer member then has two choices, he can either –

- Market the grain him or herself. CBH Group will then do the batching and dispersal of the grain.
- Leave the marketing, batching and dispersal all to the CBH Group.

The co-op markets around 6,000,000 tonnes of grain annually. The aim is to supply premium quality grain to major global markets.

Having given a brief history of the Group, and an outline of current operations, one service performed by the co-op merits greater explanation.

Daily Grain is an online price discovery and marketing service. Formed by a group within the grain industry, the service is now wholly owned by the CBH Group. Growers, consultants and grain buyers avail themselves of the service.

Daily Grain's aim is to provide growers with correct and up-to-date information on grain prices. This will enable users to make better decisions for their businesses.

How it works –

- Marketers' live prices for grain are monitored and compared every day of the year.
- Wheat, barley, canola, lupins and oats are included in the process.
- Prices are then adjusted to allow for differences in delivery location, grain specification and quality premiums.
- Growers and other users can quickly and easily compare prices in the knowledge that "like for like" comparisons are being made.

Users of the Daily Grain service are sent the top five cash prices for grain via email and SMS by 11 a m each weekday. Live pricing is available at any time on the Daily Grain website and via a mobile phone app.

Additionally an online calculator allows users to input their individual load details including variety, grade and quality specifications. This enables subscribers to view the best prices - both cash and grain pool - that are available to them for their particular batch of grain.

6d. Bullaburra

During my visit to South Australia I met two neighbouring farmers just outside a town called Loxton. They were John Gladigau and Robin Schaefer. In 2007 John asked himself the question "*Where will I be in ten years' time - will I own my neighbour's farm … or will he own mine?*" At that time he had just completed a Nuffield Farming Scholarship during which he studied "Collaborative farming to survive and thrive".

Six key principles had become apparent, during his Scholarship tour, if collaborative farming was to be successful. These principles were:

- Agricultural business ventures need to be structured in such a way that they can be scrutinised alongside other industry and investment sectors.

- Businesses need to be able to differentiate between real estate (land and property) and agri-business (farming) and, if necessary, separate the two for maximum performance.
- There are no set rules on how a business model can be set up, beyond the laws and regulations by which they are governed.
- All collaborative ventures need to be set up with the notion of "win-win" firmly in mind.
- Successful large scale businesses create cells of optimum efficiency and profitability and then replicate them.
- The two greatest threats to the success of any collaborative venture are emotions and the personalities of the parties involved.

Discovery of these principles coincided with John and Robin each taking a critical look at their business units. Both recognised that their enterprises could not survive in their current state.

At that point John shared a labour unit with another neighbour. The worker spent one week with John and the next week with the other person. This system worked very well for John and was the first tentative step toward collaborative farming.

By mid-2005 the Schaefer business, in addition to arable and livestock farming, was exporting native flowers to Japan. Property development had also become an integral part of the business. Two years later drought, combined with an Australian dollar increasing in value (50- 90 cent increase) had severely curtailed both of these ventures. This convinced Robin Schaefer that his business was "over capitalised" in terms of machinery and change must happen.

By 2007 both men were talking seriously about forming a collaborative farming business. The main focus was centred around increasing the efficiency of such a business without buying more land. Essentially: how could they acquire control of the acres and match the total farmed area to the optimum level of mechanisation? Collaborative farming was on its way to Loxton, South Australia.

The first step occurred for harvest 2007 when both existing combine harvesters were operated together. With harvest safely completed the second step was to look at the machinery inventory currently held within the business. This was done alongside step three - taking the decision as to the target acreage to be farmed by the business. They asked the question: what is the potential to increase the farmed area?

Matching the acreage to the machinery led to the following sales and purchases, step four –

- Two main tractors were purchased
- Two original sprayers were sold and a large one purchased
- One small seed drill was sold and a new one purchased to match an existing one
- A new combine and a chaser bin were purchased
- Existing tractors were sold. An existing combine was disposed of.

At the conclusion of this process each partner had identical machinery inventories. The farming partnership, not them as individuals, had control of all the machinery.

In year one, step five of the process, each partner planted and paid for their own crop establishment. Each had five thousand acres at that point. This represented the "injection of capital" by both parties into the new partnership.

This money was realised (lodged) in the partnership bank account at the mid-point in that growing season when all the standing crops of grain were sold to the new company.

The partnership is overseen by a board of directors. The two partners, an independent chairperson and the farm manager (non-voting) constitute the membership. Currently there are four full-time staff members, including Robin who is general manager, one part-time staffer and two or three casuals for planting and harvesting times. In addition John works part-time, on an as-and-when-required basis within the company. Each partner is "paid the going rate" as salaried staff members.

Currently 30,000 acres are farmed by the partnership. A portion is leased, a portion is contract farmed and a portion is owned by the partners. Two points are important to note about the owned land:

- All land is owned by family trusts
- The land is leased into the farming partnership

In geographical terms the partnership farms land which is spread, from corner to corner, around 60 kilometres in distance. 23,000 acres of arable crops are grown with 7,000 acres of pasture land also farmed.

Wheat is the dominant crop produced within this business accounting for three quarters of the arable area. A portion, 2,500 acres, of canola (oilseed rape) and a similar area of barley is also grown. A very small area, 500 acres, of grain legumes is also grown. Wheat makes up the remainder.

Both partners are very business orientated. Business reporting is seen as key to the success of this venture. Gross margin analysis is completed for every paddock (field) and for every crop. For example profitability of a crop or paddock can be viewed by sowing date. According to Robin the independent chairman of the board "keeps you figures-orientated." In reality when the board sets cash flow targets - all within the business must stick to them!

Benchmarking within the Australian arable sector would suggest that the businesses that had higher levels of machinery efficiency were the best performing overall units. As previously mentioned, a key problem within the Schaefer business, prior to the formation of the partnership, was "over capitalisation" of machinery. Essentially too much expensive machinery not working hard enough! Four years on - considerable change has happened!

Most machinery and equipment, apart from the tractors, is never owned outright by the business. Leasing and/or hire purchase is preferred to outright cash purchases. Machinery is renewed and updated on a regular basis with the finance payments being rolled over into the next machine. Newer machines bring greater reliability and the potential to cover optimum acreages. This is critical given the close relationship between total acreages and machinery capacity on the farm.

Soils in this region are very alkaline in Ph terms. They range from 7.5- 8.5 on this farm. Within some paddocks levels of Ph 9 and above have been detected. At this level wheat can start to struggle. Phosphate "lock-up" also becomes an issue at these levels.

Moisture conservation is a key aim within this business. At crop establishment, every effort is made to minimise soil movement. The more soil movement occurs the more moisture evaporates. Minimum tillage using two John Deere seeders operates on this farm to establish the arable crops.

Each one plants 300 ha (740 acres) during each 24-hour period. One "soil engaging" tine places three different products in the seedbed. Urea is placed through the most forward pipe to a depth of 4-5 inches. The seed and DAP Phosphate are then placed behind and slightly above the Urea. A "press wheel" follows immediately behind to firm the seedbed.

Soil conditions do not dictate when crops are sown, calendar date does. Moisture conservation and frost risk are the two main causes of concern. Crop establishment happens in the following sequence:

- Mid April – canola (oil seed rape) sown
- 20th April – begin sowing barley. To sow barley any earlier would increase the potential for late frost damage
- 24th April – begin sowing wheat. Frost risk as with barley.

One startling fact – **in the past wheat crops have germinated and survived for up to six weeks on 3.5 mm of soil moisture on this farm!**

Five year average yields for this farming business are as follows –

- Wheat: 1.4 tonnes per hectare
- Barley: 1.4 tonnes per hectare
- Canola: 0.6 tonnes per hectare

The question is: now that four harvests have been completed how has the collaborative farming venture performed? Improvements in profitability have been seen over the last four years. 2009 turned a modest profit. 2010 was the best year. Ever! Good yields and high grain prices gave that result. 2011 ended as a loss-making year.

At the time of my visit the 2012 harvest was completed. Despite the growing season in 2012 being equal to the third driest on record (104 years) wheat yields were 1.15 tonnes per hectare, barley did 1.6 tonnes per hectare and canola yielded 0.5 tonnes per hectare. Despite the very dry year the business turned a small profit in 2012.

Overall the partnership has been successful. With four of the five years' commitment completed each partner has committed to another 5-year agreement.

A final thought from Robin Schaefer – a key requirement to ensure successful collaborative farming ventures – **"always have an exit strategy"**

6e. Risk management

Definition of risk management : the process of measuring or assessing risk and then developing strategies to manage that risk.

The region around Loxton, South Australia, must have one of the lowest average rainfalls of any of the world's wheat growing areas. In some years there can be as little as 3.5" (80 mm) of rain during the growing season. Figures for 2012 indicate total rainfall of 6.5" (162 mm) from January through to September. These extreme climatic conditions highlight another important issue for the Bullaburra business - managing risk.

Risk management is said to be a five step process:

- Identify, characterise threats
- Assess the vulnerability of critical assets to specific threats
- Determine the risk i.e. the expected likelihood and consequences of specific types of attack on specific assets
- Identify ways to reduce those risks
- Prioritise risk reduction measures based on a strategy

Schaefer and Gladigau are adamant that farmers must understand the concept of risk. More than that, they must understand what the "real and actual" risks are. Schaefer says "Drought is the biggest risk to this business." Essentially the more reliable the production area the less the risk will be. Drought areas will always equal higher risk.

High risk always has the potential to equal high reward. Given that, it is no surprise that benchmarking figures throughout Australia indicate that this region has the highest potential return on investment of anywhere in the country.

All efforts must be made to mitigate or reduce risk. At Bullaburra the following measures have been implemented –

- A min-till direct drill establishment system
- Minimising the area of risky crops e.g. peas, canola and vetches
- Maximising the area of less risky crops e.g. wheat
- Growing a range of different varieties of crop e.g. wheat

To conclude, management of risk is an important activity for farmers in South Australia. The management task facing all farmers is to choose a combination of strategies that best suits the unique conditions of their particular farm and personal circumstances.

6f. Esperence

Esperence is a region in the south west of Western Australia. A coastal region, it is a 1.5 hour plane ride from Perth (8 hours by car). Agriculture, tourism and shipping are the main economic drivers within the region.

The agricultural area measures 300 km (160 miles) long by 150 Km (80 miles) wide; perhaps similar in size to Northern Ireland or Yorkshire. Two things about agriculture in this region amazed me:

- Up until the mid 1960s the area now farmed was all scrub and bush land.
- There are only 500-600 farm businesses in the region.

American investment alongside W.A. Government aid funded the bush clearances 50 years ago. The bush clearances occurred when it was realised that, by adding "super phosphate" including trace elements, the "plain sand" could be made suitable for crop and pasture farming. Residents who remember the clearances speak of massive stacks of timber and scrub being burned. Must have been quite a fire!

The first landowners way back then employed other, later-arriving farmers to assist with the clearances. This gave the second wave the "financial means" to purchase property themselves. As a result all the farmers in the region are second generation producers. Evidence would suggest that very few original owners are still farming in the region today. Indeed, on one 130 km stretch of one road, only two of the original farm families are still farming.

The Fowler family farm 90 kms east of Esperence town near a small settlement called Condicup. Andrew Fowler, two brothers and their father currently farm 25,000 hectares. 10,000 hectares are owned, the remainder being farmed under 5 year lease or share farming agreements.

See the Fowler farm sign on next page

Within the Fowler business just over 16,000 hectares are dedicated to crop farming with the remainder being under grass. The combination of cropping and pasture is an important aspect of this farming operation. Conserving moisture and building fertility are

The Fowler business - Esperance, Western Australia

two vital benefits of having the "corn and horn" combination on the farm.

Some other key farm facts:

- The farm employs 11 permanent staff plus seven or eight temporary staff for seeding and harvest.
- 2,500 beef cows plus 25,000 ewes are kept on the farm.
- 5 year average rainfall on the farm is 450-460 mm (18 inches)
- 5 year average grain yields: a) wheat is 3.5 tonnes per hectare. b) canola is 1.8 tonnes per hectare.

This business has expanded rapidly during the last two decades. Several factors have contributed to this. These factors are:

1. Rotation and mixed farming
2. Adoption of min and no-till establishment techniques
3. Increased capacity for harvesting

1. The ability to grow wheat and oilseed rape in a rotation that also includes "subterranean clover" has made it easier to produce grain and meat from the same farm business. Within this region subterranean clover reseeds annually. Being a clover the plant is able to *fix* nitrogen. When a paddock is in the livestock phase of the rotation the clover provides the grazing material for the livestock. During the arable phase the clover is allowed to germinate, fix the nitrogen and is then chemically killed off. The nitrogen is already in the soil and, when the mulch remaining from the dead plant is incorporated, the soil structure

benefits. What could be simpler?

2. Min-till and no-till crop establishment techniques came to this region in the 1990s. Following years of conventional ploughing and sowing cultivation and with "dust storms" increasing in frequency, something had to be done. To do nothing would have risked the creation of a "dust bowl." The new cultivation techniques were the necessary response to this situation.

3. Harvest was in full swing during my visit to this farm. Four huge New Holland combines were operating to full capacity that day. Each was capable of harvesting 90 hectares per day! Harvesting grain at 13% moisture is common in this region. Thirteen per cent was the wettest recorded during my stay! Not a grain dryer in sight! All grain was tested at the paddock (field) gate. Assuming quality specifications were met, the grain was loaded onto "wagon train" lorries, each capable of carrying 78 tonnes, and shipped off to the nearest CBH Group receiving point.

The Fowler business appears to be a well-run, profitable and dynamic business; 2012 wheat yields were averaging 3.5 tonnes per hectare and obtaining a price of $345 AUS dollars which left a gross output figure of $1207 dollars per hectare. Total fixed, variable and land costs - all included - per hectare for 2012 were $500 dollars. No wonder Andrew Fowler can say - "farming has never been better."

6g. Other relevant information

6g.i. Cornwell Business Report

When travelling in the Clare Valley district of South Australia I had the chance to visit the Cornwell family. The family, a husband and wife team, farm near a town called Hilltown in the mid north of South Australia. The business farms 1,663 hectares (4,100 acres) producing wheat, oats, canola, beans and lupins alongside Merino ewes and suckler cows.

The family merits a mention in this Nuffield report because of a document they gave me during the visit. The seventeen page "Cornwell Business Report" made for very interesting reading. Reason - every facet of the business was included within the paper: from detail on the management team, the enterprises, a property map, rainfall details, pest, disease and weed problems, cropping objectives, five-year average yield figures - through to debt structure and off farm income, finishing off with a detailed budget through to June 2013. All this information, and more, was laid out within the document.

Page 4 of the document included the **Business vision** and the **Business goals**. It read as follows:

Business vision – "Our vision is to operate a profitable farming business and achieve growth through investing profits in land purchases and off-farm investments to benefit us now and in the future."

Business goals:

- Make decisions based on business rather than an emotional basis.
- Optimise income through increased production by employing up-to-date technologies within agriculture.
- Keep abreast of business management through education and relationships with advisors
- Employ, where possible, from the local and rural community
- Develop, reward and retain our human resources

- Have a corporate social responsibility: to the environment by planting trees; and to the community through volunteer work.

6g.ii. Nixon Farming

Peter Nixon farms near Moora, two hours north of Perth in Western Australia. Ten thousand hectares are farmed in partnership with a silent partner. The Nixon family own 3,000 hectares, the other partner owns the remainder.

Peter believes there is some truth in the view that farmers have lost sight of both the consumer and of profit on the altar of "production, production, production." Because production boundaries have been pushed and pushed - always wanting higher yields etc. etc. - profit margins are now too tight. For example fertiliser prices seem to be based on what farmers can afford to pay!

Over-production of food in the Western world during the last 50 years, when combined with small returns on investment, have led Nixon to doubt whether, without radical change, farmers can produce the food required globally over the next 50 years.

He believes that "only a crisis will make people realise how fragile the world's food supply really is" adding that: "No-one has been able to tell me what a tonne of wheat is worth at minus ten days supply!"

In conversation mention was made of the recent sale of a Perth hotel. The 300 bed property was sold for $90 million AUS dollars. With $90 million Peter could "put together" a business that could feed one hundred thousand people. Up to one hundred families could be housed long-term within the same business. The question Peter has: "What does that purchase indicate society is saying about food production?" Answer: "Leisure is more important than food!"

Bring all these thoughts together and looking to the future Peter believes agriculture is at a very interesting juncture. Realism is the first step in being optimistic. In Australia there are two types of optimism 1) the "she'll be right type" and 2) the "analyse all the factors and form a strategy" type.

Looking to the future Peter Nixon believes there is a window of opportunity for farmers to set themselves up for much better returns. His best way of achieving this: "keep it simple and do plenty of it"

6g.iii. Brendon Tierney

Brendon Tierney, a farm consultant based north of Perth, had some interesting thoughts on farming and its future. A few are listed below –

- Farming and farmland as an investment class are totally outside any other investment class.
- The question must be asked : where is the next big jump in farm income coming from?
- "Farmers are an independent bunch of people who *like to work as a team* but *do* it **my way**"

For every one Australian dollar of **Gross Farm Income,** farmers in this region, according to Tierney, would have expected to spend:

1. 65 cents operating the farm
2. 25 cents on interest, finance costs and personal expenses
3. The balance (10%) going to pay tax, machinery replacement or debt reduction

With the yield and production increases that have occurred in agriculture in recent times,

combined with business units successfully "taking cost out", it has become increasingly difficult to meet the 65 cent limit.

Brendon describes profit as "a function of revenue minus cost" making the point that farmers are very production orientated, stating "Farmers will spend $2 dollars to increase production by $1". There is however a danger in not spending the dollar - sometimes! For example when machinery breaks down, some farmers will do anything to avoid expenditure. But when unreliable machinery breaks down - at harvest time for example - the cost can oftentimes be much higher than even the $2 dollars.

A final thought from Tierney – **Production is vanity, profit is sanity, cash flow is reality**

6h. Conclusions from Australia

Australia and the business of farming - my conclusions :

- Continuous Improvement and Innovation (C.I & I), the "thinking process" has huge potential to enhance and improve how farm businesses are managed.
- The CBH Group is a prime example of how a farmer-owned company plays a central role within the arable sector in Western Australia and indeed throughout the whole country.
- Daily Grains, the online price discovery and marketing service, performs the function of providing timely market intelligence.
- Bullaburra demonstrates collaborative farming at its very best – providing "win-win" solutions for all stakeholders.
- Businesses need to be able to differentiate between real estate (land and property) and agri-business (farming) and if necessary separate the two for maximum performance.
- Risk management for farm businesses is seen as a vital and necessary part of managing any farm business. This is especially so in regions where climatic extremes occur as they do in South and Western Australia.
- Farmers are still production-orientated rather than profit-focused.
- The importance of having a clear business vision and business goals is highlighted in the "Cornwell Business Report".

7. The business of farming : the South American way

7a. Introduction

South America was an interesting, informative and very enjoyable adventure. The three United Kingdom "amigos" - the Englishman, the Ulsterman and the Wildman - spent two weeks touring in three countries: Chile for seven days, Peru for three days and finishing off in Brazil for 4 days.

7b. Chile

Chile presents as a stable, well run, progressive country. Currently the economy has Triple "A" rating in terms of performance. Politically, a democratically elected government is in office. The "Index of Human Development" is a measure of how a country is progressing in the world. Gross Domestic Product (GDP) is apparently now seen as out-dated. Chile is up there with Norway in the top group of countries as measured by this new index.

Chile, during centuries of history, has been invaded, set free and invaded again. Too many people have treated the country badly over the years. The Chilean people are a very proud people although they are also a very quiet people. A strong class system operates throughout the country. People never move up or across the classes as this is not seen as acceptable. Index of Human Development stats indicate that only 1:10,000 Chilean people is categorised as RESILIENT.

Catalina Castro Crichton from the Chilean Ministry of Agriculture hosted a series of meetings for our group in the Ministry headquarters in Santiago. Agriculture in Chile is heavily labour intensive and therefore important from a social policy point of view. It makes only a modest contribution to the overall economy in terms of exports and earnings.

Figures in relation to numbers of farm businesses are difficult to find. One government estimate suggested there were 277,000 small farms in the country. By small they meant under 12 ha (30 acres) in size. Big issues for Chilean agriculture in the years ahead include:

- Average age of farmers is 55 years old. How to encourage young entrants is the question.
- Need to maximise production – the land capacity is there to produce more.
- Farm businesses need to become more efficient.

The dairy sector is a key driver within the agricultural economy. There are perhaps 20,000-30,000 dairy farms throughout Chile, of which :

1. 40% (12,000) are located in the two southern regions of the country.
2. 15% of the business units produce 85% of the milk in the country.

Recognising the issues and wanting to help has led the current government to put plans in place to rename the Agricultural Ministry as the Ministry "for" rather than "of" Agriculture. It might only be a name but the intention of really wanting to **help** the farmers appears to be there.

Key Performance Indicators (KPI) and *Knowledge Transfer* (KT) were discussed during the meetings. On *Key Performance Indicators* government opinion was that the dairy sector was the most advanced in terms

of using these as a means of business monitoring. The sheep sector appeared to have a lesser usage than the dairy sector. The beef sector, in general terms, was not clued into performance indicators at all.

A 5-year project on Knowledge Transfer is about to "go live" on farm in Chile. The aim is to have five thousand medium sized farm businesses involved in the project after five years. Building trust and confidence across all sectors of the food supply chain has proved difficult in the past. One aim of this KT project is to see this improve. Farmers see regard KT as troublesome and as a nuisance. Most potential benefits are obscured, in the minds of the farmers, by the perceived additional paperwork involved in doing Knowledge Transfer.

A comment was made that "the best farmers in Chile, in terms of doing knowledge transfer, are the farmers who have had another career. They apply the skills learnt in their previous career to their new farming enterprise!"

7c. Chilterra

Ricardo Rios lives and works in the southern part of Chile. Valdivia, two thirds the way down this long narrow country, is the main centre of population in this area. Ricardo married a farmer's daughter and, with a background in IT, had worked as a computer programmer for the best part of 20 years. That all changed when he met a group of farmers from New Zealand!

Chilterra – a joint venture between Ricardo and the Kiwi farmers, was formed a number of years ago. Meeting the right people has been key to what Ricardo has been able to achieve. Mike McBeath, a Scot, was the link

Ricardo Rios - innovator in Southern Chile

that brought the two parties together. Key facts about the business:

- Currently farming 8,750 acres
- Milking 4,500 cows
- Total of 10,000 head of cattle on farm at present
- Employing 110 people

How this company operates marks it out as unusual within the Chilean farming sector. Key differences are:

1. The business is not managed using a hierarchical system. Everyone is equal. The office receptionist could be in the milking shed the following week!
2. The company is managed as a matrix with each column headed by a hub with a knowledge base.
3. 90% of the people employed in the business are categorised as RESILIENT - way against the national trend.
4. Wage levels are well above anything else available in agriculture.

Chilterra was so named as a play on the names Chile and Fonterra. The idea was to immediately generate the concept of "milk from pasture" - the New Zealand system. The company specialises in buying unproductive land and bringing it back to production.

An aim of the business is to produce one kilo of milk solids per one kilo of liveweight per cow. "Ryegrass is a *solar collector*, the sun shines, the grass sucks up the energy – the cows graze the grass, get the energy to 4.5 megajoules, and produce the one kilo of dry matter."

Every time the milk price drops this business expands. Chilterra will buy the neighbours' cows and grow. Buying the cows is one thing, milking them is another! Ricardo takes the view that the only way to grow is to train the staff to do the job for you. The wrong thing for the owner or manager to say is "let me do it … or … I can do it better." Staff must be permitted to make mistakes and learn from them! To this end a file of fully illustrated cartoons, covering every aspect of milk production - the do's and the don'ts - is issued to every member of staff. A fascinating document!

Chile and New Zealand differ in many ways. In terms of agricultural infrastructure New Zealand has the dairy, fertiliser, beef and veterinary co-ops. Kiwi farmers own virtually everything throughout the production chain. Little or none of this infrastructure is in place in Chilean agriculture. Chilean farmers generally don't work together. Chilterra, as a company, are attempting change in this regard.

As well as milk production Chilterra does engineering: engineering on a large scale - manufacturing IKEA type "flat pack" milking sheds. Currently all production has been concentrated on the expansion within their own dairy business. Future plans would indicate a desire to manufacture to order for the Chilean market and for export.

The following quotes from Ricardo about various aspects of global agriculture bear repetition at this stage:

- In farming you are not addicted to a drug called a salary.
- In farming if you don't have a vested interest – it does not work.
- If you have a subsidy system – you need to be prepared to "dance around" the politicians to ensure income for the following year.
- Government and subsidies is what is holding back the UK farming industry.
- Agriculture needs to be better than an office job to encourage good people into the industry.
- An 80 hectare farm is like a beach house, not economic and not viable in the future.

The ethos of Chilterra is to be happy, friendly and to enjoy what they do. As Ricardo puts it: "we need to keep the balance – the triple bottom line – people, environment and shareholders – all happy".

To conclude this part of this report with a quote from Ricardo – "every day when you wake up you decide whether you want to live a happy or a negative life."

7c. Gloria – the dominant co-op in Peru

At the moment Peru has one of the strongest economies in South America. The mining sector - aluminium, copper and gold being the main commodities - has contributed to good economic growth. Democracy is firmly in place as a form of government within the country. A Socialist government is currently in power.

My 2012 UK Nuffield tour party spent three days in the country. Visits were centred around the capital Lima and focused on the dairy sector. A couple of visits merit a mention at this point in this report.

Gloria is the largest dairy company in Peru. Privately owned by two brothers, we were fortunate to meet one, Vito Rodriguez. Just over 6,000 farmers supply milk to his company. Given that there are 8,500 dairy farmers in Peru, this company has a dominant position in the dairy sector.

Average herd size (of these 6,000 farmers) is 50 cows. The largest supplier has 1,000 cows, the smallest – just one. Gloria collects milk from every one of these farmers. The company employs fifteen hundred people and apart from dairy transportation and processing other activities include:

- Supply of dairy genetics
- Supply of Alfa Laval dairy equipment
- Acts as a Bank to aid on-farm investment

The family that owns this company are well connected to the Peruvian Government. Family interests in cement manufacture and other industries make this "family business" the fourth largest in the country.

This company is clearly a key player within the dairy sector in Peru. Opinion appears divided as to whether the influence is positive or negative. For small farmers Gloria is seen as a "one stop shop" – taking their milk, supplying the milking equipment and funding farm development and expansion. The farmers' milk is processed, marketed, and the cheque is sent to them!

Larger, perhaps more influential, farmers don't quite see it that way. Let us hear from one now. "Gloria is in a battle with us, we hate them but we also need them! They spend much on subsidising the small farms…" so said Martin Caillaux Campbell. Set within a 16 hectare walled property the Campbell farm milked 600 cows on the outskirts of Lima. All feed is purchased and is sometimes hauled hundreds of kilometres to the cows. Because of the location of the business there is no alternative but to purchase all the feedstuff.

This farm is currently not making money. Milk price at the moment is 50 cents per litre. Seventy cents would be required for this business to be profitable. Two things to note: the family have other business and farming interests and within ten years the 16 hectare site will be worth considerable money for development - given the current expansion of Lima.

Martin Campbell's father was a previous Peruvian Minister of Agriculture. It was interesting to get a sense from Martin as to how Peruvian farmers thought and acted. The Peruvian people are a very proud and independent people. The farming community is, according to Martin, very individualistic - all wanting their own prices etc. Essentially, for farmers, past experiences of co-ops have not been good. Two further thoughts on Gloria:

- The processor, Gloria, has the power in the Peruvian dairy sector
- The close connection to government is an advantage to the company

Re small farmers, Campbell believes they are price takers and rarely, if ever, think about cost of production or profit. These producers border on having a "subsistence farming existence."

To conclude this part of the report, Martin Campbell believes that the prospects are good for Peruvian agriculture. As living standards rise the requirement for food will increase within Peru. There is obvious scope for increased production on this farm, not to mention the export opportunities that exist.

7d. Brazil

Brazil is a vast country with a population of 200,000,000 people. Economic performance is good at the moment with people enjoying a rising standard of living. The visit to Brazil lasted just under four days. Part of the time was spent touring the Amazon region in the north of the country. What an area – what a river! Awesome!

Time was limited in terms of focus on matters agricultural! Several dairy farms were visited in the region north of Rio. In terms of my Scholarship topic the "learning outcomes" from the visits were limited. Themes from Chile and Peru - namely numbers of small producers, little focus on costs and non-viable businesses - were also evident in Brazil.

An example - a university professor (who is also a farmer) that we met believes that only farmers who produce more than 500 litres of milk per day will survive in the long term. Eighty (80) per cent of producers in this region produce less than 50 litres per day!

Milk production in this region has declined in the last few years. To help off-set this decline the regional government recently introduced tax incentives. As a result many farmers are going back into milk production.

Most Brazilians (80% of the population) live in the cities - as also do most of the farmers. Someone said "Many people have an enterprise in the city and a farm in the country." This leads to a lack of focus on the farming enterprise.

The question was asked: "Do farmers co-operate in Brazil?" Answer - no, not really. However in the region north of Rio things may be changing. Nestlé, the international conglomerate, which has a strong presence in the Brazilian dairy sector, has recently signed an agreement with a co-operative to source milk supplies. The co-op has 1,600 farmer suppliers. It is early days for the arrangement and success levels remain to be seen.

7e. South American conclusions

The business of farming – my conclusions from South America:

- Social policy considerations rather than food security appear to be the priority in South America.
- Where one part of the production "value chain" is dominant or has a monopoly, other parts of the chain suffer and the full potential of the agricultural sector is not realised.
- Lack of an agricultural infrastructure almost always means that farmers are more individualistic. "Work as a team and do it my way" thinking is widespread in South America.
- It is an advantage for a farmer to have had another career before "going farming."

8. The business of farming in Northern Ireland

8a. Introduction

The agri-food sector is the largest employer within the Northern Irish economy. Close to 100,000 people are employed within the sector. Since the global financial crisis agri-food has been "the good news story" within that region's economy. The sector, across retail, processing and primary production, has led the economic recovery.

Within the primary production sector there are just over 24,000 businesses registered for Single Farm Payment (SFP). Just over 1,000,000 hectares of land is farmed. There are three land types or classifications: Lowland, Disadvantaged and Severely Disadvantaged. Two facts are worthy of note:

- 40 hectares (100 acres) was the average farm size in 2010
- Up to 30-35% of land in Northern Ireland is farmed under eleven month "conacre" agreements. Essentially these are short term lease agreements.

Dairying and beef are the two main production sectors. Smaller, though significant, other sectors include: arable, poultry, potatoes, apples, vegetables and mushrooms.

Figures from the Department of Agriculture and Rural Development (DARD) indicated that in 2010 there were almost 49,000 farmers and farm workers employed within the sector. Furthermore, data for 2012 released by DARD would suggest that Total Income From Farming (TIFF)[1] for that year was £143,000,000 whilst Single Farm Payment claimants received £244,000,000 for the same year.

8b. How Northern Irish farmers do business

In the introduction to this Nuffield farming report I outlined some aspects that I believed to be true about farm businesses in Northern Ireland. To make generalisations is always dangerous. In this context some information from the College of Agriculture, Food and Rural Affairs (CAFRE) is worthy of note:

- There are perhaps 5,000-6,000 viable farm businesses in Northern Ireland. Viable is hard to define, but capable of supporting at least one family or labour unit would be a useful starting point.
- Across all sectors there are approximately 1,200 farm businesses who participate in the CAFRE Benchmarking programme.
- Due to the mixed nature of farm businesses, with multiple enterprise types, the 1,200 farms equate to around 1,800 enterprise benchmark figures.
- Most of these businesses have some form of development plan in place. Some plans would be more detailed than others. Plans would not necessarily be written down.

Continued on next page

[1] This measures the return to farmers, partners and directors, their spouses and other family workers for their labour, managerial input and own capital invested. It therefore represents the total income of all those with an entrepreneurial involvement in farming. *(DARD website)*

- The larger dairy farms as well as most pig and poultry businesses will have development plans in place.
- Detailed plans are a requirement of banks and financial institutions prior to loans being approved.

For the purposes of this part of my Nuffield report benchmarking will be taken as the business measuring tool (KPI) most likely to be used by Northern Irish farmers. Dairying and suckler-to-beef herds are the two sectors that we will focus on. The one measure we will compare is what percentage of Gross Farming Income (GFI) is taken in fixed costs and variable costs. It is important to note that any Single Farm Payment received by the benchmarked business is not included within these figures.

Within the dairy sector there are perhaps 3,500 farmers in Northern Ireland. The average herd size is 80 cows. The average size of benchmarked herds is 125 cows. CAFRE figures suggest that the top 25% of dairy farms are coming close to:

- One third fixed costs
- One third variable costs
- Remaining third as gross profit – minus personal drawings and tax

No indication was given as to where businesses outside the top 25% were. It would be fair to assume that the bottom 25% are very far off this mark, with the remaining two quartiles being somewhere mid-range.

Within the beef and sheep sector CAFRE estimates there to be between 17,000-18,000 beef and sheep farms in Northern Ireland. The average suckler cow numbers on these farms is 18 cows. For benchmarking purposes CAFRE targeted 100 suckler-cow-to-beef herds. Fifty cows is the average herd size benchmarked.

Average performance of these 100 benchmarked farms is:

- Fixed costs at 50% of GFI.
- Variable costs at 44% of GFI.
- Remaining 6% as gross profit – minus personal drawings and tax.

Similarly to the dairy sector - the top 25% of suckler-to -beef farms is coming close to the one third, one third, one third split of Gross Farm Income.

Results for the businesses in the bottom 25% are as follows –

- Fixed costs at 72% of GFI
- Variable costs at 54% of GFI

8c. Northern Ireland conclusions

To summarise and draw this section to a conclusion the following are some of my conclusions regarding the business of farming in Northern Ireland:

1. Land availability is a key issue in Northern Ireland. In general very small amounts of land come “on the market” for sale annually. Perhaps only 4% of the land area changes hands each year. Up to one quarter of this is never publically advertised but is normally sold privately normally to another family member.

   Conacre, the eleven month rental system, provides some liquidity in the land market in terms of facilitating a route to “scale up” an existing farm business. A tenant will not know whether they will be farming that land next year. There is therefore no incentive on the part of the person farming the land, to improve the fertility of that block. Why do something that another farmer will

get the benefit of the following year? - goes the argument.

Longer term lease arrangements, although increasing in numbers, still do not account for a large portion of the land farmed in Northern Ireland.

2. The Dairy and Suckler-to-beef businesses that are in the top 25% of benchmarked units are essentially profitable. Where a business can show one third of gross farm income (not counting Single Farm Payment) as gross profit this forms the basis of a profitable business.

3. The size and structure of Northern Irish farm businesses with small average acreages, small fields and perceived over-mechanisation make it difficult to keep fixed costs under 20% of gross farm income.

4. Part-time and hobby farmers are commonplace within the beef and sheep sector, with 18 cows being the average herd size – way too small to be viable. Off farm income is supplementing farm income within those businesses.

5. The average cow-to-beef benchmarked business and the bottom 25% category make for grim reading. These farms are barely breaking even, in the worst cases requiring their Single Farm Payment to break even.

Two figures mentioned at the beginning of this section of this report perhaps further confirm what the last point of the last paragraph was saying. Total income from farming (TIFF) for Northern Ireland in 2012 was £143 million. Total Single Farm Payment (SFP) paid to Northern Irish farms during that same year was £244 million. Take SFP out of Northern Irish farming and the result would be a huge reduction in the number of farms remaining.

10. Drawing the findings together – compare and contrast Northern Ireland with the rest of the world.

The first objective of my study tour was to compare and contrast business practice in family farm businesses in the United Kingdom - and in particular in Northern Ireland - with the rest of the world.

I propose to achieve this by listing in **bold** print the conclusions from New Zealand, Australia and South America. I further propose to make brief comment, in plain print, with a summary of what I believe to be the position within Northern Irish farm business units.

Agriculture plays a vital role in the economy of New Zealand. The agri-food sector is the largest employer within the Northern Irish economy. Having a devolved government in Belfast allows the farming industry to have more impact than would be the case on a United Kingdom-wide basis.

Because 80% of the food produced in New Zealand has to be exported there is a very strong market focus. The percentages of food that have to be exported from Northern Ireland are quite similar to the New Zealand figures. The only sector where this is not the case is the arable sector – Northern Ireland is a grain deficit area. The processing and retailing sectors are the most market-orientated parts of the Northern Irish value chain. Farmers in the region would not have the same degree of market focus that their Kiwi counterparts would have.

Young people (both males and females) want to become involved in farming in New Zealand. Prior to the 2008 global financial crisis the agricultural colleges in Northern Ireland struggled to attract students. Construction and other sectors of industry were seen as having better employment and earning potential than agriculture. When the recession hit, agriculture was seen as the "default position" - suddenly the colleges were "bursting at the seams" - increased numbers of young people wanted a career in agriculture. Availability of land and routes into agriculture for new entrants are much more restricted in Northern Ireland. Eldest-son-inherits-all is a very common "succession" scenario within Northern Irish farm businesses.

Education to degree level coupled with a person having early control of a farming business will generally lead to a more profitable enterprise. Research from the Agri-Food and Bio-Sciences Institute (A.F.B.I.) in Northern Ireland reveals similar statistics in terms of university education leading to enhanced business skills. Graduates are better managers. Getting control of the farm business is somewhat different. Quite often young graduates join the business with Dad - and sometimes Granddad - "still holding the purse strings".

Strategic planning is a vital exercise for all farm businesses. CAFRE estimate that 1,200 farmers - those that benchmark - out of the 5,000-6,000 businesses in the Province, have a development plan of some shape, form or description. An unknown is how many plans are written down.

Approximately half of New Zealand farmers do business performance monitoring. The figures for Northern Ireland would suggest that one-in-five farmers do benchmarking: 1,200 out of 5,000-6,000 viable businesses being the relevant numbers.

Business performance monitoring (KPIs) is carried out more frequently within the dairy sector in New Zealand. Globally dairying as a sector is seen as easier to benchmark than other sectors. Northern Ireland is no different with dairy farmers making up the largest group within the CAFRE programme.

Balanced Score Cards, S.M.A.R.T. planning and assessing variable costs, fixed costs and gross farm profit as a percentage of gross farm income are important tools used on New Zealand farms. Balanced Score Cards are rarely if ever used within farm business units. Government departments, including DARD, have used and continue to use the BSC tool. S.M.A.R.T. planning is carried out -perhaps one in five farmers participate (as per previous answers). Assessing costs as a percentage of gross farm income is perhaps measured less frequently. Numbers participating are hard to establish. What is clearer, however, is that Northern Irish farm structures makes the target percentages different from those of New Zealand. The aimed-for split is nearer to one third, one third, one third in Northern Ireland.

Continuous Improvement and Innovation (C.I.&I.), the "thinking process", has huge potential to enhance and improve how farm businesses are managed. Continuous improvement and innovation is not, to my knowledge, practised within any farm business in Northern Ireland. So the potential is there for the process to be embraced, initially by the more progressive farm businesses.

The CBH Group is a prime example of how a farmer-owned company plays a central role within the arable sector in Western Australia and indeed throughout the whole country. The CBH Group equivalent within Northern Ireland agriculture is the United Dairy Farmers organisation. United, farmer owned and managed, controls 60% of the NI milk pool. The group is involved in processing, marketing (under the Dale Farm brand) and logistics e.g. transportation and bulk tank servicing. Dairying is the most co-operatively-orientated sector within Northern Ireland. The fact that the co-op only controls 60% of the milk pool illustrates the independent culture that is widespread within Northern Irish farming.

Daily Grains, the online price discovery and marketing service, performs the function of providing timely market intelligence. The Ulster Farmers Union recently launched a monthly "Milk Price indicator" aimed at informing farmers of what their price expectations should be. Drawing together national and international "market intelligence", the Indicator is published on a weekly or monthly basis. Market intelligence for other sectors is available through AHDB levy Boards. Whilst similar to Daily Grains, the tools in use in the UK and Northern Ireland fall some way short of the Australian equivalent.

Bullaburra demonstrates collaborative farming at its best-providing "win-win" solutions for all stakeholders. Northern Irish farmers do not have a culture of co-operation. Indeed it has been said that "the only reason two farmers co-operate is to do the third one down!"

Businesses need to be able to differentiate between real estate (land and property) and agri-business (farming) and if necessary separate the two for maximum performance. Ownership and control of land *runs deep* in the physic of Northern Irish farmers. For a farmer, the thought of having someone else farming their land borders on the unthinkable. Perhaps this is one reason why co-operation rarely happens in N.I. I would suggest the minority of farm business owners in Northern Ireland would not differentiate, to any great

degree, between these two parts (real estate and agri-business) of their operation.

Risk management for farm businesses is seen as a vital and necessary part of managing any farm business. This is especially so in regions where climatic extremes occur. Farmers in Northern Ireland, I would suggest, don't have elaborate risk management strategies in place within their farm businesses. Perhaps a small number have. Some more would have thought about risk within their business and taken no action. Others would look blankly at the mention of risk - never mind management of risk – they would not have the first idea what was meant.

Farmers are still production orientated rather than profit focused. When Northern Irish farmers compare how good or bad a farming year they have had, most focus is on the gross margin of a particular crop or enterprise. Discussion will also centre on average milk yields per cow or what price is being received for feed wheat. Very rarely will overall business or enterprise profitability be mentioned. A focus on profit is a focus on reality!

The importance of having a clear business vision and business goals, as highlighted in the "Cornwell Business Report". Very few, if any Northern Irish farm business units would have as detailed and comprehensive a document regarding their business enterprise as this one. A report such as this gives an excellent synopsis of any business. I suspect very few such detailed plans would exist on Northern Ireland farms.

Social policy considerations rather than food security appear to be the priority for governments in South America. The EU Single Farm Payment, it could be argued, is a "social policy" designed to keep farmers on the land. Within Northern Ireland the businesses that are CAFRE benchmarked and are outside the top 25% are essentially being sustained on the land by EU subsidies. This is no different to dairy farmers outside Rio-de-Janeiro producing milk because of tax incentives.

Where one part of the production "value chain" is dominant or has a monopoly, other parts of the chain suffer and the full potential of agriculture is not realised. Within Northern Ireland the retail sector is the strongest part of the value chain. Were farmers to receive a greater (or fairer) proportion of returns from the chain, more market-focused production would result. It would be evident to farmers that they were being rewarded for producing quality. As of now farmers are "price takers" rather than "price makers".

Lack of an agricultural infrastructure almost always means that farmers are more individualistic. "Work as a team and do it my way" thinking is widespread in South America. United Dairy Farmers within the Northern Ireland scene is the best example of infrastructure and co-operation. Having said that, within the United "membership" there is a competitive edge between their farmers. Whether it is cow numbers or acres farmed, the competition is fierce. "Work as a team and do it my way" definitely applies to Northern Ireland.

It is an advantage for a farmer to have had another career before "going farming". Earning potential from farming would need to match, or come close to matching, income available from other careers. Land availability can make the pathway to farming more difficult in Northern Ireland.

10. Chapter conclusions

Keeping in view the first objective of my Nuffield study tour, "to compare and contrast business practice in family farm businesses in Northern Ireland with the rest of the world", here are my conclusions:

Having travelled around the globe, come home and recommenced my farming career in Northern Ireland, I believe there are farmers in this region who are equal to, if not better than, farmers in the rest of the world. Furthermore I think agriculture in this region has an exciting future. For Northern Ireland's farming's full potential to be realised I believe the following issues need to be addressed:

- Farmers must differentiate between land ownership and the farming business.
- Farmers must have strategic plans in place for their businesses.
- The next generation of farmers must have the appropriate "skills set" and be allowed "early control" of the farming business.
- Farmers must co-operate with each other to a greater degree than at present.
- Increased numbers of farmers must business performance-monitor. Profit must be the primary focus.

SOME FOOD FOR THOUGHT FROM AFRICA

In Africa the sun rises and a gazelle wakes up - his priority for the day is to run faster than the slowest lion - otherwise he is in big trouble. He ***GETS EATEN.***

At the same time a lion wakes up - his priority for the day is to run faster than the slowest gazelle-otherwise he is in big trouble. He has ***NOTHING TO EAT.***

So if you are in business then, just like the gazelle and the lion in Africa, when the sun rises then you had better be running.

11. Responsiveness to change

11.1. Introduction

This chapter of the report will examine the issue of responsiveness to change - both in the countries of the world that I visited during my study tour and in individual sectors of the farming industry. The second objective of my Nuffield Farming Study Tour was to "evaluate levels of responsiveness to change".

I propose to achieve this by looking at the New Zealand industry, the Australian and the South American industries and compare these regions to what happens, in my experience, within the Northern Irish farming industry.

Whilst visiting New Zealand I spent time with a farm consultant near Ashburton on the Canterbury Plain, named Andrew MacFarlane. It was during this meeting that the **Everett Rogers Law of Diffusion** was mentioned. This theory seeks to explain how, why and at what rate new ideas and technologies spread through cultures. This model has relevance as a measure of how responsive to change an industry or a culture or a nation really is. I propose to use the model to measure or categorise responsiveness to change within global agriculture.

See Fig. 14 on next page : The Everett Rogers Law of Diffusion.

Within the model there are five categories of adopter. These are-

- Innovators
- Early adopters
- Early majority
- Late majority
- Laggards

The model in the shape of a bell curve is shown in diagram form in **Fig. 14, next page.**

Each adopter has certain specific traits and characteristics as outlined below:

Innovators are-

1. First to adopt an innovation or change
2. Willing to take risks
3. Have great financial liquidity
4. Have close contact with scientific sources and other innovators
5. Have high risk tolerances

Early adopters are-

1. Second fastest to adopt an innovation or change
2. Typically younger in age
3. Advanced in education
4. More discrete in adoption choices than innovators

The early majority-

1. Adopt an innovation after a varying degree of time
2. Sometimes significantly later than innovators or early adapters
3. Have contact with early adapters

The late majority-

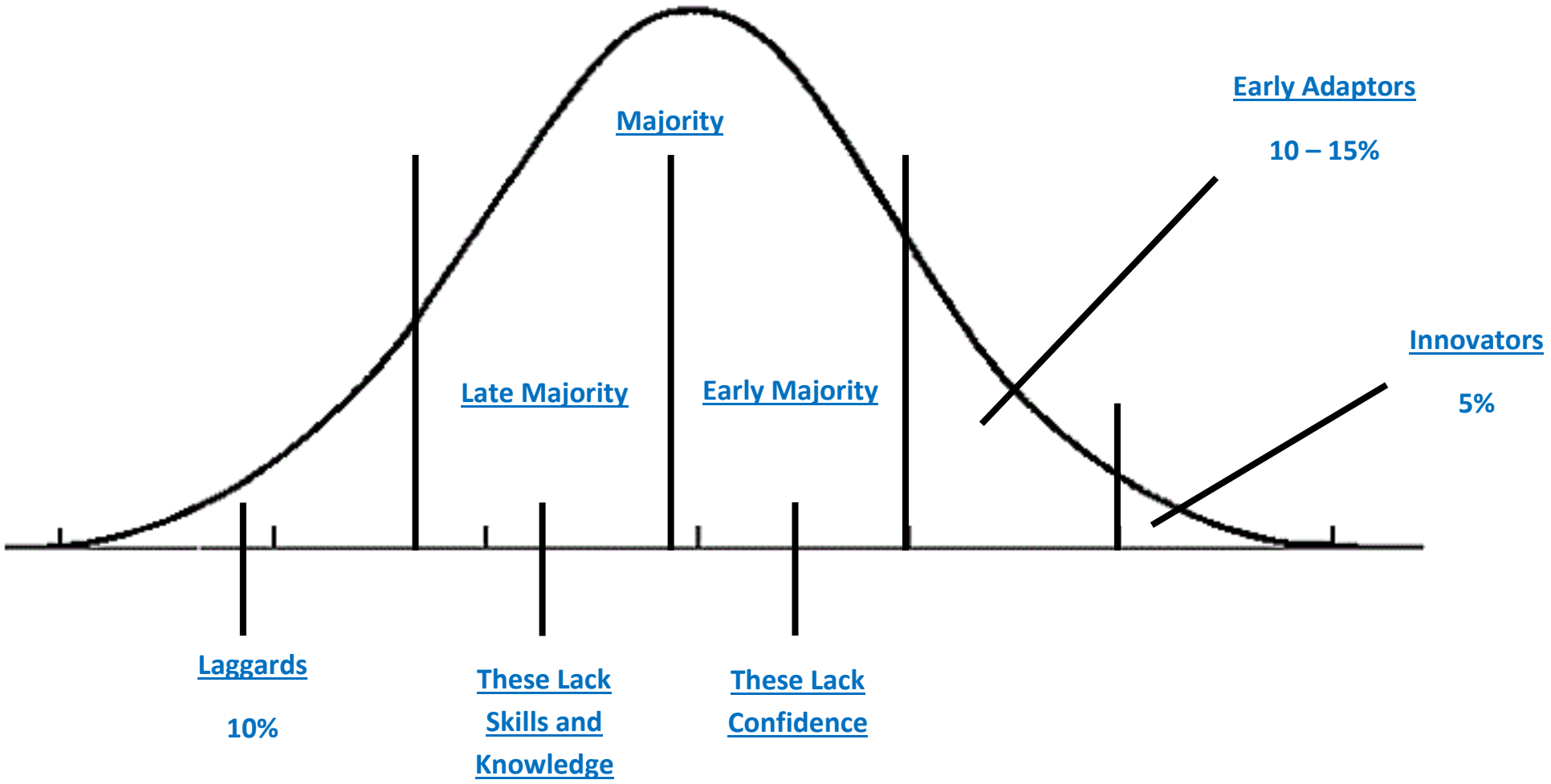
1. Will adopt an innovation after the average member of society
2. Approach an innovation or change with a high degree of scepticism

The Laggards-

1. Are the last to adopt an innovation or change
2. Have an aversion to "change agents"
3. Tend to be advanced in age
4. Tend to be focused on traditions

There are five stages in the Decision Innovation process. These are available

Fig. 14 : The Everett Rogers Law of Diffusion



outwith this report. Because this chapter is, if you like, measuring responsiveness to change no further detail on the Everett Rogers process will be mentioned at this point.

I will draw on information gleaned from my study tour to provide examples of what I believe to be responsive or non-responsive behaviour. Some of the examples have already been mentioned in the previous chapters of this report whilst other information will be new in this chapter. Where the example has already been mentioned in an earlier chapter a brief "bullet point" will suffice in this chapter. Greater detail will be given where the information is *new* to the report.

Concluding the text regarding each country this question will be asked: Is [The country].....responsive or not? The answer to the question will be my opinion based on the evidence gathered during my Nuffield Farming Scholarship travel.

11.2. Responsive or not - New Zealand

11.2.i. Irrigation

The RDR Irrigation Canal on the Canterbury Plain was constructed by the New Zealand government in the "depressive years" of the 1930s as primarily a public works project to provide employment. The canal provided "dyke" irrigation for surrounding farming businesses. It took until the 1980s for the canal to be used to its maximum potential. Direct and indirect government subsidies for irrigation ceased in the mid-80s. Since 1992 irrigation has been 100% farmer-funded.

See picture of the canal on next page

In 1992 there were 20,000 hectares under irrigation in the Canterbury area of New Zealand. That figure had increased to 400,000 hectares by 2012. As well as the area covered by irrigation having changed, the technology used has "moved on". Early boreholes only reached a depth of 20-30 metres. Advances in machinery allow depths of up to 300 metres to be achieved at present. One hundred metres is seen as the "economic limit".

Efficiency of water use has greatly increased in recent times. In the 1970s "dyke" irrigation required one litre per hectare per second to satisfy crop demands. "Centre pivot" systems now require just 0.45 litres per hectare per second.

One farmer I visited near Ashburton in Mid Canterbury farmed 500 acres in partnership with his wife. The farm is a mixed arable and drystock business. This family has recently installed a centre pivot irrigator on the farm. They took "the long term" view on irrigation when deciding to spend $1,000,000 NZ dollars (£600,000). Reason – "irrigation means liberation = more versatile business". Essentially they can now maximise returns from their business.

What does this really mean for this business? For one, irrigation provides "certainty of grass supply". Number two - each day that the irrigator is operational costs this business $170 NZ dollars (£90). How does a wet year compare with a dry year? According to my host, in a wet year farm profit increased by 21% whilst in a dry year the increase was 64%.

See picture of centre pivot on next page

Three quotes from this farming family illustrate their aimed-for level of responsiveness to change:

- "We constantly evaluate where money is to be made".
- "Always asking the question: how can you optimise grass and cereal production into dollars in the bank".

The RDR Irrigation Canal, Canterbury Plain, New Zealand

Centre pivot irrigation - Canterbury Plain, New Zealand

- "We are constantly aware of the conversion ratio from kilograms of dry matter to dollars in the bank"

The irrigation system on this farm provides this business with more possible ways to achieve desired business objectives.

From my observations on how irrigation operates in the Canterbury Plain I can only conclude that the farmers have been, and continue to be, very responsive to change. When Government deregulated agriculture, including the RDR canal, the farmers took control. They recognised the opportunity, seized it, and have embraced the advances in technology since.

11.2.ii. Dairy conversions

Dr Liz Dooley from the Farm Management Department at Massey University took the view that the trend in New Zealand was toward "dairy conversion". A number of factors have led to this:

- During the last ten years growth in the dairy sector has been assured. Milk prices have increased, profits have increased and land values have gone up.
- The Fonterra Co-op owning "as much of the value chain as possible".
- Enhanced irrigation technology being able to irrigate more acres especially on the Canterbury Plain.

New Zealand dairy farmers produced 12,000,000,000 litres of milk in 2001. This increased to 15,000,000,000 litres by 2012. Before the 2008 global financial crisis skim milk powder was trading globally at $5,300 US dollars per tonne. Four years on the 2012 price was $1,600 US dollars per tonne. Farmers supplying Fonterra in the 2007/8 production year received $7.50 NZ per kg of milk solids. This record price was undoubtedly another factor influencing the trend towards "dairy conversions" in New Zealand. Farmers saw an opportunity and responded.

A dairy farm I visited near Taupo in the central region of the North Island provided an illustration of some of the limiting factors that will, in future, impact on milk production in New Zealand. This business was currently milking 1,200 cows. Beef and sheep were produced on the farm up until 1994. A dairy processing plant opened in the region and this farming couple started milking cows.

Known limiting factors coming down the track toward this, and all other dairy farms, include: reduced water extraction rights, regulation to limit fertiliser usage and reduced stocking rates. What this means for this business is: less cows and less milk sold!

How is this family planning to respond? They could spend perhaps 500,000 New Zealand dollars and construct a "cow home"- essentially a slatted house with slurry storage. This would increase the debt burden on the business and would have a negative impact. Or alternatively they could focus on herd genetics as a means of increasing production. DNA profiling is going to be one of the only ways, in the future, of increasing milk production in New Zealand – according to this family. When I visited the business a programme of DNA testing was under way. The aim was to "breed for production". Adversity was recognised and this business responded.

To conclude, dairy farming in New Zealand is without doubt responsive to change. The evidence from the last 10-15 years is there for all to see.

11.2.iii. NZ beef and Lamb

Approximately 15% of beef and sheep herds in New Zealand are owned by "lifestylers"

(hobby farmers). These herds typically number 20 cattle or less. Rob Davidson of NZ Beef and Lamb believes these farmers will never respond to change. For them "running a few cattle or sheep is just a hobby, just a way to relax and unwind after a day at the office!"

Aside from the lifestylers there are perhaps 12,500 commercial beef and sheep farms in New Zealand. Each year 500 are chosen to participate in a business performance survey. All aspects of the business from financials through to herd performance are recorded.

This statistically robust survey has been performed annually for nearly 50 years. Consistently the difference between the top 25% and the bottom 25% of producers has been massive. When the lowest 25% are challenged about their poor performance excuses will be made. A common excuse is that they, the lowest 25%, have high bank borrowings - when in reality it is the higher performers who have the highest borrowings!

According to Davidson arguments and excuses such as these "have to be killed" before there is any chance or possibility of the lower performers recognising their circumstances and attempting change. Given that the average rate of return on investment on all New Zealand beef and sheep farms is of the order of 1.5% it is not only the lowest 25% who need to change!

From my observations, the beef and lamb sector would not present as a segment of the New Zealand agricultural economy that shows a high degree of responsiveness to change. Having said that there are beef and sheep businesses who "do the job well", who are watching for the "next big opportunity", and who are, without doubt, very responsive to change.

11.2.iv. Other relevant information

1. When speaking with a farm consultant the "new opportunities" theme was mentioned. The consultant said: "The shrewd farmers know when to jump. Fonterra, like subsidies, can stifle entrepreneurship in farmers! Happens when a business sits in a cosy little world - why should they change? Meanwhile the average farm size around them keeps growing". His view was: the skills set of the individual, combined with good horizon scanning, was key to running a progressive farming business.

2. Within New Zealand agriculture there is a club - the "Century Farm Club". Membership of this club is bestowed if a family has owned a particular farm for 100 years or more. Well informed opinion in New Zealand would suggest that awards like this are barriers to change.

3. Julian Raine owns and manages a diverse range of farming businesses at Nelson near the top of South Island. Dairy farming is the dominant enterprise on the 800 hectare farm. Additionally 200 hectares of soft fruit are grown. Apples, blackberries, redcurrants, hops and kiwi fruit are produced on the farm.

   Traditionally most apples on the farm were marketed in Europe. In the last number of years that market became increasingly difficult to supply. Requirements of the European supermarkets and distance from end market were two issues. In response this farm looked around and identified the South East Asian market as having potential. Problem - Europe and Asia required different varieties of apple! The decision was taken - all the apples trees were "re-grafted" with varieties suitable

for the new market. A quote from Julian: "If the model isn't working, you change the model".

11.2.v. Responsive or not? – the verdict : New Zealand

In terms of the Everett Rogers Bell Curve the following is my view:

- The farmers who took over the irrigation system are in the **Innovator/Early adopter category**
- Farmers converting to Dairying are in the **Early majority category**
- Farmers finding new ways to maximise dairy production e.g. DNA testing, are in the **Innovator/Early adopter category**
- Beef and lamb "lifestyle" farmers are in the **Laggard category**
- The average beef and lamb producer is in either the **Early majority or Late majority category**
- Century Farm Club members are probably in the **Late majority category**

Based on the examples I have given, and on the other meetings and contacts during my time in New Zealand, my view is that farm businesses in the country are responsive to change. Deregulation of agriculture and the end of subsidies in 1984 have had a huge influence on this economy and would have had the effect of increasing levels of responsiveness to change.

Does this bird, the Puketo or Purple Swamp hen, (see picture on next page) symbolise how responsive to change New Zealand agriculture is?

There are two reasons for saying this – the Puketo was supposed to have been resident in New Zealand before the earliest humans and secondly, as the name would suggest, the bird used to prefer marsh and swamp land areas as habitats!

The species has multiplied significantly since humans arrived = responding to change!

This picture was taken in a grassland paddock on a highly productive dairy farm = responding to change!

In short – **New Zealand farmers are market focused, they don't have the safety net of government subsidies, and the bank managers keep them honest!**

11.3. Responsive or not? – Australia

11.3.i. Business life cycles

Brendon Tierney, a farm consultant, mentioned in a previous chapter of this report, had some thoughts on responsiveness to change amongst the farmers with whom he works in Western Australia.

His first thought – "in the ideal world, how responsive a business is to change should be dependent on where in the *life cycle* that business is found."

There are four phases in the life cycle of any business, they are –

1. The Development phase
2. The Growth phase
3. The Maturity phase
4. The Decline phase

Responsiveness to change is likely to be greater during the development and growth phases of a business.

Development phase - A person starts a business. In the early days everything is considered as a means of building and developing the enterprise. New products, new people and new ways of reaching out to new

The Puketo bird – Picture of NZ Agriculture – responsive to change.

Straw carts - cultural weed control - Western Australia

customers all require a high degree of responsiveness to change.

Growth phase - during this phase similar openness to change is required. Existing customers and products have to attract more customers for the business to increase in size.

Maturity phase - During the maturity phase levels of responsiveness to change decrease, market share has been achieved, existing customers are being retained and products are selling well in the market place. Everything is performing well!

Decline phase - Responsiveness to change decreases further during this phase of the business cycle. The owner is perhaps nearing retirement or the business could have become a candidate for a buy-out by another company. Why should the owner change at this time – it's too near the finishing line!

Tierney takes the view that those are some of the issues and reasons around why responsiveness to change ideally should depend on where, in the life cycle, the business is.

11.3.ii. The Sheep's Back

As part of Extension and Consultancy work in W.A., Brendon is involved in a programme called *The Sheep's Back.* This programme is aimed at increasing the profitability of the sheep enterprise. There are four stages or phases to this programme:

1. Recognising the need for change
2. Presenting information on new technologies
3. Implementation of change
4. Reviewing what has been changed and – making review a habit

In Western Australia the consultant and the farmer normally move straight to Step Two. Brendon believes: "If you don't get the farmer to recognise the need for change it won't happen!"

Change is less likely to happen if the economics of the business are sound – is the business profitable? Essentially if profitability is still there – why change?

To change or not then becomes a lifestyle issue. Brendon Tierney takes the view that change for lifestyle reasons is acceptable as long as the **rules of profit** still apply. Put simply: is the business still profitable?

11.3.iii. Bullaburra

When John Gladigau asked himself the question in 2007: "Where will I be in ten years' time? Will I own my neighbour's farm or will he own mine?" he knew something needed to be done! And so collaborative farming became the "twinkle in his eye." One year later Bullaburra came into existence! And the rest as they say is history. The business that John and his friend Robin Schaefer have built is truly innovative. In the majority of the last five years the business has turned a profit and the partnership is about to commence the second five year term!

In my opinion, what these two farmers have created with Bullaburra shows a high degree of responsiveness to change.

11.3.iv. Herbicide resistance and harvest weed seed control

Herbicide resistance has been a developing problem for arable farmers in Australia in recent times. The most problematic weed species are prolific seed producers capable of establishing a large viable "seed bank" in just one season. How serious an issue chemical-resistant weeds are cannot be overstated. Herbicides literally have no effect when sprayed onto the plant. Other methods have had to be developed to control weeds on arable farms. One such method was being

practised on Andrew Fowler's arable farm in Esperence, Western Australia.

Because a very high proportion of seeds is retained on the upright stems and tillers of the weed plant at crop maturity, the potential is created to target these seeds during the harvesting process. The solution – a straw cart! **See picture two pages back.**

This cart, which looks like a larger version of a "round baler", is towed behind the combine harvester. A conveyor belt brings the chaff and fine material from the combine and deposits it in the "cart." All remaining straw is chopped and left on the stubble.

When the straw cart is full a signal is sent to the driver of the combine, the machine stops, the door of the straw cart opens and a load is deposited. When the combine finishes the paddock a whole series of piles remain dotted throughout. The material in these loads is then burned during the post-harvest period. Why burn the chaff? Answer: high concentrations of "weed" seeds are present in these loads of material. When the material is burned the weed seed is also destroyed. As a result the burden of weed infestation in the subsequent crop is reduced. The experience of arable farmers in the Esperence region, and elsewhere in Australia, is that this "cultural" method of controlling weeds is very effective.

In my opinion this means of cultural weed control demonstrates a very high degree of responsiveness to change.

11.3.v. Adoption of min- and no-till crop establishment techniques

In dry-land areas of the world such as South Australia and Western Australia maintaining soil structure and moisture conservation are two major issues facing all farmers. In past decades conventional plough-based establishment was practised on arable farms in these regions.

With prevailing weather patterns becoming dryer and dryer in Australia, and with "dust storms" occurring on a more regular basis, the risk of a "dust bowl" being created loomed large. The soil, the foundation for all farming, was been *blown away* - never to return. I was taken to a paddock (field) near Loxton in South Australia where the evidence of this soil erosion was there for all to see.

The Mallee tree is an indigenous species in that part of Australia. This tree requires a deep rooting system to source moisture and stay alive. One tree in this paddock ***(see picture on next page)*** had six feet of roots exposed. I posed for a picture beside the tree!

YES – six feet of soil had been blown from this part of this field during the last 70 or 80 years. This had to stop. Failure to change would have meant more soil being lost. Soon there would have potentially been none left. **No soil means no farming business!** Out of adversity farmers responded, made changes and moved on! Crop establishment techniques were adopted – min-till and no-till with the emphasis on minimal soil movement.

See picture of no-till seed drill, on next page.

Changing crop establishment methods in this fashion demonstrates a high degree of responsiveness to change in my opinion.

11.3.vi. CBH Group- for sale?

In the previous chapter of this report mention was made of the CBH Grain Co-op in Western Australia. Four-and-a-half thousand farmers own the company on a flat rate share basis – each farmer has a $2 AUS dollar share. With assets of $1,500,000,000 AUS dollars each share is valued at a tidy sum! Such a windfall

Six feet of top soil blown away - Mallee tree with roots exposed

No-till seed drill in Loxton, South Australia

would only be realised should the co-op ever be sold.

In the last 5-10 years a small but vocal minority of co-op members has been campaigning for the Group to be sold. Farmer members who are attracted by the "windfall" cheque are leading the campaign. Perhaps this is born out of economic adversity coupled with the droughts of the last number of years. Perhaps they were casting an eye on South Australia where a similar organisation was sold off several years ago.

So far the majority wish has been to remain united within the co-op. It remains to be seen for how long this position will be maintained. A move to sell the co-op would be responding to change. The question would be: in the longer term would such a sale be in the best interests of Western Australian grain farmers?

11.3.vii. Clay incorporation

Peter Longmire farms 6,000 hectares of arable crops in the Esperence region of Western Australia. Peter is a precision farming enthusiast growing wheat, barley and pulses. Across this farm the sand and soil combined depth is 8-10 inches, with one metre of clay below this.

See picture on next page.

As with most of the region, providing soil structure and moisture retention are two massive issues for this farm.

Longmire has a novel means of achieving both these objectives with two actions. A subsoiler type implement rips balls of clay to the surface. The clay is then left to dry naturally before being *smashed* and *incorporated* into the soil using a cultivator.

The clay retains the moisture, stops the soil from blowing and provides the structure – all at once! ***(see picture on next page).*** This is a novel solution that increases the food producing ability in that part of Western Australia.

See picture on next page – clay incorporation to build soil structure.

11.3.viii. Responsive or not? – the verdict : Australia

In terms of the Everett Rogers Bell curve the following are my opinions:

- The two farmers who founded the Bullaburra collaborative farming business are in the **Innovator category.**
- The farmers who use straw carts as a cultural control method for herbicide resistant weeds are in the **Innovator/Early adaptor category.**
- The farmers who moved from the plough to no-till and min-till establishment techniques are in the **Early adaptor category.**
- The farmers who want to sell the CBH Group are in the **Late majority category.**
- The farmers who use clay incorporation as a means of retaining moisture and improving soil structure are in the **Innovator category.**

As I travelled through Australia on my Scholarship study it quickly became apparent that the agricultural industry is dynamic and responsive to change. Adverse climatic conditions and a lack of government intervention in agriculture have hugely influenced the Australian farmers' outlook.

In one phrase **– if they hadn't changed they would have died!**

Ten inches of sand, then clay - ready to be "ripped up" and incorporated. Esperance, Western Australia

Clay incorporation to build soil structure and retain moisture - Western Australia

11.4. Responsive or not? - South America

11.4.i. Dairy farming North of Rio

Farmers in the region north of Rio de Janeiro who are going back into milk production are responding to changing circumstances. Essentially tax incentives from the regional government are leading this move back to dairying.

But what of production costs, what of economies of scale, what of the rules of profit? Are any of these factors taken into consideration when these farmers are buying their cows? Answer - probably not. No, think again - answer *definitely not,* given that 80% of them only produce 50 litres of milk per day. Experts say that a minimum of 500 litres per day is required for a dairy farm to be sustainable.

11.4.ii. Chilterra

Ricardo Rios and the Kiwis are building a dynamic and progressive business in Southern Chile. They have recognised that dairy farming in Chile must change and are doing something about it! Whether it is building agricultural infrastructure, the non-hierarchical management structure, or employing RESILIENT people, this company is leading change within agriculture in Chile.

One example from this company; the fully illustrated book of cartoons is innovative to a greater extent than anything I have ever seen anywhere in the agricultural world. It brings humour to the dull subject of staff training! Get on with the job, make mistakes, but learn from your mistakes is the underlying message.

11.4.iii. Peru

The Peruvian dairy farmer milking 600 cows and selling every litre of milk at under the cost of production is not being responsive to change. Why continue is the question? Perhaps it is the promise of revenue from the sale of the property at some point in the future. But is that a good enough reason? Where are the rules of profit operating in this business? Answer: there are none.

In a similar category are the 6,000 farmers who supply Gloria. These farmers, subsistence farmers in some cases, are “stuck in a rut” producing milk and taking the price given to them.

I would suggest this behaviour is typical of the majority of farmers within the dairy sector in Peru. Some producers would undoubtedly be good at their job, be efficient and perhaps profitable. However while the processing part of the chain is dominated by one player, which is not farmer owned, the full potential of the farming industry will not be realised.

Dairy farmers in Peru do not exhibit a high degree of responsiveness to change.

11.4.v. Responsive or not? – the verdict: South America

In terms of the Everett Rogers bell curve the following are my opinions -

- The farmers who are starting to produce milk in response to government tax incentives are in the **Late majority category.**
- The Chileans and the Kiwis who founded Chilterra are in the **Innovator category.**
- The dairy farmers in Peru are in the **Late majority category.**

During the tour of South America responsiveness to change was evident amongst a sizeable portion of the farming industry. Very small farmers are present right throughout Latin America, sometimes in very large numbers. These producers would not exhibit the same degree of responsiveness to change as their larger counterparts.

11.5. Responsive or not? - Northern Ireland

Northern Irish farmers, like most farmers globally, respond to minor changes and advances in technology. Whether it's dairy cow genetics, continental beef breeds or new cereal varieties – most farmers want the new thing!

Sections of the farming industry that receive EU Single Farm Payment tend to be less responsive to change than non-subsidised elements. There are, as always, exceptions to this rule!

a) Non subsidised enterprises

Poultry, pigs, horticulture, potatoes and apples are non-subsidised. With no safety net – profit rules should apply! These businesses, for the most part, are responsive: they answer to the bank manager!

11.5.i. Enterprise mix within farming businesses

The "enterprise mix" within farm businesses in Northern Ireland adds a further complication. A high proportion of farming units will have two or maybe three enterprises within them. From a *spreading the risk* perspective this has advantages for the business. If arable is profitable and dairy is not, at least something is making money - goes the theory! However in the longer term, if one part of the business were to be continually subsidising another – this would not be good. The overall business would be adversely impacted by this!

11.5.ii. Expanding dairy businesses

Dairy businesses that have expanded in recent times, although subsidised, have responded to change. The response occurred when they realised they had to expand - in reality there was not a "living wage" available from milking 50 cows.

11.5.iii. Beef and lamb enterprises

Beef and sheep farms in general are responsive with the minor things e.g. the introduction of Continental cattle breeds into the herd. The top 25% will recognise the need for change and do something. Most of the rest will keep doing what they have always done. In practice the subsidy payment is the profit within the enterprise or, worse still, the money that means the business will break even.

11.5.iv. Responsive or not? – the verdict: Northern Ireland

In terms of the Everett Rogers bell curve the following are my opinions –

- Non subsidised pig and poultry businesses are in the **Early adopter category.**
- Dairy businesses that have expanded are in the **Early adopter category.**
- The top 25% of beef and sheep businesses are in the **Early adopter category.**
- The majority of beef and sheep businesses are in the **Late majority/Laggard category.**

There are many farmers in Northern Ireland – the ones that understand the rules of profit – who show a high degree of responsiveness to change. There are however many, many more, typified by most of the beef and lamb producers, who are just "farming for the subsidy."

In one phrase - **entrepreneurship is challenged when there are subsidies!**

11.6. Responsiveness to change - a global comparison

The second aim and objective of my Nuffield study tour was to "evaluate levels of responsiveness to change" in family farming businesses - in the United Kingdom and

Northern Ireland in particular - against the rest of the world. The following four paragraphs summarise the findings of my Scholarship tour in relation to this second objective.

Farm businesses in **New Zealand** are responsive to change. Farming in the country has been heavily influenced by deregulation and the ending of agricultural subsidies in 1984. Farmers, for the most part, are *market focused* and, with no subsidy safety net, their bank managers keep them honest!

For **Australian** farmers, climatic adversity and the lack of government intervention has birthed an industry that is responsive to change. Failure to embrace and implement change would have meant economic ruin. If they hadn't changed they would have died!

Farmers in **South America** appear to be, partly at least, responsive to change. Some are responsive to change that is positive - where the rules of profit apply. For others, responsiveness to change when based on government tax incentives, will lead to change that is negative.

The top 25% of farmers in **Northern Ireland** exhibit high degrees of responsiveness to change. Others are farming on till the money is done. The European Union subsidy system has a heavy influence on how these farmers manage their businesses.

To sum up – as with *the business of farming*, geography does not have a huge degree of relevance to how responsive a business is to change. Much more likely to influence are factors such as: business culture, climatic conditions, subsidies and tax incentives, to give but a few examples.

11.7. Chapter conclusions

The Everett Rogers model of diffusion seeks to explain how, why and at *what rate* new ideas and technologies spread through cultures. The "bell curve" is a representation of what **average** is supposed to be. The diagram on next page provides the illustration. **(see Figure 14, next page, 64)**

So, if this diagram represents average global responsiveness to change across all peoples, industries and cultures, what does Northern Ireland agriculture look like on the "bell curve?" Based on my findings and combined with my opinions I think **the curve** could look something like this -

See Everett Rogers diagram adapted to Northern Ireland's situation : page 65

To conclude: for Northern Ireland farming businesses to improve, to become nearer average, then in terms of responsiveness to change, farmers **must** give consideration to the following five conclusions relating to this chapter:

- The rules of profit must apply when being responsive to change.
- Responding to changing circumstances, if led by spotting or exploiting an opportunity, has huge potential to improve a farming business.
- Adversity can also be a driver for positive change. Extreme weather events or climatic changes over time make change imperative.
- Because a farming business is responsive to change is not necessarily a step toward improving that business.
- Being responsive to change is a backward step when a "bandwagon" is joined and when the change is not based on sound economics.

Fig. 14 : The Everett Rogers Law of Diffusion

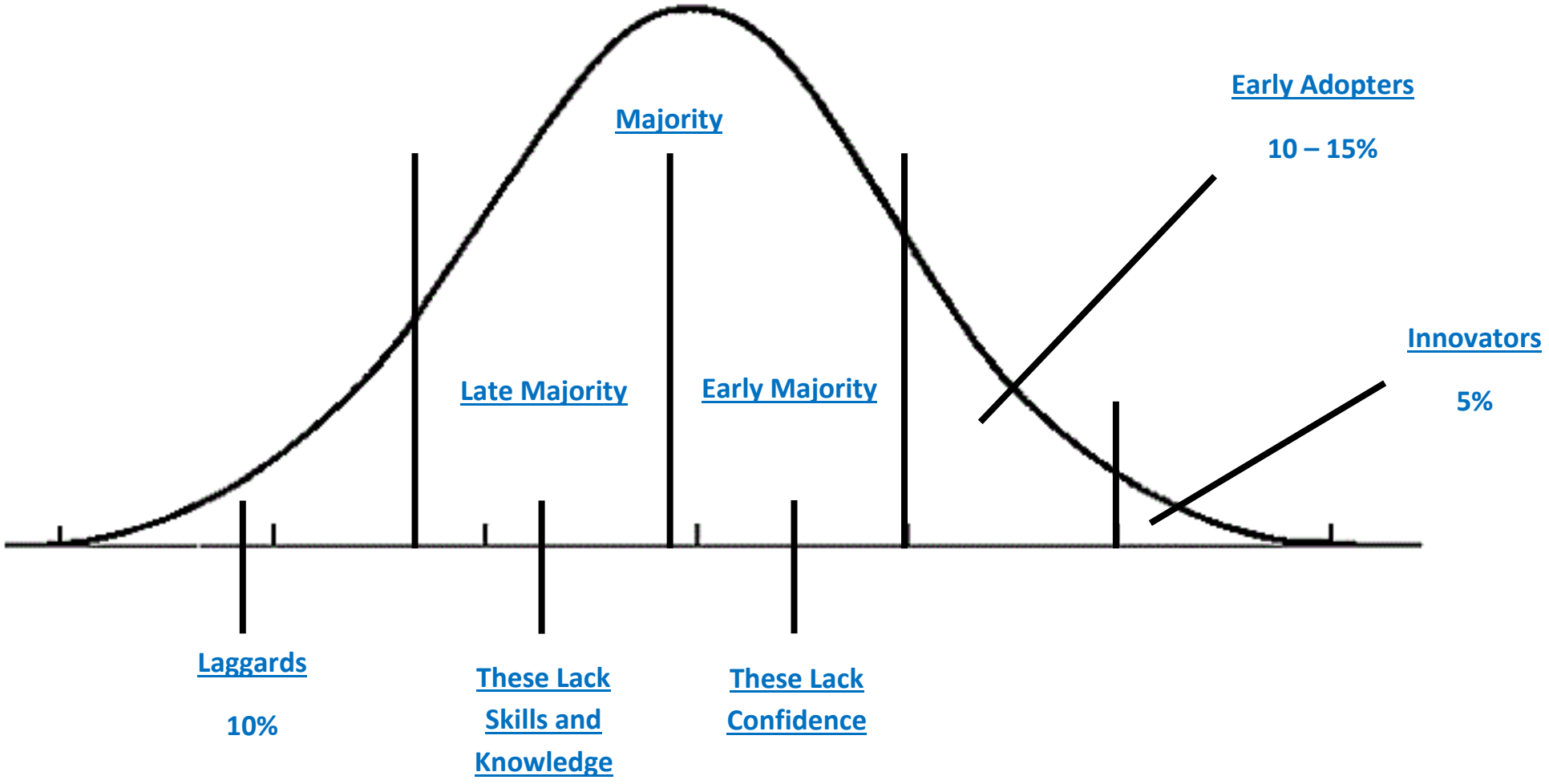
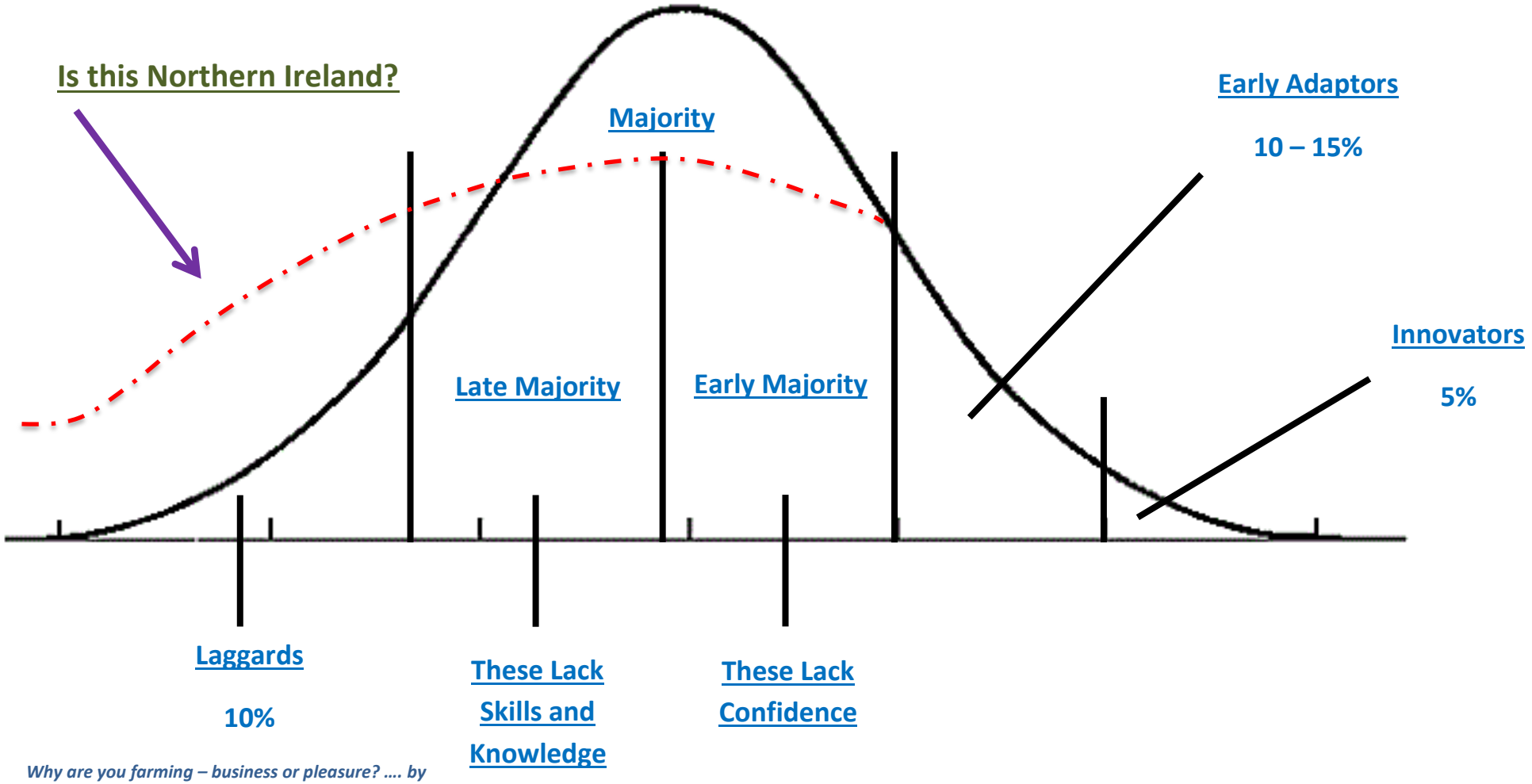


Fig. 15. Everett Rodgers Law of Diffusion – applied to Northern Ireland



12. Conclusions from my study tour

As this Nuffield Farming Scholarship report is drawn to a close now is the time to draw all findings, thoughts and opinions together onto one page. Keeping in mind the first two aims and objectives of my study tour, my conclusions are as follows -

1. The skills set of the individual manager is the important thing, not the country where the business is located.

2. The next generation of farmers must have the appropriate **skills set** and be allowed **early control** of the farming business.

3. A family business should be managed as two separate business units: a property owning business and a farming production business.

4. Strategic management and risk management **must** be part of how a farmer runs their business.

5. Business performance monitoring and increased levels of co-operation with other farmers are two issues which must be addressed.

6. The **rules of profit** must apply when a business is being responsive to change.

7. Responding to changing circumstances, if led by spotting or exploiting an opportunity, has huge potential to enhance a farming business.

8. Being responsive to change is a backward step when a “bandwagon” is joined or when decisions are not based on sound economics.

13. My recommendations

The third and final aim and objective of my Nuffield Farming Scholarship tour was "to bring recommendations as to how change can be effected within farm businesses in the United Kingdom and in particular Northern Ireland". Here are my recommendations:

1. **A farming business is two businesses not just one**
   - farmers should be encouraged to separate the land and property which they own from the farming business that they run. By taking this step farmers will have a much more realistic appreciation of the areas within their business that are profitable and those that are not. Accountants and other professional advisors should be encouraged to assist with this process.

2. **Correct skills set and early control vital**
   - there should be an immediate review of all existing agricultural education provision especially in terms of how business management competencies are taught. A "business programme" with a mentoring provision should be developed to focus on enhancing business management competencies. Participation in the mentoring part of the programme should be mandatory and last for three years.

   Farmers in their 20s and 30s should be encouraged to participate in the programme mentioned previously. Mentoring would be beneficial for two reasons: 1) it would allow follow-up assessment of the programme participant in terms of how the *learning is being put into practice.* 2) it would have the potential to demonstrate to more senior members of the family that the "young Turk" has the ability and will drive the business forward.

3. **Written strategic and risk management essential**
   - each farming business must have a written strategic management plan and a written risk management strategy in place for the business. The plans should be reviewed on a regular basis, preferably by an independent person with no vested interest in the business.

4. **Business performance monitoring essential**
   - a farm business that aims to be profitable must know production costs for the product or service being offered for sale. Costs will only be known if effective methods of recording data are in place within the business. The information must then be used. Capturing business performance data and not making use of it is pointless. Information allows the manager to focus on areas of the business that are underperforming. Farmer discussion groups have an important role to play in encouraging more farmers to performance monitor. I would suggest that banks and financial institutions consider making business performance monitoring a requirement for loan approval.

5. **Farmers must talk profit, profit, profit**

   - the profitability of a farming business must be the main objective. Gross Margin, whilst important, is production orientated and is only part of the performance monitoring process. Consultants and business development advisors should put less emphasis on Gross Margins when advising farmers. A focus on variable and fixed costs as a percentage of Gross Farm Income is perhaps more relevant and should be encouraged.

6. **The rules of profit must apply when responding to change**

   - the reason **why** a farm business responds to change is critical. Change within a farm business should only happen if the change is based on sound economics. The question should always be : will profit result from the change?. There are two parts to this recommendation:

   - Identification of the global trends and movements within the agriculture and food sector must be a top priority for the Northern Irish farming industry. Funding should be made available immediately to the Agri-Food and Bio-Sciences Institute (A.F.B.I.) to properly resource a dedicated Global Focus Unit. Such a unit is critical to the development of a profitable, sustainable and dynamic farming sector in Northern Ireland.
   - Consultants and other professionals should be encouraged to assist with the dissemination of information coming from the Unit, essentially carrying out the knowledge transfer, whilst helping to facilitate change at individual farm level.

14. What now for me

Completing a Nuffield Farming Scholarship has been a fantastic opportunity to "go see, go learn and go bring home" knowledge from the rest of the world. Knowledge not just about *any* subject but about issues that are of critical importance to the future of farming in the United Kingdom and Northern Ireland in particular.

Having completed my Scholarship travel, gained the knowledge and having reflected on the experience I believe the recommendations in this report can lead to enhanced farm business performance. The six recommendations can be stepping stones to success.

Success within my own farming business and success within other family farms across Northern Ireland will lead to the creation of a dynamic profitable industry that will be "up for the challenges" that lie ahead. Failure will mean we, as farmers, won't be able to do our job - **feeding the world!**

The recommendations within this report that I can **CONTROL** within my own business are:

- A farming business is two businesses not just one.
- Written strategic and risk management plans are essential.
- Business performance monitoring essential.
- Farmers must talk profit, profit, profit.
- The rules of profit must apply when responding to change.

These five recommendations will, as far as practicable, be implemented within my own farming business as soon as possible. To keep me honest during this process I plan to enlist the help of a "critical friend" to regularly review progress.

If implementation of these five recommendations proves to be a *game changer* for my farming business other farmers must be told! Therein lies the opportunity for me to **INFLUENCE** my fellow farmer to do what I have done!

It is possible for me to express **CONCERN** about the remaining recommendation, namely the correct skills set and early control vital for those running farm businesses and attempt to **INFLUENCE** government and educationalists. Following completion of this report I plan to use every means available to achieve this.

Going forward my aim is to have my core farming business provide up to 60% of annual income. Off-farm income will provide the remainder. I believe there to be opportunities to create "income streams" whilst implementing the recommendations in this report across the wider farming sector in Northern Ireland.

Provision of a mentoring or consultancy service are just two possibilities open to me as part of my post Nuffield experience. Agricultural politics is another potential way to reach a wider farming audience as I seek to bring good to the farming industry through these Scholarship findings.

Watch this space…..

15. Thanks

It would have been impossible for me to travel the world without the support of my longsuffering wife Karen and our four beautiful kids. I will be for ever grateful to Karen for "holding the fort" during my absence.

Thanks are also due to my own mother and my wife's parents for supporting Karen during my almost-three months away. All the help is greatly appreciated. My Nuffield Farming Scholarship would have been impossible without all your help.

Sincere thanks are due to the Nuffield Farming Scholarship Trust for selecting me as one of the 2012 United Kingdom Scholars. Travelling extensively throughout the world focusing on the industry I love, agriculture, has been an experience I will never ever forget.

To John Stones, former Nuffield Director for all his help and encouragement before and during the application process as well as the initial part of my study tour, sincerest thanks.

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16. Executive Summary

Having owned and managed my family farm business since 1997, and following completion of a research project a couple of years ago on the future of family farms in Northern Ireland, several issues became apparent to me.

Sentiment rather than business was, and is, a key aspect in the "thinking process" that shapes how farmers in the United Kingdom and Northern Ireland in particular run and manage their farming businesses. Being "risk adverse" and exhibiting low tolerances in terms of responsiveness to change are two other traits that farmers have in abundance.

These thoughts were the catalyst which led me to complete a Nuffield Farming Scholarship application form. Essentially I wanted to explore how family farms in the United Kingdom - and in particular Northern Ireland - really compared with the rest of the world.

The main geographical focus of my study tour was New Zealand (spent 5 weeks), Australia (spent 3 weeks) and South America (spent 2 weeks.) There were two main aspects to the study. These were: comparing and contrasting the business practice within farming businesses in Northern Ireland with the rest of the world, and secondly to evaluate responsiveness to change in farming businesses within this same geographical context.

What quickly became apparent was that, in terms of farmers being good business managers, geography is not the limiting factor – the business competencies of the individuals running the farming units is the issue.

Another take-home message relates to how many farming businesses do any type of business performance monitoring. New Zealand performed best in this regard with perhaps 50% of farm businesses doing detailed performance monitoring. Two out of ten farmers appeared to be average elsewhere around the globe.

A third issue concerned the reasons why, and not if, a farm business responds to change. There are numerous reasons why farmers make changes within their businesses; climatic conditions, subsidies and market focus to name but three. The key message – all change must be governed by application of "the rules of profit."

As the global population increases toward an estimated 9 billion people by 2050, farmers have a critical role to play. After all we do - **feed the world!**

Farmers throughout the United Kingdom have massive potential opportunities up ahead. For farming businesses to fully realise these opportunities it would be useful for all farmers to refer back to the six findings on the title page of this report. To recap, these findings are: A farming business is two businesses not just one: correct skills set and early control vital: written strategic and risk management essential: business performance monitoring essential: farmers must talk profit, profit, profit: and the rules of profit must apply when responding to change.

Were the recommendations contained in this report to be implemented within all businesses the battle cry from our great industry would be – **the best is yet to come!**

So come on **– let's treat farming as a business, let's talk profit, profit, profit.**

Appendix 1

Table 1 Questions to help focus thinking and action in each step of the CI&I process.

Focus	▪ In which areas do I need to concentrate my attention? ▪ What are my improvement goals?
Situation Analysis	▪ What is the situation now – considering what I currently do, and best practices and technologies? ▪ What are opportunities to improve the situation?
Impact Analysis	▪ What criteria will I use to decide the best options? ▪ Which option/s are the best given my goals?
Action Design	▪ What do I need to do to trial or implement the best option? ▪ How am I going to measure and assess any changes?
Action Implementation	▪ Is my plan going as expected, and if not what do I need to do? ▪ Are the measurements starting to indicate any changes?
Results Assessment	▪ What are the overall results from implementation? ▪ Given my goals, is the option worth continuing or expanding?
Creation & Synthesis	▪ What new ideas for improvement do I have? ▪ Am I thinking 'outside the square', and who could help?
Re-Focus	▪ Which areas should I concentrate on next? ▪ What are my new improvement goals?