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RURAL LEADERSHIP  
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# Pasture-Based Corporate Dairy Farming in Zimbabwe – A Concept Plan

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Rob Shaw

I wish to thank the Kellogg Rural Leadership Programme Investing Partners for their continued support.



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# Executive Summary

## Context

The market for dairy products in Zimbabwe, East Africa, and Southern Africa is growing and undersupplied. This paper investigates the dairy foods market, produces three years of financial projections, and investigates the critical success factors behind a greenfield large-scale pasture dairy operation. Investors from the New Zealand dairy industry have developed several projects worldwide, allowing relevant lessons to be used in Zimbabwe.

## Aims

This study produces a concept plan for a corporate dairy farming company in Zimbabwe. It investigates the domestic and regional markets and the general business environment. The final focus is on discovering the critical success factors in developing a corporate pasture-based dairy company.

## Methodology

A mixed method of interviews and secondary financial data was used to investigate the market in Zimbabwe, produce financial projections and develop an understanding of the critical success factors behind foreign direct investment into the dairy farming industry.

## Key Findings

The market analysis indicates that Zimbabwe is a good country in which to develop pasture-based dairy farming on a corporate scale. The domestic milk market is in deficit, land with water is available, and the physical climate is the best in the region for pasture-based production.

The financial projects show attractive returns on capital, a substantial profit margin, and good cash flow. The returns consider the additional risk of operating in Africa, specifically Zimbabwe.

Careful choice of site, understanding of possible grass production, and the availability of supplements are vital in adapting the New Zealand pasture production system. Realistic budgets from the point of view of physical production and financial performance are essential. At the same time, leadership and an understanding of profit drivers are required from the director and farm management levels.

## Recommendations

1. The author should develop the proposal further.
2. The author needs to identify the region of Zimbabwe in which to operate as a prerequisite.
3. The promoter should project Conservative budgets.
4. The promoter must find capital that fits the returns profile.
5. A knowledgeable team must be assembled.

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# 1 Introduction

Sub-Saharan Africa's (SSA) population is forecast to double by 2050 to 2.5 bn people, with some projections showing that the growth rate will continue and the population will reach 4 to 5 billion by 2100 (MacInnes, 2011). The continent is now the only one where population growth is still rapid and will persist for some time due to demographics and age profiles (Pearce, 2011). This increasing population will require a corresponding increase in the volume of food produced. The end of the Cold War in the early 1990s was an inflection point for the continent; a combination of the proxy wars ending and an embracing of free market capitalism kickstarted economic growth. This economic growth has been solid and consistent for most countries across the region and has been in the medium-to-high single figures for twenty years (Bright & Hruby, 2015). The growing incomes of the population result in changing diets and growing protein consumption in the form of dairy and meat (Bright & Hruby, 2015).

Zimbabwe had a thriving dairy industry before the 2000 land reform. It even exported award-winning cheese to Europe. The land reform decimated the industry throughout the value chain (Chirinda et al., 2021). This report starts by investigating the context of the African food market and the drivers for growth. It then produces three years of financial projections using South African data adjusted for known Zimbabwean cost differences. Finally, it investigates the critical success factors around pasture-based corporate dairy farming investment.

New Zealand dairy farmers and investors have started and grown pasture-based corporate dairy farming ventures domestically and globally, specifically in North and South America. Not every start-up has been successful; some have failed, while others have had to be refinanced or have not produced economic profits. Financial projections showing attractive returns are easy to produce, but successful implementation of plans is more complicated. This concept plan investigates the critical success factors and potential failure points to avoid. Secondary data was used to complete three years of financial projections. The data was based on historical results from South African dairy farms with adjustments made for the different costs and income in the Zimbabwean market. Semi-structured interviews were conducted, the results of which were used to identify the critical success factors and the failure points when developing a large-scale pasture dairy farming business. The combination of the two research methods allowed the development of a concept plan for developing a dairy business in Zimbabwe. The study does not consider the downstream value chain as a processor. It does not consider how the necessary resources/competencies to develop a capability and ultimately give a strategic competitive advantage are acquired.

## 1.1 Aim

This study develops a concept plan for a corporate dairy farming company in Zimbabwe. The focus will be on discovering the critical success factors from previous New Zealand-founded projects overseas.

## 1.2 Research Questions

- 1) What is the context behind a dairy foods business in Zimbabwe?
- 2) What are the expected financial returns over three years?
- 3) How do I build a thriving corporate dairy farming company in Zimbabwe?

## 1.3 Objectives

- 1) Investigate the dairy food market in Zimbabwe.
- 2) Produce three years of financial models.
- 3) Explore the critical success factors behind previous projects.
- 4) Identify the reasons for poor performance or project failure.

## 1.4 Motivation

As the researcher is intensely interested in the dairy and African agri-food industries, this project provides an opportunity to develop a concept plan for launching a dairy foods business in Zimbabwe. The researcher will subsequently move forward with the implementation. The continent is a difficult place to conduct business, and this plan will allow an investigation of the factors that will improve the chances of success. Success will result in job creation, import substitution, and export opportunities for New Zealand and regional exports.

## 2 Literature Review

Leke (2021) states that over 80% of Africans are subsistence farmers. They survive on food they manage to produce themselves, and they have deficient cash income levels. They live on exceedingly small land areas, from as little as ½ hectare to 2 hectares, without secure tenure or access to modern farming techniques. Moreover, farm inputs are unavailable through an upstream value chain, and downstream routes to the market are challenging. Even if access was available, they have no working capital. The Food and Agriculture Organisation, UN, governmental bodies, and many private Non-Governmental Organisations (NGOs) have produced reams of reports analysing the food supply/demand imbalance and poverty of subsistence farmers. The solutions developed and implemented have yielded few results. Food prices are still high, imports dominate the higher-value product lines, and the processing and marketing industries are hindered. Farmers still have a difficult life on the verge of poverty (Moyo, 2009).

Table 1 Percentage of Africans at Different Daily Income Levels (US\$)

<\$2 per day	\$2–\$4 per day	\$4–\$10 per day	\$10–\$20 per day	>\$20 per day	TOTAL
60.9%	20.9%	8.7%	4.7%	4.8%	100%

(AFDB, 2011)

Vertical integration typically provides little economic benefit, especially in complicated supply chains with many weather factors outside control (Stuckey & White, 1993). However, dairy and meat of the correct quality and quantity are impossible to find being produced domestically in most countries. This leaves little option but to have a ‘farm to fork’ model, where primary production is processed, packaged, and marketed to the consumer under one ownership.

### 2.1 The Economic Case

The year 2000 was a turning point for Africa economically, with 20 of its 30 largest economies experiencing a rapid increase in GDP growth. By 2008, the African GDP equaled that of Brazil or Russia. Natural resources were a key driver of this economic growth, facilitated by political and macroeconomic stability and microeconomic reforms (Roxburgh et al., 2010). A big question is whether African countries can maintain their economic growth when commodity markets are in a downward cycle.

## 2.1.1 Population Growth

As Leke (2021) states, Africa contains the world's fastest-growing population, at 1.25 billion in 2022 and forecasted at 2.5 billion by 2050. It also has the largest youth population, with a quarter of the population between the ages of 15 and 24, a key driver of total population growth. A secondary driver is longer lifespans; Kenya's life expectancy has doubled since the 1980s.

The population's geographic location is also crucial: 80% live in rural areas and practise subsistence agriculture. However, this is changing rapidly. Over 3% of the population relocates to an urban environment every year. This creates the world's fastest-growing consumer class and expands spending power (Leke, 2021).

Table 2: Population Demographic Projections

Year	Population	Yearly Change %	Fertility Rate	Urban Population %
2020	1,340,598,147	2.54	4.44	43.8
2025	1,508,935,218	2.39	4.48	46.3
2030	1,699,321,099	2.27	4.53	48.8
2035	1,878,193,685	2.15	4.57	51.4
2040	2,076,749,529	2.03	4.61	54.2
2045	2,281,452,464	1.90	4.65	57.0
2050	2,489,275,458	1.76	4.69	59.8

(United Nations, Department of Economic and Social Affairs, Population Division)

## 2.1.2 Economic Growth

Although the post-2000 resource boom was a key driver of GDP growth, 68% came from wholesale, retail, transportation, telecommunications, and manufacturing (Leke, 2021). As access to roads, electricity, education, and markets improves, living standards for the population will grow (Leke, 2021). In 2016, African consumer and business spending was US\$4 trillion annually, growing at nearly 4% annually (Bughin, 2016). Currently (2022), the continent imports one-third of the processed food it consumes. Processed food is open to domestic production, while manufacturing is forecast to double by 2025 (Bughin, 2016). A fall in global mineral demand and prices can cause wide swings in the economic performance of mining-focused countries. Zambia is, in particular, affected by copper prices.

Table 3 Percentage Share of GDP Growth and Annual Rate of Growth

Sector	Share of GDP Growth %	Compound Annual Rate %
Resources	24	7.1
Wholesale and Retail	13	6.8
Agriculture	12	5.5
Transport and communications	10	7.8
Manufacturing	9	4.6
Financial services	6	8.0
Public Administration	6	3.0
Construction	5	7.5
Business Services	5	5.9
Tourism	2	8.7
Utilities	2	7.3
Other Services	6	6.9

(Roxburgh et al., 2010)

## 2.2 Food Production

Food production is at a turning point in Africa; it never experienced the green revolution like the rest of the world, where scientific farming methods allowed rapid increases in labour and land productivity. The result is a fluctuating food supply dictated by the weather, resulting in high and volatile prices (Bughin, 2016). Global cereal production is forecast to rise by 43% and meat production by 74%, so the opportunity is not just for the domestic market but for export (United Nations, 2009). This UN assertion would require a complete upgrade of road, rail and port logistics to be export-competitive. Indeed, Africa contains 60% of the world's undeveloped agricultural land. This offers significant scope for creating a large-scale competitive export industry (Savills, 2013). However, a criticism of Savill's report is the lack of clear title and property registration and the existence of many traditional tenure structures under village chiefs. Subsistence farmers settle a lot of potentially productive land. Relocating them is expensive.

### 2.2.1 Small Holder Farmers

Smallholder farmers in SSA face significant challenges, leading to an annual average crop yield that is only 50% of comparable regions. The primary issue is their lack of secure tenure, which

hinders their ability to invest in machinery, irrigation, and high-yield seeds. Even if these financial barriers were overcome, the high administration and logistics costs of collecting small volumes from a large number of producers using poor infrastructure remain prohibitive (Shanghvi, 2011).

### 2.2.2 'Western' Food

It is well documented in Asia that economic and income growth combined with urbanisation leads to a shift in diets from traditional staples to protein in the form of meat and dairy products—this transition results in a convergence with the Western diet. The diet transition is characterised by increased consumption of wheat, temperate fruit and vegetables, and high-protein and energy-dense food. The global interconnectedness of the urban middle class, enhanced by the internet, is the main driver behind the convergence of diets (Pingali, 2007).

The shift towards the Western diet, driven by increasing global incomes and urbanization, is not unique to Africa. However, meeting the demands of this diet requires significant changes to the existing food supply chain. Modernizing the food retail sector and integrating the food supply chain are crucial steps in linking consumers to farmers and ensuring a sustainable food supply (Pingali, 2007).

### 2.2.3 Dairy Imports

Knipps (2006) found that the fact that dairy products are perishable means high rates of domestic production and low levels of international trade are inevitable. However, any existing dairy trade comes from the developed countries of Europe, the Americas, and Australia/New Zealand, which export milk to Africa and Asia, as well as tropical and sub-tropical regions where elevated temperatures and high humidity make primary production difficult. Dairy cows need temperatures below 20°C to be healthy and productive. Higher temperatures and high humidity cause heat stress, resulting in low productivity and health issues. The import dependency varies quite dramatically across the African continent but ranges from 0% in South Africa to 100% in some West African countries. The Tanzania Milk Processors Association 2016 calculated that Tanzania imported about 50% of its dairy food requirement; a similar figure was suggested for Zimbabwe (Chirinda et al., 2021). Companies commonly import cheaper skimmed milk powder, which they fortify with vegetable fats. While this allows low cost, it also means that low-quality reconstituted dairy products are produced (Knips, 2006).



## 2.3 Dairy Production Systems

There are two extremes of dairy production in practice around the globe. However, the fundamental principles for all methods are always about converting energy, protein and dry matter into milk solids and water.

Firstly, the 'North American' feedlot system focuses on maximum output per individual cow. This model involves keeping the animals in an environment-controlled building and feeding them a perfect diet for maximum milk production. Maximum efficiency is achieved through spreading overheads over the maximum output per animal. This system is growing in popularity worldwide and is even influencing countries where a comparative advantage can be achieved because of the ability to grow perennial ryegrass. Secondly, the 'New Zealand' system is based on maximum milk output per hectare of grassland, and the cows are treated as herds. Traditionally, cows are grazed on pasture with minimal supplements; however, increasing use of other feeds has become prominent (Dairy NZ, 2023). Efficiency is achieved by eliminating overheads and operating costs and reducing the cost of production. This production system was pioneered in New Zealand but has spread throughout the world in temperate regions with the ability to grow grass reliably, such as South America, Ireland, and parts of the UK (Dentler et al., 2020).

Arnott et al. (2015) have completed research on the economics of feedlot and grassland systems. Most countries have adopted one system exclusively, although Northern Ireland has adopted both. They found that both systems, done well, can be profitable; however, a feedlot system requires a higher management level, and a grassland system has lower production costs and risks. A similar study was completed in Pennsylvania, USA, which still has grazing farms. That study also identified lower costs, higher profitability, and lower risk (see Table 4). The studies were based on feedlot systems compared to grazing systems, which were more of a hybrid system rather than a complete one, limiting the accuracy of the results (Hanson et al., 2013).

Table 4 Economic Comparison of Feedlot and Grazing Dairies in Pennsylvania

Economic Measure	Feedlot US\$	Grazing US\$	% Difference compared to Feedlot
Total Income Per Hectare	2,214	1,635	-26
Total Expenses Per Hectare	1,926	1,270	-34
Profitability Per Hectare	288	365	27

Financial Risk (measured as profit in 3 out of 4 years)	16,644	23238	40
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(Hanson et al., 2013)

### 2.3.1 The Predominance of Feedlot Dairy Systems

Clay, Garnett, & Lorimer (2020) found that feedlot dairy farming was developed in North America; this was driven by the Second World War predominance of scientific methods being used to intensify production. This made sense in a world suffering from food shortages and high prices. An intensification of dairy production spread from the USA and was actively adopted by most European countries except for Ireland. The Irish Government had realised its competitive advantage lay in its New Zealand-style climate and that it should be harnessed by adopting grass-based dairy systems. This productivist mindset among farmers has persisted even though the supply/demand balance and economics have changed. Kriegl (2001) suggested that the large number of suppliers in feedlot dairies has driven academic research – encouraging the status quo and further intensification. The few suppliers of a grass-fed dairy system result in little academic research and few voices advocating for grass-fed systems. New Zealand and the South American countries where grass-fed production persists are driven by their reliance on export markets. Indeed, New Zealand exports a significant portion of its production. The lowest-cost production methods have been maintained to maximise margin and reduce risk during periods of weakness in the world dairy markets). The big drawback of grass-based dairy systems is the requirement to have large contiguous blocks of land to which the cows can walk and graze. In contrast, they can still go for daily milk harvesting in a parlour – along with the requirement for a climate where both forages can be grown and cows can be productive. Grass-based production is only possible and is only cost-effective when it can be grown efficiently and utilised efficiently by cows (Beca,2020).

### 2.3.2 Primary Dairy Production in Sub-tropical Climates

Sub-tropical climates are not hospitable to the world's productive dairy breeds as they struggle with elevated temperatures and humidity. Elevated temperatures can be managed using evaporative cooling, which requires capital expense and reliable electricity supplies. Elevated temperature and high humidity combined can be managed by adding expensive extra fans working on the tunnel ventilation effect and high airspeed. The energy cost and reliance on electricity are more prohibitive again. Achieving import parity is exceedingly tricky. The easy solution in such countries is to select high-altitude areas that temper the climate to maintain productive livestock (Knips, 2005). This is one of the main reasons Zimbabwe was preselected for this development.

### 2.3.3 The Case in South Africa

The neighbouring country to the south of Zimbabwe is South Africa. It has maintained a thriving dairy industry and has sustained demand in its growing domestic market, which has risen by 2–3% per year (Abin et al., 2014). The dairy industry has experienced a sea change since the late 1990s when it was deregulated and the marketing board was broken up (Scholtz & Grobler, 2008). At that point, 70% of the South African industry utilised feedlot systems. Deregulation and falling producer prices have caused a shift towards New Zealand-style grass-based systems (Scholtz & Grobler, 2008). The change occurred for two reasons: firstly, lower production costs allowed farmers to remain profitable at the lower milk price, and secondly, it allowed scaling up the size of farms without large injections of capital in fixed assets (Theron & Mostert, 2009).

### 2.3.4 Zimbabwean Systems

Before 2000, Zimbabwe had a relatively large dairy industry, exporting dairy products across the region and even award-winning cheese to Europe (Marecha, 2009). The year 2000 saw a land reform project which eliminated 90% of commercial farms over 12 months. This had a massive effect on the whole food value chain, knocking out upstream input suppliers and downstream processors and marketers. The dairy industry now has 7–10% of its former size, and large amounts of milk powder are imported to fulfil demand (Kagoro & Chatiza, 2016). The production systems used are predominantly feedlot dairies – the most common systems throughout East Africa. Two grass-based dairy farms now exist, however, developed since 2017 (Kagoro & Chatiza, 2016).

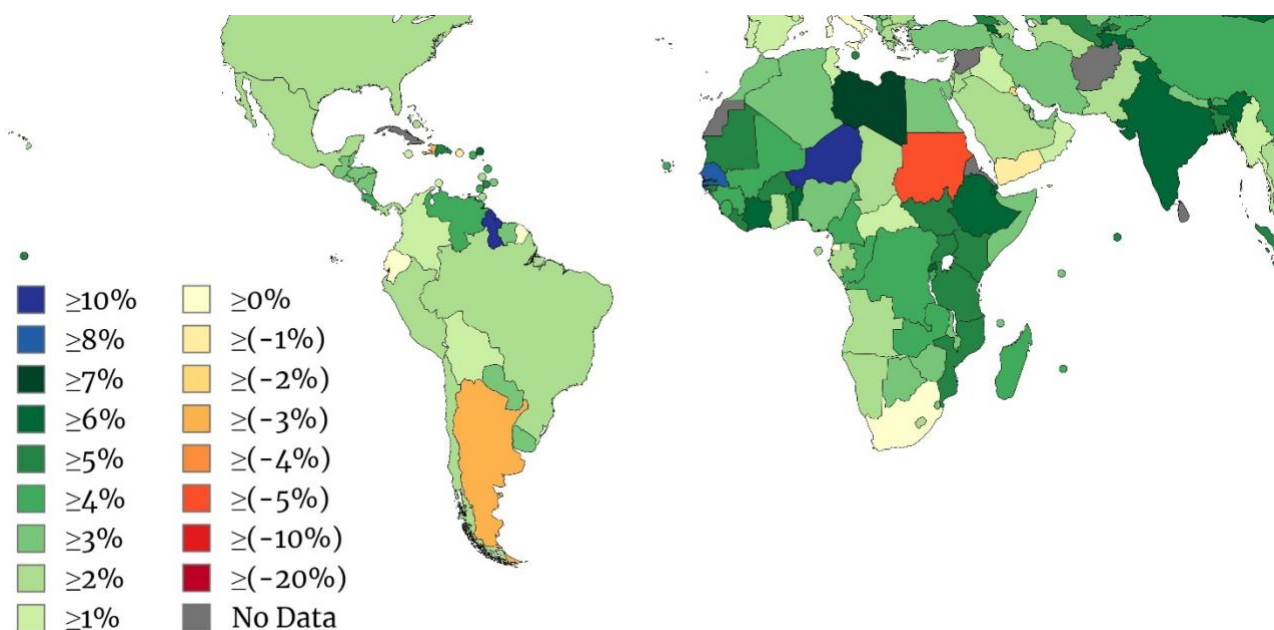
## 2.4 Why Zimbabwe

A key reason for setting up a dairy foods business in Zimbabwe is access to land with water. It is possible to access large amounts of land across the Sub-Saharan Africa region of suitable scale for commercial farming. However, the majority is not suitable because of a lack of access to water, power, roads, and communications infrastructure. These factors are a requirement for commercial farming; often, large blocks of land are available with access to water, but they are in remote locations where no power is available, and road access is impossible in anything but the dry season. Suitable land was either unavailable in large, efficient blocks or prohibitively expensive. Zimbabwe was unique in having large blocks with good access to communications, power, and water; this resulted from the 2000 land reform.

## 2.5 Food Imports

According to Bjornlund, Bjornlund, and Van Rooyen (2021), the population across the SSA has grown, and GDP has risen. The protein production of meat and dairy has struggled to keep pace with growing middle-class demand. Moreover, claim Tschirley & Jayne (2010), government policy, difficulty accessing capital, poor infrastructure and inadequate disease control have contributed to (or perhaps exacerbated) this problem/ situation.

Figure 1 African GDP Growth Rates



Countries by Real GDP Growth Rate in 2023 (Data from IMF WEO Database, April 2024)

### 2.5.1 Climate – Pests and Disease

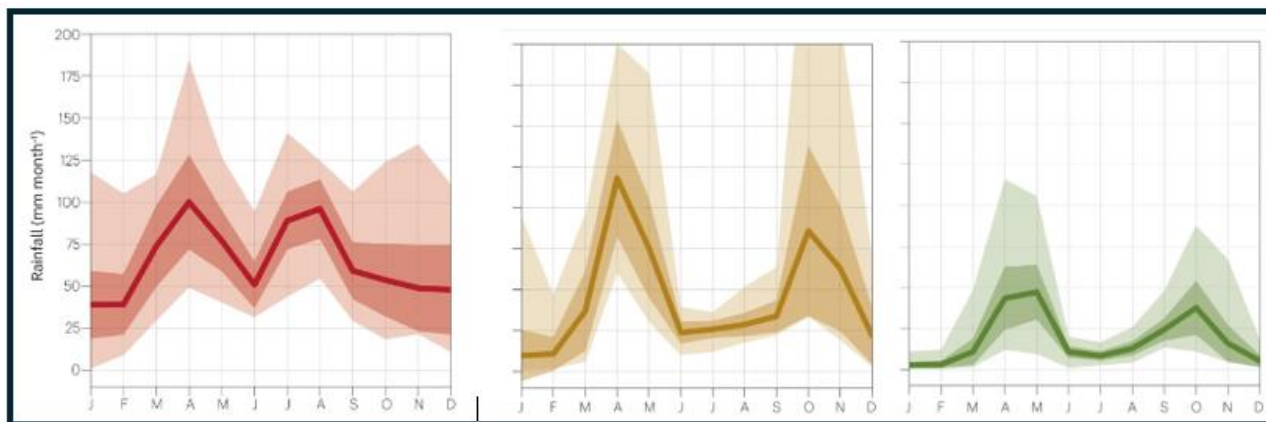
Pests and disease are significant issues in East Africa. The Tsetse fly, in particular, is an endemic parasite in the subtropical areas of Africa and is a significant hindrance to livestock production. Access to medication and the correct control plans can control it, along with the various livestock diseases prevalent in the region (Rakotoarisoa, 2011).

### 2.5.2 Climate – Water

The variable seasonal nature of the rainfall pattern creates production problems and increases risk. There tend to be two periods of rainfall, known as the ‘short’ and ‘long’ rains, which create difficulty in achieving productive yields of animal feeds without resorting to irrigation. Irrigation infrastructure requires substantial capital and a reliable electricity supply (Rakotoarisoa, 2011). Year-round

grazing is required to operate a grass-based dairy system, but the irrigation required is a high capital cost. However, it can also act as insurance, protecting the farm from drought if relying on rain-fed production.

Figure 2 Rainfall Distribution in Three Different E. African Regions



Gamoyo, M., Reason, C. & Obura, D. (2015)

### 2.5.3 Logistics Cost – Import Parity

The lack of navigable rivers on the African continent has long been recognised as a significant reason for its lack of development (Sowell, 2016). As a result, the predominant method of logistics is trucking on roads. The roads are of inferior quality, especially in the wet seasons, creating difficulties and resulting in very high transport costs. The land-locked countries of Africa spend a disproportionate amount on imported goods. The situation will continue until investment is made in road, rail, communications, and other infrastructure (Diao & Dorosh Rahman, 2003). As a significant amount of skimmed milk powder is imported to meet the demand for dairy food, this high logistics cost increases the milk price in Zimbabwe significantly above the world market price (Kagoro & Chatiza, 2016).

### 2.5.4 Vested Interests

Corrupt vested interests connected to and including the political elite control the import of food – either directly through ownership of companies importing the food or indirectly through bribes. Import licences and restrictions, along with the requirements for bribes, allow opportunities for unscrupulous politicians to generate significant wealth (Sequeira & Djankov, 2014). These circumstances can create a monopoly or oligopoly situation and allow excess profits. However, the opposite can also be true. Imports can be encouraged, undercutting the nascent local producers before they have a chance to gain economies of scale (Rakotoarisoa, 2011).

## 2.5.5 Dairy Foods

The self-sufficiency in dairy production is seen in wide variation across East Africa. Only Uganda is an exporting country; the rest are net importers. Zimbabwe, Mozambique, Tanzania, the Democratic Republic of Congo (DRC), Botswana and Malawi all import significant amounts due to climate, logistics or the political environment (Abdulsamad et al., 2016).

## 2.6 Previous New Zealand Foreign Direct Investment

Over the last twenty years, various New Zealand-managed and funded projects have been undertaken across North and South America, specifically in Uruguay, Chile, Brazil, Missouri, and Oregon. Some of these projects have been very successful and continue to grow today, while others have only just survived. There have also been some failures.

It has been suggested that the critical factors in the success of large-scale pasture dairying are:

- 1) The ability to adapt the NZ system to the environment in the chosen country. New Zealand has a unique climate ideal for rain-fed year-round grass production and pasture-based dairy farming; the Canterbury Plains utilises productive irrigation to achieve high pasture growth rates (Dairy NZ, 2023). Few other countries have as ideal a climate, and the continental climate in similar areas lacks year-round reliable rainfall. This necessitates irrigation, which increases the cost of grass production and the use of supplements, although supplement costs can be lower (Wilson & Rowarth, 2013).
- 2) The availability of other ancillary support services. New Zealand has developed an all-encompassing ecosystem of support services through the value chain, aiming to make the industry efficient and low-cost. This is accurate for NZ, whose key market is export and export competitiveness. However, in most other countries, the dairy foods industry is more domestic-focused, and the key is being domestically competitive (Wilson & Rowarth, 2013).
- 3) A pool of staff with the requisite knowledge and skills. I wonder how true this is. Indeed, management must understand and have a pasture growth and management skill set. However, the general work can be completed with a relatively low skill set but an aptitude for diligence. The correct initial leadership would seem vital in training the local population in the skills and knowledge and developing a pipeline of managers to take over the daily operations and continue growth. Good leadership would seem to be one of the keys to success in the successful Chilean project and Leite Verde in Brazil (Wilson & Rowarth, 2013).

- 4) Realistic budgeting regarding time frames, technical productivity, and potential setbacks. Creating intricate spreadsheets showing attractive returns is easy. The key to the accuracy of any spreadsheet is the assumptions made at the input level; expecting good technical and financial performance from day one without any problems was a critical factor in poor returns or failure of projects. The massive project in Uruguay failed because this factor was a fundamental cause. Over-optimistic plans about the performance were never achieved. This, combined with the failure to stick to the strategic plan and accelerated land banking, created a requirement for refinancing (Wilson & Rowarth, 2013).

A criticism of Wilson and Rowarth's (2013) paper is their reliance on previously published articles in industry media and limited interviews with project stakeholders. However, their findings generally align with business wisdom on start-up and development projects.

## 2.7 Conclusion

The literature review has provided an academic framework to facilitate an understanding of the dairy foods market in SSA. The population is proliferating, and economic growth is increasing middle-class consumers and changing diets. Food production of proteins and dairy fails to meet demand; thus, imports are filling the gap. Imports remain expensive – logistics being the high cost. Limited studies have been undertaken on the reason for the success and failure of large-scale pasture-based dairy farming, with a reliance on lower-quality publications for the data. Planning is easy, implementation is complex and over-optimistic plans can never be achieved. Three critical success factors seem to be adapting to the NZ system, having exemplary leadership, and realistic performance objectives and time scales. As discussed earlier, Africa is a very challenging political and economic environment in which to operate a business, and its extreme climate does not help it.

## 3 Methodology

### 3.1 Literature Review

A situational analysis was conducted through a comprehensive literature review to analyse the current state of the African demographics and food industry and investigate the macroeconomic factors affecting the dairy sector. The literature review introduced and critically analysed the relationship between the drivers of agricultural demand. Various sources were used in the literature review, including published reports, market reports, peer-reviewed research papers, data banks and reputable websites. The essential data and information were primarily sourced from The Food and Agricultural Organisation (FAO), The World Bank, The United Nations, The United States Department of Agriculture and the African Union.

### 3.2 Financial Forecasting

Quantitative forecasting was used to produce the three primary financial statements - the income statement, cash flow statement, and balance sheet. The projections were produced using adjusted historical and comparative data from South African dairy farms.

### 3.3 Semi-Structured Interviews

Lynch (2020) found that the most appropriate framework to adopt to analyse the external environment is Porter's Five Forces. Gillespie (2007) found that understanding the six factors of Pestel will facilitate successful strategic and operational planning. Pestel Analysis were populated with the author's interviews on trips to East Africa in 2021 and 2022. The interviewees in these cases were happy to have their details published. Appendix 1 outlines who the interviewees were and what their backgrounds were, and a total of fifty-nine interviews were completed.

A semi-structured interview was developed to gain further insights into historic foreign direct investment in emerging market dairy industries. The questions were structured into nine main areas of focus: Background, Context, Existing Commercial Agriculture, Infrastructure, Capital, Land, Pasture, Cows, Governance, and Staff.

The initial questions sought a comprehensive understanding of the interviewee's background, involvement in the project and the main drivers behind the investment. Secondly, questions were asked to identify the agricultural and critical infrastructure in the designated country. Next were questions about the land and capital structure of the investment. Fourthly, technical questions were



asked about pasture and the cows. The final questions concentrated on issues around leadership, governance, and staffing.

A range of interviewees were engaged, from successful and continuing investments to those that were less successful or failed. Eight interviews were conducted, representing projects in Uruguay, Chile, Brazil, Missouri, Oregon, India, Russia, and New Zealand. Interviews were conducted via Microsoft Teams or by phone call, and with consent, they were recorded and transcribed.

Due to the complex and sensitive nature of the investments and the fact that some were failures, it became apparent that it was crucial to preserve anonymity to allow for free and frank interviews. This means that roles and geographic identifiers are not disclosed.

### **3.4 Thematic Analysis**

Thematic analysis is a qualitative research method used to identify, analyse, and report patterns within data (Braun & Clarke, 2006). Thematic analysis was employed to draw out key themes from the literature review and interviews using an inductive approach. To capture the key messages from the interview transcripts, a spreadsheet was used to collate and record the relevant information under key topics. Thematic maps were created using the Miro website to condense the final themes and illustrate the connections. This supplied the foundation for discussion and insights.

### **3.5 Limitations**

Several limitations detailed below were encountered during the data collection process and, therefore, need to be considered when interpreting findings and drawing conclusions.

#### **3.5.1 Sample Size**

A small number of qualitative interviews were completed. This reflects the small number of FDI projects and the reluctance of the less successful examples to talk.

#### **3.5.2 Data Integrity**

Sourcing complete and accurate data on Zimbabwe was challenging due to the limited number of commercial farms and lack of data recording. The best possible data was sourced from a South

African dairy consultancy using farms of a similar climate and geography, adjusting these with known Zimbabwean facts. The bias of this data may affect the accuracy of the financial budgets in that the sources are all forward-thinking operators who engage in the services of a consultancy.

### **3.5.3 Time Constraints**

A final limitation was the limited ability to spend more time interviewing further projects, both successful and unsuccessful.

## 4 Results and Analysis

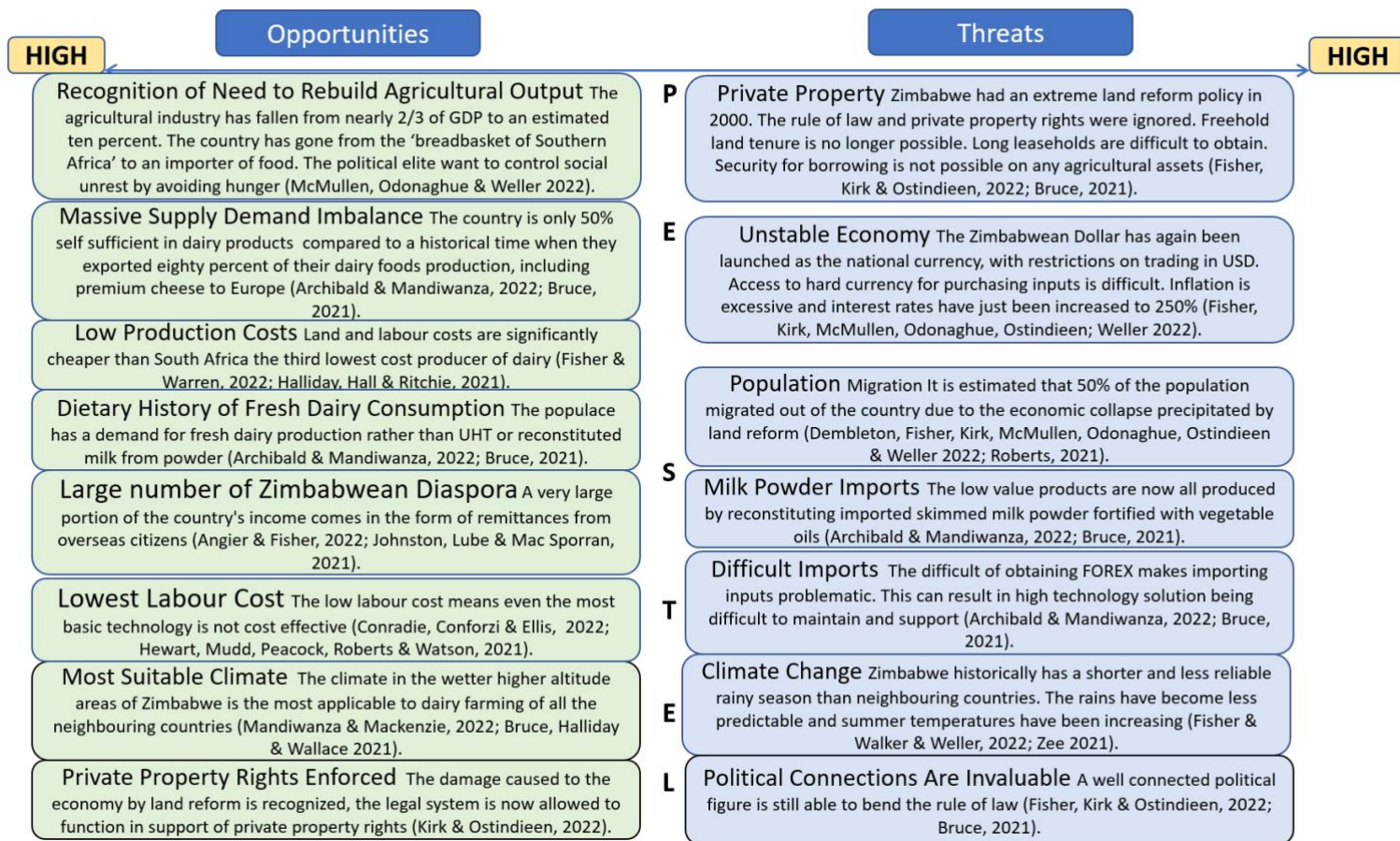
Firstly, PESTEL and Porter's Five Forces models have been completed using information gathered from interviews with industry figures in Zimbabwe. The list of those interviewed and referenced in the tools is in Appendix 1. These tools consider other factors that govern a large-scale venture's success in Zimbabwe. Second, the indicative financial projections for a model thousand-cow dairy farm are presented. The assumptions used were based on data obtained from South Africa and adjusted to suit local costs; three years of projections were completed. Finally, interviews were conducted at the director level with those involved in corporate dairy farming in Chile, Brazil, the USA, Tasmania, New Zealand, China, Russia, and Uruguay. Most of these projects were pasture-based systems, either started or operated by New Zealanders. The interviews aimed to investigate the critical success factors in developing corporate dairy farming and the problems that cause failure.

### 4.1 Investigate the dairy food market in Zimbabwe.

#### 4.1.1 PESTEL Analysis

Political, Economic, Social, Technological, Environmental and Legal analysis was developed using personal communication the author had with Zimbabweans and those familiar with the region over the last three years. This provides a Macro-level overview of the climate for investment in the Zimbabwe dairy foods industry.

Figure 3 PESTEL Analysis for Dairy Production Company in Zimbabwe



The land reform and subsequent collapse of agriculture created a massive opportunity for new entrants. As reform was completed by suspending private property rights, and original title deed holders are still legally the rightful owners, a situation has been created where freehold titles exist but cannot be enforced. As a result, land has no value, and labour is cheap (Fisher & Warren, 2022; Halliday, Hall & Ritchie, 2021). The previously established commercial farming industry means large blocks of land are available, unlike in other subsistence-farmer-populated countries (Fisher, Kirk & Oostindieen, 2022; Bruce, 2021). High-altitude central and eastern Zimbabwe has one of the best regional climates for ruminant livestock, with reasonable temperatures and adequate if seasonal, rainfall (Mandiwanza & Mackenzie, 2022; Bruce, Halliday & Wallace, 2021). Property rights are now being enforced, but governance and political risk are still problems; investment in non-moveable assets is unwise (Kirk & Oostindieen, 2022). The unstable economic climate and currency issues mean managing any business which relies on imports and large amounts of inputs is difficult (Fisher, Kirk, McMullen, O'Donoghue, Ostindieen & Weller 2022). The high domestic supply/ demand imbalance creates an excellent local market, and there is potential to relaunch regional exports based on past successes (Archibald & Mandiwanza, 2022; Bruce, 2021). The land reform and economic collapse resulted in a large migration of skilled workers


overseas, where their high educational standards and culture of diligent working are in demand (MacSporran, 2021).

#### 4.1.2 Porter’s Five Forces

The five forces analysis considers investment in the dairy foods industry at the industry level, including buyers, existing rivals, potential Entities, suppliers, and substitutes (Lynch, 2020). It was populated using personal communication the author had with Zimbabweans and those familiar with the region over the last three years.

Table 5 Porter’s Five Forces for Dairy Production Company in Zimbabwe

Force	Threat Level	Why?
Buyers	LOW	The dairy industry in Zimbabwe is struggling for raw milk supplies, and producing high-quality raw milk is like ‘white gold’! There are four leading dairy companies and numerous other small-scale processors. The retail market is split between formal retail, informal and street vendors. The public prefers fresh dairy products to UHT and reconstituted milk powder products; about 50% of dairy products are produced from reconstituted milk powder. Zimbabwe dairy products were at one point considered world-class, with a vibrant export industry in the region and as far afield as Europe (Archibald, Conradie, Follwell, Hawgood, Kirk, Mandiwanza, Oostindien, Philip, 2022; Mitchel, Webster & Bruce, 2021).
Suppliers	HIGH ↓ LOW	The collapse of primary milk production from a national herd of 250K cows to 20K cows has hollowed out the upstream supply chain. Compound animal feed is expensive due to a shortage of raw materials. Co-product animal feeds are in short supply due to the collapse of the horticultural industry. Competition from the bread-milling industry for cereals is a strong competitor for animal feed. Nutrition and veterinary support and supplies are in limited supply. Plant and machinery supply and repair are non-existent for dairy equipment and limited for general farming equipment. The correct choice of production system and achieving scale in the industry can move the threat level from High to Low (Archibald

		Dembleton, Fisher, Follwell, Hawgood, Hulbert, Kirk, Mandiwanza, Oostindieen, Philip, 2022; Bruce & Roberts, 2021).
Substitutes	HIGH  MEDIUM	Approximately 50% of the dairy requirement is supplied by imported milk powder reconstituted and fortified with vegetable oils. The decimation of the broader economy has reduced the standard of living and hollowed out the middle class, making cheaper substitutes more affordable. The populace still values a quality fresh product. When money is tight, people resort to maize meal and milk porridge, dropping expensive meat and eggs. South African (SA) dairy production is significantly cheaper; however, SA producers struggle to keep up with domestic growth. If an appropriate business model is chosen and scale can be achieved, cheaper land and labour should give Zimbabwe price parity with SA. Milk powder requires hard currency to import, another general economic issue. These factors can reduce the threat from High to Medium (Archibald, Follwell, Kirk, Mandiwanza, Oostindieen, Philip, 2022).
Existing Rivals	LOW	All dairy processors are struggling to maintain production and meet market demand due to a raw milk supply/demand imbalance. They sell milk in Zimbabwean dollars but need USD to purchase inputs and spare parts. Utilising milk powder also requires USD. The businesses all struggle with management's ability. Businesses have fought since 2000 to survive; they are demoralised and defensive. Some existing companies have suggested political connections, which may be a threat (Archibald, Follwell, Kirk, Mandiwanza, Oostindieen, Philip, 2022).
Potential Entrants	LOW	Significant capital investment is required to develop a competitive dairy business. The skills and knowledge for managing primary production and processing are non-existent, the human resources having left twenty years ago. Dairy foods are perishable, reducing the attractiveness for domestic and foreign investors. Livestock is seen at very high risk from pests, disease, and theft, also reducing

		its attractiveness to investors (Angier, Holliday, Mackenzie, 2022 & Akinyi, Benton, Bernardi, Grobber, Hari, Hewart, Johnston, Lube, Stubbs, Tyrell & Turnbull 2021).
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There are only a small number of milk buyers/ processors in Zimbabwe, which usually means a high threat level, but they are all desperately short of milk. The downstream value chain is fragmented, creating opportunities to set up processing and move further down the value chain. The country has a history of fresh milk consumption, and reconstituted milk is not favoured. The threat level from suppliers is high; the collapse of the agriculture industry after the land reforms has decimated the upstream supply chain. Reconstituted milk powder makes up for the undersupply of raw milk. Skimmed powder fortified with vegetable fats is low-cost but produces low-quality products that are recognised as such. Importing milk powder requires hard currency and is subject to fluctuating world prices, reducing the threat of substitutes. The market is undersupplied, and most producers use feedlot systems that struggle with the availability of inputs (Archibald et al., 2022; Bruce et al., 2021). Debt finance is not available, nor is hard currency required for expansion; therefore, the threat from rivals is low. The livestock industry, and ruminants in particular, is considered a high-risk investment; it is not considered an attractive investment for new entrants (Angier et al., 2022; Akinyi et al., 2021).

## 4.2 Financial Analysis

The following financial projections were developed using data from a South African dairy consultancy, adjusted for known Zimbabwean costs. As a result, the currency is in RAND.

Current Exchange Rate 1US\$ = 17.91 SA Rand

Table 6 Projected Income Statement for Model 1000 Cow Farm

Income Statement	Year 1	Year 2	Year 3
Milk Sales	67,211,538	70,708,092	74,204,646
Stock Sales	960,000	996,000	1,080,000
Cost of Sales	19,298,935	17,063,087	17,092,918
<b>Gross Profit</b>	<b>48,872,603</b>	<b>54,641,005</b>	<b>58,191,728</b>
Operating Expenses	18,147,115	16,050,737	16,102,408
<b>EBITDA</b>	<b>30,725,487</b>	<b>38,590,268</b>	<b>42,089,320</b>
Depreciation & Amortization	1,666,667	1,666,667	1,666,667
<b>EBIT</b>	<b>29,058,821</b>	<b>36,923,601</b>	<b>40,422,653</b>
Finance Cost	8,439,306	7,908,964	7,317,250
<b>NPBT</b>	<b>20,619,515</b>	<b>29,014,638</b>	<b>33,105,403</b>
Tax	4,509,488	6,345,501	7,240,152
<b>Profit for the Year</b>	<b>16,110,027</b>	<b>22,669,136</b>	<b>25,865,251</b>



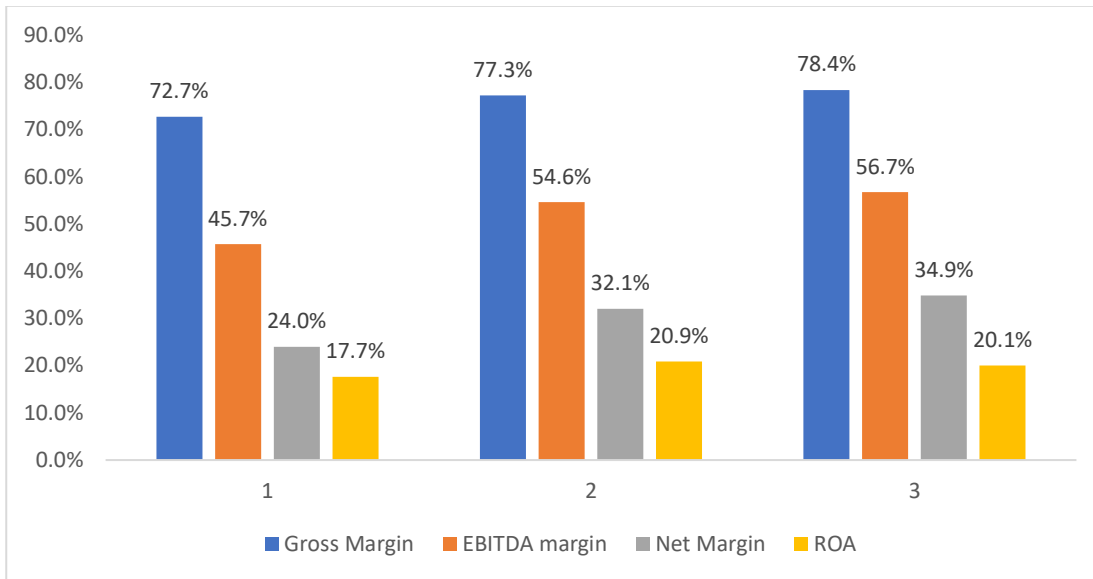
Table 7 Projected Balance Sheet for Model 1000 Cow Farm

Balance Sheet	Year 1	Year 2	Year 3
<b>Non-current Assets</b>			
Biological Assets	28,333,333	26,666,667	25,000,000
	-	-	-
<b>Total Fixed Assets</b>	<b>28,333,333</b>	<b>26,666,667</b>	<b>25,000,000</b>
	-	-	-
<b>Current Assets</b>			
Inventory	793,107	701,223	702,449
Receivables	368,282	387,442	406,601
Other assets	-	-	-
Cash	61,605,382	80,808,654	102,616,328
<b>Total current Assets</b>	<b>62,766,772</b>	<b>81,897,319</b>	<b>103,725,378</b>
<b>Total Assets</b>	<b>91,100,105</b>	<b>108,563,985</b>	<b>128,725,378</b>
<b>Non-current Liabilities</b>			
Debt	74,196,971	69,083,600	63,378,515
Other Long-term Liabilities	-	-	-
<b>Total long-term Liabilities</b>	<b>74,196,971</b>	<b>69,083,600</b>	<b>63,378,515</b>
<b>Current Liabilities</b>			
Trade Payables	793,107	701,223	702,449
Other payables	-	-	-
<b>Total Current Liabilities</b>	<b>793,107</b>	<b>701,223</b>	<b>702,449</b>
	-	-	-
<b>Equity</b>			
Share Capital	-	-	-
Retained Earnings	16,110,027	38,779,163	64,644,414
<b>Total Equity</b>	<b>16,110,027</b>	<b>38,779,163</b>	<b>64,644,414</b>
<b>Total Equity &amp; Liability</b>	<b>91,100,105</b>	<b>108,563,985</b>	<b>128,725,378</b>

Table 8 Projected Cashflow Statement for Model 1000 Cow Farm

Cashflow Statement	Year 1	Year 2	Year 3
Net Profit	16,110,027	22,669,136	25,865,251
Add Depreciation	1,666,667	1,666,667	1,666,667
<b>Working capital Changes</b>			
Changes in inventory	(793,107)	91,884	(1,226)
Changes in receivables	(368,282)	(19,159)	(19,159)
Changes in payables	793,107	(91,884)	1,226
<b>Cashflow after working capital changes</b>	<b>17,408,411</b>	<b>24,316,644</b>	<b>27,512,759</b>
Changes in other assets	-	-	-
Changes in other liabilities	-	-	-
<b>Operating cashflows</b>	<b>17,408,411</b>	<b>24,316,644</b>	<b>27,512,759</b>
<b>Investing Cashflow</b>			
CAPEX	(30,000,000)	(0)	(0)
<b>Cashflow from investing cashflows</b>	<b>(30,000,000)</b>	<b>(0)</b>	<b>(0)</b>
<b>Financing activities</b>			
Equity injection	-	-	-
Dividend	-	-	-
Debt	74,196,971	(5,113,372)	(5,705,085)
<b>Cashflow from financing activities</b>	<b>74,196,971</b>	<b>(5,113,372)</b>	<b>(5,705,085)</b>
<b>Cashflow changes</b>	<b>0</b>		
Opening cashflow	-	61,605,382	80,808,654
<b>Closing cashflow</b>	<b>61,605,382</b>	<b>80,808,654</b>	<b>102,616,328</b>

Figure 4 Key Ratios for model 1000 Cow Farm: Year 1-3



## 4.3 Critical Factors Behind Previous Projects.

Appendix 3 contains the questions used to structure the interview. These cover the key business areas: the investment context, Existing Commercial Agriculture, General Infrastructure, Source of Capital, Land, Pasture and Feeding, Cow Genotype, Governance, and Management / Personnel. Appendix 2 outlines a thematic map that indicates the key themes that emerged from the interviews. The dashed lines represent links between sub-themes.

### 4.3.1 The Context Behind the Foreign Direct Investment

#### Capital Gain and the Search for Returns

In the decade from 2005 through 2015, significant investments were made overseas by New Zealand dairy farmers; at the same time, several corporate dairy farming companies were started in New Zealand. The interviews all stated that New Zealanders' overseas foreign direct investment was driven primarily by significant capital gains on land and a search for cheaper land that would allow a better return. This created significant wealth on balance sheets while reducing returns on capital available in New Zealand.

Figure 5 The FDI was Driven by Capital Gain in New Zealand and a Search for Returns



The allocation of this capital to countries with lower land costs was seen as a good diversification (see quotation below; further quotes in Appendix 4):

*“the main reason at the time was that land prices in New Zealand were getting very high, and the actual cash flow and net income that you were generating off a dairy farm in New Zealand was buggar all...your biggest cash return was when you sold up and had the capital gain.”*

## The Pioneering Spirit

There was some suggestion that another driver was the sense of adventure, the pioneering spirit that struck a chord with what earlier generations had done in New Zealand by emigrating to New Zealand and developing the world-class dairy industry (see quotation below; further quotes in Appendix 4):

*“You know, if it's 90% financial, there's an element of adventure in it.”*

## Strategic Investment

Especially among projects funded by corporate investors, there was a focus on macroeconomics and higher-level strategic thinking around demand growth, supply growth, and geographic diversification. A major motivator was the trend after the global financial crisis to invest in hard/real assets rather than paper-based investments. Finally, one corporate was touted as a ‘water’ play; you were essentially investing in the water industry by investing in milk production, which is ninety percent water. The key result was the understanding that corporate, pasture-based dairy farming is an accepted alternative asset class. (see quotation below; further quotes in Appendix 4):

*“I'm not sure on their angles now but they really were pushing for real assets. Post-GFC right everyone got smoked on the you know stuff that wasn't real. So they were pushing for real assets. And then the second sort of reason for investment was they're very strongly focused on ESG. So they wanted to see you know us basically improving the environment”*

## 4.3.2 Existing Commercial Agriculture

### Existing Farming Type

The existing agricultural environment was considered a significant factor: Was milk production already well-established? Were required supplies available for dairy farmers' development, infrastructure, and operation? What was the availability of plant and equipment and qualified and experienced tradesmen/professionals for servicing equipment and vets / veterinary health supplies? Most of the investments were farm conversions from cropping to dairy. However, all were in countries and regions with dairy farming in existence; the focus was on the domestic market with little emphasis on exporting. The key finding is that the existing land use has no bearing on conversion to pasture dairy. (see quotation below; further quotes in Appendix 4):

*“All the farms that we bought were soya farms, literally just big paddocks of soya. And then, of course, we bought those blocks and then put all the infrastructure on, water and cow sheds and buildings and houses.”*

## Ancillary Service Availability

The usual services in every town in New Zealand were still available, but the locations were not so convenient, and the choice was limited. This impacted the speed of service, level of service, and quality of work. Some of the professional services were well behind modern standards. Pasture-based dairy is simple compared to a feedlot/TMR system. A lower level of technical support can be managed. (see quotation below; further quotes in Appendix 4):

*“there's not the access to people to service stuff. You've got longer wait times, you've got people who don't respond, because you haven't got the competition to do it in a range of things. And that's noticeable.”*

## 4.3.3 Infrastructure

### Roads, Power and Water

The general country infrastructure was also seen as an important criterion: What were the roads like? What was the availability of electric power? Was water readily available both indirectly for irrigation and directly for animal consumption, in the farm dairy and for potable use? The key knowledge gained from this area of questioning was the requirement for basic modern services. (see quotation below; further quotes in Appendix 4):

*“You need water. You need power. No matter how cheap the land is or how good it is.”*

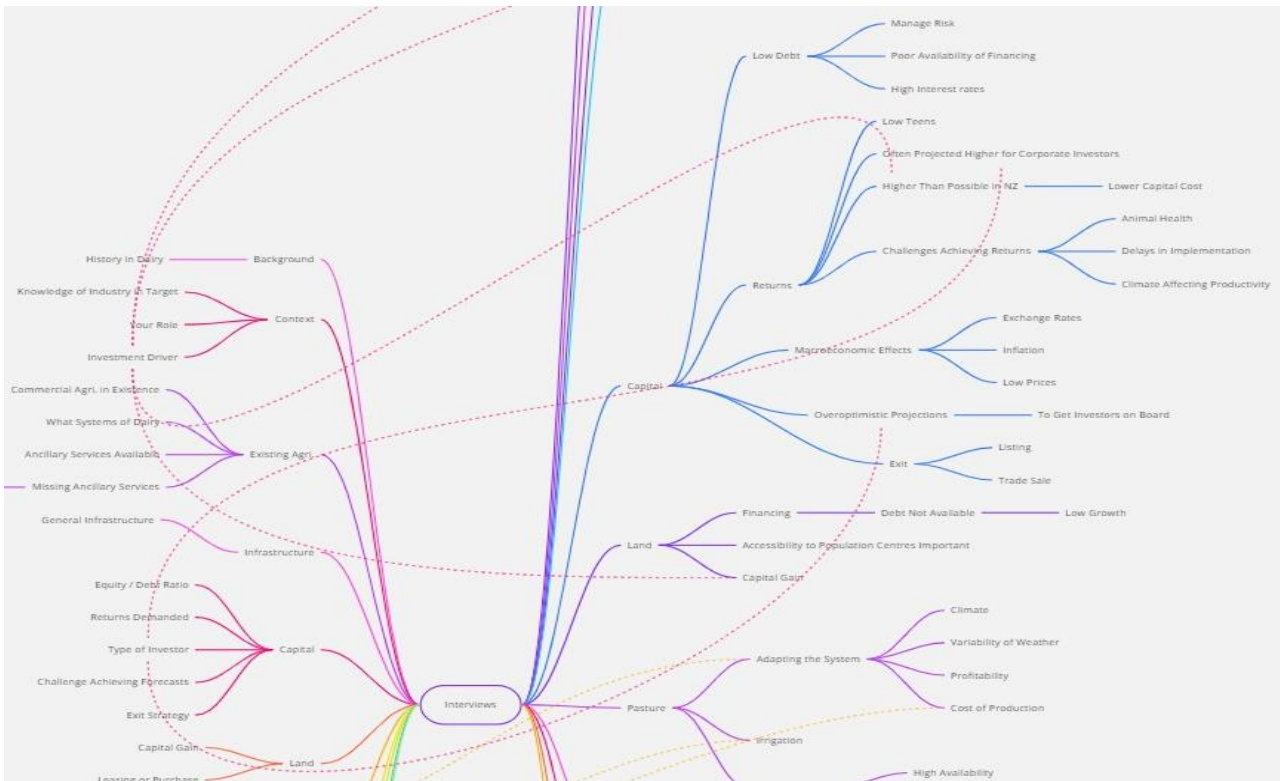
### Labour Availability

Usually, the population in the countries seeing investment was very urban-focused. In a significant part of the developing world, there is an exodus of the rural population to urban areas, and attracting labour can require creating an attractive living environment for families. (see quotation below; further quotes in Appendix 4):

*“build better housing and a bit of a social community around it, we built some housing. Arguably to have a stabilized in that community of population, we may have had to build our own small town, and a range of things”*

### 4.3.4 Capital

Figure 6 The Type of Investor is Important in Terms of the Return Expected and Time Frame



#### Debt to Equity Ratio

In the unsupported and very commercially focused New Zealand Farming environment capital allocation and return warrants much higher consideration than in other countries. What was the gearing ratio? What returns were expected? Who was investing? What were the problems in achieving the forecast return? And what was the exit strategy?

In general, the projects had no or very conservative debt loadings. The maximum debt loading was around 30%, and the projects with debt all tended to start with complete equity funding and take on debt later when established and in a more stable position. In some countries, long-term debt was not available, only seasonal 'crop' loans (see quotation below; further quotes in Appendix 4):

*“Well, when, when anything's a high risk, you know, you don't, you don't want to go and get bank debt because you'll end up with no assets and debt”*

#### Returns Expected

The return forecast varied depending on the investor; farming investors were happy with a much lower projected return with suggestions of around 12-13%, while corporate investors were pushing for a 15% plus return on capital. One investment was funded by pension funds, which were happy with lower returns and had a much longer time frame than corporate money (see quotation below,

further quotes in Appendix 4):

*“They were willing to look at much lower returns than an investment house or a genuine corporate investor was. That’s for sure. That’s farmers investing may well be one intuitively more realistic about the returns that farming can give. Because I can argue the other one, which when we ask is, you have very often those returns need to be up around that 15% level.”*

#### The Challenge of Achieving the Forecasts

Achieving the forecast returns was challenging, at least initially. Not enough consideration had been made for the less ideal climate and the length of time to get up and running. Capital expenditure had been underestimated. The less benign health climate than New Zealand also caused problems, with Foot and Mouth, Brucellosis and even mortality from snake bites (see quotation below; further quotes in Appendix 4):

*“New Zealand has a very benevolent climate and no requirement for supplements. And we found out in many of these climates, we had a lot to learn.”*

#### Macroeconomic Disruptions

The macroeconomic environment also had an effect, with inflation issues and widely fluctuating exchange rates. A few early bad years of milk prices also had a knock-on effect on forecast returns. Involving corporate and pension funds as investors brought an extra layer of management and reporting around Environmental, Social, and Governance, which had the effect of directly reducing productivity while adding extra costs (see quotation below; further quotes in Appendix 4):

*“So I guess a few things is the macro environment and how that played out. So, you know, we had some very tough years back in the day, low milk prices, those early years are really important to jack up returns. If you get a couple of shit years to start with, then you’re kind of chasing your tail the whole way. The second part would be, I guess they have an ESG focus, these investors, but my personal view is, I think there was a bit of a narrative around sustainable returns and how we can do this and we’re not going to impact our farming, the way we farm, etc. But the reality is you do, and you do by making decisions based on the ESG requirements of these funds, you do sacrifice returns as a result of that. And then I’ll say the third challenge was probably converting. So I know you mentioned that before. It does take quite a while to get that pasture growing”*



## The Issue of Realistic Business Planning

One big issue with achieving the returns was wildly overoptimistic projections to begin with that were never realistic. Corporate investors demand higher returns than is often achievable, but promoters are always willing to produce projections that investors want to see. Sunk cost fallacy can kick in, and more capital is allocated to solve the problem or scale out of the problem (see quotation below; further quotes in Appendix 4):

*“It was one of the big risks with the models were just nonsense spreadsheets. Yeah. With spreadsheet jockeys who had agricultural experience, but didn't understand particularly.”*

## Exit Strategy

The exit strategy was not that well considered by farming investors, who have a much longer time frame in investment. Corporate money tended to consider public listing or trade sales as a way of realising their gains. So far that has been a challenge with shares trading at a discount to net asset value. The farming investors depended on other farming investors to purchase their shares. They tended to want only to reduce their stake rather than make a complete sale (see quotation below; further quotes in Appendix 4):

*“we're just in the starting process of a major liquidity event where something like 50% of the shareholding will be sold. Won't be 50% of the shareholders leaving because a lot of shareholders will take 20%, 30%, 40%, 50% of their holding off the table”*

## 4.3.5 Land

Figure 7 Capital Gain on Land was a Strong Driver Behind the Investment



## Investment Driven by Capital Gain

Going back to first principles pasture-based dairy farming relies on converting the sun's energy into nutritious food, and to do so requires large areas of land. Capital gain was considered a major

factor by the farming investors with significant experience in New Zealand. Corporate investors had a much greater interest in cash returns and focused more on the cyclical nature of capital gain. Of interest is the fact that most of the investments had a significant capital gain on land; they invested in lagging countries, which were behind the large increases in land value in the 'developed' world (see quotation below; further quotes in Appendix 4):

*“we've been through some periods of capital appreciation of significant appreciation, which probably means the next the betting person on history was our next 10 or 20 years, there'll be capital depreciation or no, no appreciation, you know, it's completely inconsistent and unplanned. It tends to happen in cycles, we got a lot of gain and then nothing and then talking land investment. So it's not that it's not a factor to talk about”*

#### Leasing can be Cost Effective

Leasing land was also happening especially run-offs. Leasing land to farm was now gaining more consideration as capital gain had reduced the return on capital on purchased land (see quotation below; further quotes in Appendix 4):

*“and then over time might have expanded further was leasing, you know, can be factored into potentially improving a return on invested capital and a range of things”*

### 4.3.6 Pasture

Figure 8 Achieving Returns is Based on Growing Large Amounts of Pasture and Achieving a High Portion in the Cow's Diet



#### New Zealand Unique Advantage

Operators quickly learned how lucky New Zealand was with reliable rain-fed grass growth in a

temperate climate or relatively cheap irrigation with amazing yields. Grass growth was more difficult to manage, and it was invariably lower. Grass utilisation by cows was also more difficult to manage. In countries with a climate similar to New Zealand's, irrigation could not be justified, but it would have been desirable for ease of management in a less predictable climate. Continental climates with distinct wet and dry seasons were a new experience (see quotation below; further quotes in Appendix 4):

*“Was there issues around adapting the Kiwi system and the grassland system to? Yeah, it's harder. It's been harder too far at high levels of execution. The change from an agronomical point of view that might happen in seven days in New Zealand, Chile or Ireland or England can happen in two days. So that means that your management needs to be better rather than not quite as good.”*

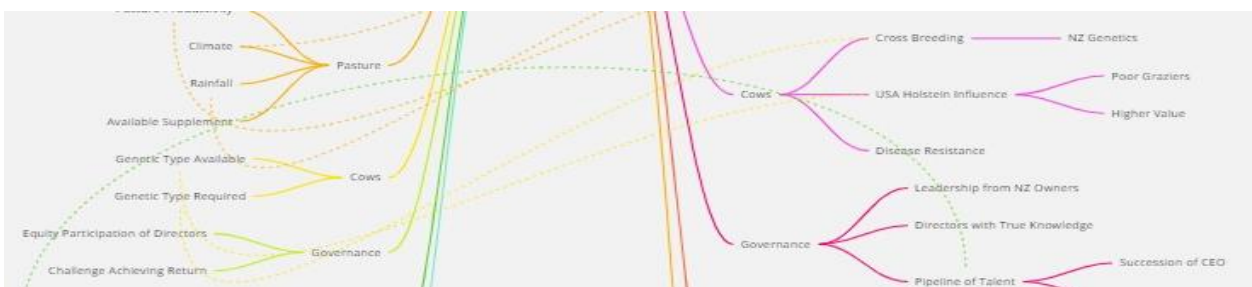
#### Affordable Supplement Feedstuffs

Much greater levels of supplements were used; however, there were greater options for affordably sourcing these in regions with significant cropping areas. Supplementation was often about feeding a more balanced diet with less nutritious subtropical grass growth and replacing dry matter (see quotation below; further quotes in Appendix 4):

*“We use amounts of maize, silage. We feed soya. We feed cottonseed. We feed citrus pulp. Brewer's grain, you name it, we feed it”*

### 4.3.7 Cows

Figure 9 The Cow Genotype is Crucial to Pasture-Based Farming



#### North American Genetics Predominate

The right type of cow is key for operating a pasture-based system. Total mixed ration style genetics now predominate worldwide, both North American and European Holsteins. Sourcing cows that could function productively on pasture systems was a problem, while the more tropical climates could create health problems with purebred Bos Taurus animals. Importing New Zealand genetics and cross-breeding were the chosen solutions (see quotation below; further quotes in Appendix 4):

*“What we were doing, I mean, it was all feedlot Holstein genetics. And bloody things won't walk and won't get in calf. Yeah. And, like, I've had a real lifetime interest in genetics and understand it well and bred a lot of bulls by big companies. So we've – the perfect cow for us there is a J12 F4”*

#### Changing to NZ Genetics Harms the Balance Sheet

One issue identified with the corporate operation was the short-term effect on the balance sheet of changing cow genotype. The value of cows can take a significant hit when they move from an American Holstein to a New Zealand cross (see quotation below; further quotes in Appendix 4):

*“And if we crossbreed, they're going to seriously erode their capital value. And we had a lot of it, we ended up with 80,000 of these animals. And you multiply them and take, you know, crossbreed them and potentially 400 or 500 a head off, it's a large sum of money, you don't want to write off your balance sheet.”*

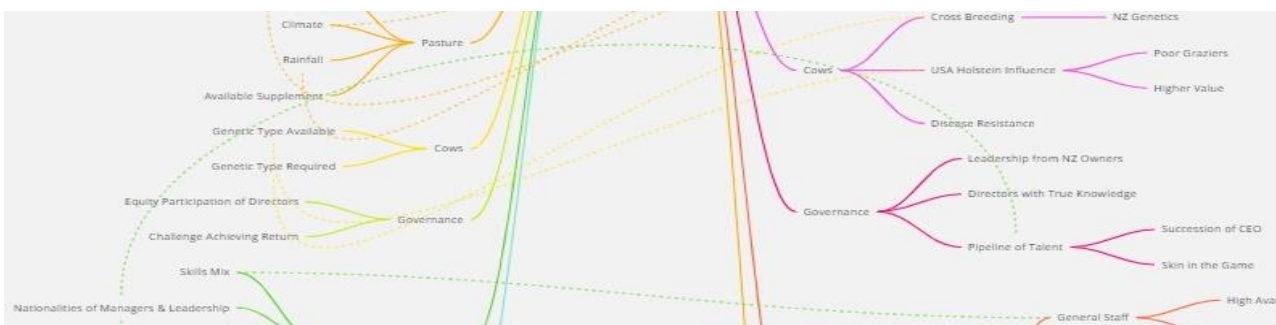
#### The Correct Cow for the System is Key

Consideration must be given to fit the type of cow to the environment and the feeding system being utilized. A more robust cow may be necessary, or one more suitable for higher levels of supplements and starch-based supplements (see quotation below; further quotes in Appendix 4):

*“so it's absolutely critical, that you design your production system, and then you must fit the cow to it”*

### 4.3.8 Governance

Figure 10 Senior Leadership Need to Have Skin in the Game and Understand the Business



#### Local Management and Leadership from Investors are both Key

Governance and the board of directors had a major effect on the project's performance. Local management and senior leadership were key to the success in the country and that transferred to the board level. However, in the early stages, significant support was required by the New Zealand shareholders (see quotation below; further quotes in Appendix 4):

*“we had a production committee, we have one that's somebody there, sometimes they go in twos, but we would have at least six times a year, plus all the board are there late this month and then two or three of us go back in September as well”*

#### True Understanding of Dairy Farming is Required at the Director Level

A requirement for technical knowledge and a true understanding of the business was seen as crucial. The corporate-financed projects suffered from a lack of profound understanding of pasture-based investment at the board level (see quotation below; further quotes in Appendix 4):

*“so you want some directors who understand, if you're a pasture-based dairy business, understand really well, obviously, business financial stuff, the key, you actually want people who bring knowledge about the business to the as directors, and whatever they bring, they want to be interested enough that where they don't fully understand the business, they demand preferably, and certainly you welcome and push and encourage them to get to spend enough time around people in the business as to actually understand it, because then when they consider the board level, and be of genuine benefit, and of course, when things are tough, and every business has those periods, they have input to help you if you're in the MD chair to succeed if they don't understand the business, they're going to throw rocks at you, and it's not going to be fun”*

#### An Interruption at the CEO Level Causes Harm

Several instances of inexperienced CEOs or simply a change in CEO that was not smooth seriously impacted performance (see quotation below; further quotes in Appendix 4):

*“Each of them have done a good job, but each of them, it took them two years before they were any bloody good. Got it, got it. And for the first time, we've got a CEO now that's bought into the concept that his successor needs to come from within.”*

#### The Senior Leadership Need Alignment with Investors

Skin in the game often resulted in better performance and was required to ensure an alignment in focus between executive directors and shareholders.

*“what's proven to be the systems and corporate, the corporate world, at the very top of the business, they may get access to a share pool in the business.”*

#### A Positive High Achieving Culture

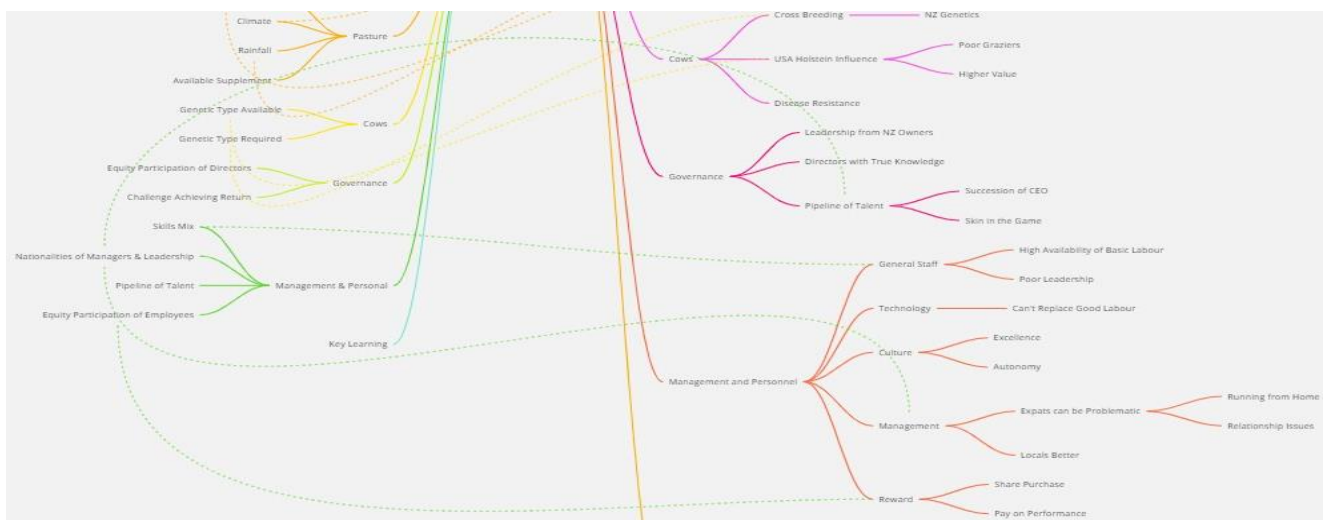
A CEO who focuses on a culture of excellence is key. A drop in expectation and performance down through the layers of management can have a serious effect at the farm level. A different

type of person is required for farm purchase and development than daily operation. Alignment between shareholders and senior management is a must to create shareholder value. The understanding that food production is counter-cyclic to commercial property or the wider economy is important; primary commodities are a good hedge against the wider economy (see quotation below; further quotes in Appendix 4):

*“The CEO, who's very capable and has been in the business before he becomes the CEO, is demanding excellence. And so we have got 85th percentile performance”*

### 4.3.9 Management and Personnel

Figure 11 Human Resources for Success



#### People Management is a Rare Skill

Finding people with leadership and management abilities was difficult. Good farmers and cow and pasture managers often have no experience leading teams of people. However, finding people to do the milking and farm work was generally not a problem (see quotation below; further quotes in Appendix 4):

*“most operators, the smallest medium-sized businesses have no training in employing people. So they tend to be poor at it, not because they're bad, bad people or don't, it's just that they study bloody pasture and cows”*

#### Technology is Not a Nirvana

Technology was often seen as more of a hindrance to good outcomes than an aid.

*“So technology, so you can’t use money to also purchase technology to help. And in fact, I’ll argue that most often, it just encourages that manager to sit inside and look at a bloody screen, as opposed to get out and do stuff.”*

#### A Different Work Ethic Exists

Labour productivity could be a problem, especially for general farm workers.

*“The standard is 10 people doing a one-person job. And your labour costs are still a quarter of what it is in New Zealand.”*

#### Leadership vs Management

A knowledge of how to lead people, create a culture of excellence and manage for profit is key (see quotation below; further quotes in Appendix 4):

*“I want to profit, I don’t want a production manager. Most managers on dairy farms and most other businesses are production managers. I had at least 50 managers who had control of P&Ls. Yeah, every single one loved it, which I’ve never seen in a cultural business before because all of it was designed in a way that every month allowed them to see how they were going and to make decisions about how to hit targets, which gave them pride and would get into their bonus and whatever else.”*

#### Managers from New Zealand are the Solution?

Interestingly, having New Zealanders in management positions wasn’t seen as a requirement, and it often turned into a problem. A core of managers who had grown up in pasture dairying would seem to have been crucial, but the opposite was true (see quotation below; further quotes in Appendix 4):

*“The best New Zealand guys didn’t need to leave New Zealand. And the guys who were prepared to go tended to be people running from something.”*

#### Skin in the Game Can Help Alignment

Equity participation at the farm management level was seen as key by some of the projects; this was found to be attractive to ambitious managers. However, others thought the ownership slice was so small that it had no motivating effect. Another used a different method and created the contract milking system, allowing a certain level of autonomy for farm managers and higher rewards while at the same time reducing human resource risk for the project. An interesting comment made by one project was that the key was a direct link between the value delivered and their income (see quotation below; further quotes in Appendix 4):

*“That’s critical as well. They’ve got to have some blood in the game, as we call it.”*

### Motivating People is Key

Good management was identified as a key requirement, and it did not necessarily have to come from within dairy farming. It simply had to be motivated, energetic and focused (see quotation below; further quotes in Appendix 4):

*“because we just don’t have anybody, bringing somebody in from outside dairy is a better option than bringing in somebody from dairy, because somebody from dairy has preconceptions that you’ll never change”*

### Corporate Investors

An interesting point was that corporate money is not suited to pasture-based dairy farming. The required return is not achievable, and the time frame is too long.

*“corporate investment is extremely ill-suited to pasture-based agriculture”*

## 4.3.10 Key Learnings

### Achievable Business Plans

The first key requirement is a realistic business plan based on achievable assumptions and a sensible time frame. The plan must account for the vagaries of pasture farming, weather, disease, nature, and fluctuating prices (see quotation below; further quotes in Appendix 4):

*“businesses with a sound project plan, a sound, well-designed models that actually forecast a potential return that is practical and sound”*

Figure 12 The Key Learnings for Success



### The Right People

The second key area is human capital, including directors, management, and staff. It involves people with the right skills, attitudes, and energy, along with the ability to understand the areas to focus on for profitability. Of course, large-scale projects require leadership skills, not just technical livestock and pasture management skills.



*“big point, in a sense, is all around how critical it is to have the people, including the skilled individual enterprise managers, focused on the right thing built into it”*

#### Be Humble

Hubris around New Zealand dairy farming was a major factor. Not enough account was taken of the fact that New Zealand is uniquely blessed with low-cost dairy food production. There was also a lack of understanding about how much more difficult continental and subtropical climates would be to operate in. The wrong land was purchased due to a lack of understanding about rainfall and grass growth (see quotation below; further quotes in Appendix 4):

*“the biggest weakness was the New Zealand character, in a sense, and actually believing they already knew everything there was to know about dairying. And they found out in many of these climates, they had a lot to learn”*

#### Thorough Due Diligence

Due diligence that was either not done at all or done in a very haphazard way, sunny day syndrome – everything looks good when the sun is shining, and there has been good rainfall (see quotation below; further quotes in Appendix 4):

*“I’m understating to say that due diligence on agriculture was done in 24 hours and 90% of the due diligence was around country risk.”*

Africa is the only continent with a fast-growing, youthful population. At the same time, significant economic growth is taking place, and the middle class is growing. A growing middle class consumes more meat and dairy. In Zimbabwe, the milk deficit is the greatest of any country in East Africa. It is unique in having large areas of unutilised commercial farmland. This, combined with the most temperate climate in the region, creates the opportunity to become a regional dairy producer and exporter. The financial projections based on local and South African data show attractive returns, and relatively low production costs should be possible.

Building a successful corporate pasture dairy farming business creates an opportunity for investment as an alternative asset class of institutional capital. Pension and insurance funds can protect and grow capital with relatively low risk and medium returns. Realistic business plans must be developed, and careful due diligence needs to be completed. Zimbabwe does not have the ideal temperate climate, but by adapting New Zealand principles, production with a comparative advantage should be possible. The other key factors are the right leadership and management; lower-skilled roles would appear to be easily filled.

## 5 Findings and Discussion

### 5.1 Investigate the dairy food market in Zimbabwe.

In the late 1990s, Zimbabwe's dairy industry became a major regional exporter and even shipped award-winning cheese to Europe. The land reform process decimated the industry, causing a collapse in the number of dairy farms, leaving the country now a major *importer* of dairy foods. Self-sufficiency in dairy foods varies across the continent from 100% in South Africa to nearly zero in West African countries. East African countries are spread between the two extremes. SSA's population is forecast to double by 2050. Economic growth has risen to be in the medium-to-high single figures since 2000, resulting in a growing middle class with Western diets. The amount of food produced must rise, and rising incomes will cause an increase in demand for dairy foods.

All the milk processors visited in Zimbabwe imported skimmed milk powder and used it fortified with vegetable oil to produce low-quality dairy products. They all stated that this amounted to around 50% of their output. This reconstituted product was seen as inferior in the Zimbabwean market but was the only way to meet the market demand. Importing milk powder involved both logistical problems and financial strain, requiring large amounts of foreign exchange. There is no doubt that the dairy market is currently in deficit, and the milk price is significantly higher than world prices. However, the country is still in difficult political and economic circumstances, and the risk of investment in the industry is certainly higher than that of other more stable countries on the continent. All of Zimbabwe's milk processors were visited to nullify the limitation of not having enough interviewees.

### 5.2 Produce three years of financial models.

The assumptions used in preparing the financial models were based on known data from South Africa, which is the most applicable comparable to Zimbabwe. These numbers were adjusted for known differences in Zimbabwe, and a certain level of caution was used on income and costs. Return on assets is projected to be 17% in year one, rising to just over 20% in year three.

### 5.3 Explore the critical factors behind previous projects.

The first key success factor for establishing large-scale pasture farming in any country is correct due diligence on the chosen land and the ability to implement an appropriate pasture farming system. The optimum soil type and fertility, rainfall pattern, temperature, and humidity levels are all crucial to the viability of pasture-based production. The ability to adapt the New Zealand system to

the chosen region is key, New Zealand has a unique climatic advantage. Other countries have a similar temperate climate, but some adaptations need to happen to account for reduced or more seasonal grass growth, this can be in the form of irrigation or supplements. Understanding the relationship between the cost of grazed grass, conserved forage and concentrate is important to achieving the lowest total feed cost. This concurs with Wilson and Rowath (2013).

The second key success factor is producing realistic technical and financial plans with achievable proximate objectives; Wilson and Rowath (2013) outlined this as a basic requirement. It tends to be most badly abused when trying to 'juice' the returns to gain corporate investment. However, the investors interviewed also admitted to having made mistakes, usually through overconfidence around the timeframe of returns and the ability to achieve good performance too promptly.

Wilson and Rowath (2013) found ancillary services to be a significant factor; however, this was not identified in this research. Basic infrastructure in the form of roads, water, and electricity was identified as a prerequisite. The trade and professional services around plant, equipment, and veterinary support were seen as somewhat lacking but not as critical factors to success.

Finally, the human resource. Wilson and Rowath (2013) suggested this was important from the director level to the general farm worker level. This research did not fully confirm this; although staff could be very low-skilled and very low productivity, sourcing farm worker-level employees to carry out the labour was never seen as a problem. Recruitment of management personnel with the ability to lead staff and a good understanding of the critical success factors in a pasture-based dairy farm was a problem that needed development. Furthermore, director-level governance requires people to understand pasture-based dairy farming and the strategic objectives required to produce acceptable financial returns. Communicating these downwards and motivating and controlling the farm management was required.

Interviewees suggested that projects that failed or produced uneconomic returns were doomed to fail from the pre-planning stage. Poor due diligence around the physical environment, soils, and climate resulted in inappropriate developments. These developments were then hampered by over-optimistic physical and financial projects, partly due to a lack of knowledge and partly due to a need to raise investment.

Many of those interviewed stated that hubris abounded, even among very good operators, and a lack of exposure and experience in pasture farming outside of New Zealand caused some delay in achieving forecast projections. The strong ability of the operators allowed them to learn, adapt and get projects back on track. An interesting point was that all the projects in North and South America

had ridden another round of capital gain on their land, which lagged behind New Zealand; this greatly improved the overall return.

A lack of strong and knowledgeable governance from the director level and the ability to cascade a culture of excellence down to the farm management level was a major factor in project failure at the operational stage. Most investors interviewed repeated this point.

## 6 Conclusion

Zimbabwe is a niche investment destination, even within Africa. The past political and legal problems have created a challenging environment, but they are also great opportunities. They have the greatest supply /demand imbalance for milk in East and Southern Africa. The country uniquely has large areas of commercial-scale farmland that are not in production, whilst water resources are available for irrigation. The climate, although pushing to extremes for pasture-based dairy farming, is the best in the region, which, because of its latitude, is plagued with high temperatures and high humidity.

The financial projections are conservative and show a viable business capable of producing attractive returns. By sourcing the correct type of capital, it is possible to win for all stakeholders: the investor, the operating partners, management and personnel, local communities, and the government.

Making the project spreadsheet successful and achieving it on the ground will require creating a pipeline of leaders. They will need a clear understanding of the strategy, critical success factors, and the ability to lead people and achieve budgeted physical and financial performance. The spreadsheet projections need to be realistic and based on the operating environment.

## 7 Recommendations

- 1) **Develop the Proposal** - The author should develop the proposal further. The country is in deficit for raw milk, and the milk price follows the world market in addition to the high logistics cost of importation. The financial projections show comfortable net profit margins and return on capital. The higher margin pasture system gives some protection from risk. It allows the opportunity to develop a cost leadership strategy and a sustainable competitive advantage.
- 2) **Identify the Region** - The author must identify the region of Zimbabwe in which to operate as a prerequisite. Higher-altitude areas are important to reduce the effects of the subtropical climate. Land with heavier fertile soils must be selected within these areas to ensure efficient irrigation and maximise grass production.
- 3) **Develop Conservative Projections** - The promoter should project conservative budgets regarding cost and income, allowing for delays and less-than-optimum performance in the initial phase.
- 4) **Find Appropriate Capital** - The promoter must find capital that fits the returns profile. Returns from pasture dairy farming are not excessive, and the timeframes required to reach maturity are long.
- 5) **Assemble the Right Team** - A knowledgeable team must be assembled. This should consist of directors and skilled management who can lead at the farm level. Management needs to be focused on the critical success factors that achieve profit, and their reward needs to be linked to performance they need to have significant skin in the game.

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## Appendix 1 Interviews for Five Forces and Pestel

Akinyi, W. (2021). Interviewed by Rob Shaw, November 2021, Kenya.

Wanjiru Akinyi works in agricultural recruitment in Kenya.

Angier, P. (2022). Interviewed by Rob Shaw. May 2022, UK.

Patrick Angier worked in finance and spent a period in Zambia and Zimbabwe.

Archibald, D. (2022). Interviewed by Rob Shaw. January 2022, Zimbabwe.

Daryl Archibald runs Dendairy milk processing in Zimbabwe.

Atchison, S. (2021). Interviewed by Rob Shaw, November 2021, Ethiopia.

Susan Atchison is involved in the hospitality industry and poultry farming in Ethiopia.

Becca, D. (2022). Interviewed by Rob Shaw, November 2022, South Africa.

David owns an international dairy consultancy business focused on the economics of milk production.

Benton, G. (2021). Interviewed by Rob Shaw, November 2021, Kenya.

Graham Benton has run several Agri-tech companies in Nairobi, Kenya.

Bernardi, J. (2021). Interviewed by Rob Shaw, November 2021, Ethiopia.

Justin Bernardi is the Operations Director of Ethiochicken, Ethiopia's leading poultry business.

Boenders, O. (2021). Interviewed by Rob Shaw, November 2021, Uganda.

Olav Boenders is the Operations Director of a sizeable horticultural business in Uganda.

Bruce, D. (2021). Interviewed by Rob Shaw. November 2021, Zimbabwe.

Doug Bruce has a leading farm animal veterinary practice in Zimbabwe.

Conradie, L. (2022). Interviewed by Rob Shaw. January 2022, Zimbabwe.

Lance Conradie works in farm development in Zimbabwe.

Conforzi, G. (2021). Interviewed by Rob Shaw, November 2021, Uganda.

Giovani Conforzi is the Operations Director at Biyinzika Poultry in Uganda.

Cordingly, J. (2021). Interviewed by Rob Shaw, November 2021, Kenya.

Jeremy Cordingly owns the largest agricultural laboratory in East Africa.

Deacon, N. (2021). Interviewed by Rob Shaw, November 2021, Uganda.  
Niall Deacon is a director of a large flower business in Uganda.

Dembleton, R. (2022). Interviewed by Rob Shaw. January 2022, Zimbabwe.  
Rob Dembleton is an agricultural engineer in Zimbabwe.

Ellis, D. (2021). Interviewed by Rob Shaw, November 2021, Ethiopia  
David Ellis is the Managing Director of Ethiochicken.

Fisher, R. (2022). Interviewed by Rob Shaw. January 2022, Zimbabwe.  
Rob Fisher is an agricultural consultant and farmer in Zimbabwe.

Follwell, C. (2022). Interviewed by Rob Shaw. January 2022, Zimbabwe.  
Craig Follwell runs the milk collection system in Zimbabwe.

Foxton, J. (2021). Interviewed by Rob Shaw, November 2021, Kenya.  
Jim Foxton is an agricultural consultant and farmer in Kenya.

Grobber, D. (2021). Interviewed by Rob Shaw, November 2021, Ethiopia.  
Dowe Grobber is involved in the Ethiopian beef industry.

Hall, A. (2021). Interviewed by Rob Shaw, November 2021, UK.  
Andrew Hall is a farm agent in Zambia.

Halliday, J. (2021). Interviewed by Rob Shaw. November 2022, South Africa.  
Jane Halliday is an agricultural consultant covering southern Africa.

Hari, S. (2021). Interviewed by Rob Shaw, November 2021, Uganda.  
Sri Hari runs a dairy processing business in Uganda.

Hawgood, C. (2022). Interviewed by Rob Shaw. January 2022, Zimbabwe.  
Christopher Hawgood is a dairy farmer and director of Dariboard in Zimbabwe.

Hewart, N. (2021). Interviewed by Rob Shaw. November 2021, South Africa.  
Noel Hewart is an agricultural engineer covering southern Africa.

Holliday, M. (2022). Interviewed by Rob Shaw. January 2022, Zambia.

Mark Holliday is a dairy farmer in South Africa and Zambia.

Hulbert, B. (2022). Interviewed by Rob Shaw. January 2022, Zimbabwe.

Bryan Hulbert is chief executive officer of a horticultural distribution business in Zimbabwe.

Johnston, J. (2021). Interviewed by Rob Shaw, November 2021, UK.

Jim Johnston is a director of Biyinzika Poultry in Uganda and a consultant across the continent.

Kirk, I. (2022). Interviewed by Rob Shaw. January 2022, Zimbabwe.

Ice Kirk is a dairy farmer and shareholder in a dairy processing company.

Lube, L. (2021). Interviewed by Rob Shaw. July 2021, Zambia.

Lizze Lube is an investment officer at an agricultural investment fund.

Macsporrán, P. (2021). Interviewed by Rob Shaw. July, Portugal.

Peter Mac Sporrán is a farmer and founder of AgDevCo.

Magney, J. (2021). Interviewed by Rob Shaw, November 2021, Uganda.

John Magney is a pig farmer in Uganda.

Mandiwanza, A. S. (2022). Interviewed by Rob Shaw. January 2022, Zimbabwe.

Anthony Mandiwanza is the Chief Executive Officer of Dariboard in Zimbabwe.

Middleton, J. (2021). Interviewed by Rob Shaw, November 2021, Uganda.

Jim Middleton is a farmer and machinery distributor in Uganda.

Mitchel, R. (2021). Interviewed by Rob Shaw. November 2021, Zimbabwe.

Renee Mitchell is a dairy farmer in Zimbabwe.

Mackenzie, S. (2022). Interviewed by Rob Shaw. January 2022, South Africa.

Stuart Mackenzie is a dairy farmer in South Africa.

McMullen, A. (2022). Interviewed by Rob Shaw. January 2022, Zimbabwe.

Anthony McMullen is a poultry farmer in Zimbabwe.

Mostert, J. (2022). Interviewed by Rob Shaw. January 2022, South Africa.

Jaco Mostert runs an agricultural distribution business in South Africa.

Mudd, P. (2021). Interviewed by Rob Shaw, November 2021, Uganda.  
Piers Mudd is the Chief Executive Officer of Yalello Fish Farming in Uganda.

O'Donoghue, R. (2022). Interviewed by Rob Shaw. January 2022, Zimbabwe.  
Ross is a shareholder of an irrigation distributor in Zimbabwe.

Oostindieen, O. E. (2022). Interviewed by Rob Shaw. January 2022, Zimbabwe.  
Evert Oostindieen is employed by Dariboard in Zimbabwe.

Peacock, C. (2021). Interviewed by Rob Shaw, November 2021, Kenya.  
Dr. Christine Peacock is a shareholder in Sidia animal health distribution in Kenya.

Pearson, C. (2021). Interviewed by Rob Shaw, November 2021, Ethiopia.  
Chris Pearson is the Chief Executive Officer of a logistics company in Ethiopia.

Philip, C. (2022). Interviewed by Rob Shaw. January 2022, Zimbabwe.  
Calum Philip is the managing director of Prodairy in Zimbabwe.

Pond, A. (2021). Interviewed by Rob Shaw, November 2021, UK.  
Andrew Pond is a business consultant with extensive experience in East Africa.

Rehmann, J. (2021). Interviewed by Rob Shaw, November 2021, Kenya.  
Joseph Rehmann is the founder of Victory Farms in Kenya.

Ritchie, A. (2021). Interviewed by Rob Shaw, November 2021, UK.  
Andrew Ritchie is an agricultural consultant with extensive experience in Africa.

Roberts, S. (2021). Interviewed by Rob Shaw. November 2021, Zimbabwe.  
Sandie Roberts manages a horticultural business in Zimbabwe.

Stubbs, R. (2021). Interviewed by Rob Shaw. November 2021, South Africa.  
Renee Stubbs is a large dairy farmer in South Africa.

Tozer, J. (2021). Interviewed by Rob Shaw, November 2021, Kenya.  
Jim Tozer is the Chief Executive of Kenchic in Kenya.

Turnbull, J. (2021). Interviewed by Rob Shaw, November 2021, Kenya.  
Jim Turnbull is an African agricultural consultant.

Tyrell, D. (2021). Interviewed by Rob Shaw, November 2021, Kenya.  
David Tyrell is an African agricultural consultant.

Walker, R. (2022). Interviewed by Rob Shaw. January 2022, South Africa.  
Rob Walker is a grassland specialist in South Africa.

Wallace, B. (2021). Interviewed by Rob Shaw, November 2021, Ethiopia.  
Brent Wallace is a dairy farmer in Ethiopia.

Warren, A. (2022). Interviewed by Rob Shaw. January 2022, Zambia.  
Andrew Warren is a farm agent in Zambia.

Watson, J. (2021). Interviewed by Rob Shaw, November 2021, Uganda.  
John Watson is a pig farmer in Uganda.

Webster, S. (2021). Interviewed by Rob Shaw. November 2021, Zimbabwe.  
Sean Webster is a dairy farmer in Zimbabwe.

Weller, P. (2022). Interviewed by Rob Shaw. January 2022, Zambia.  
Phil Weller is a flower farmer in Zimbabwe.

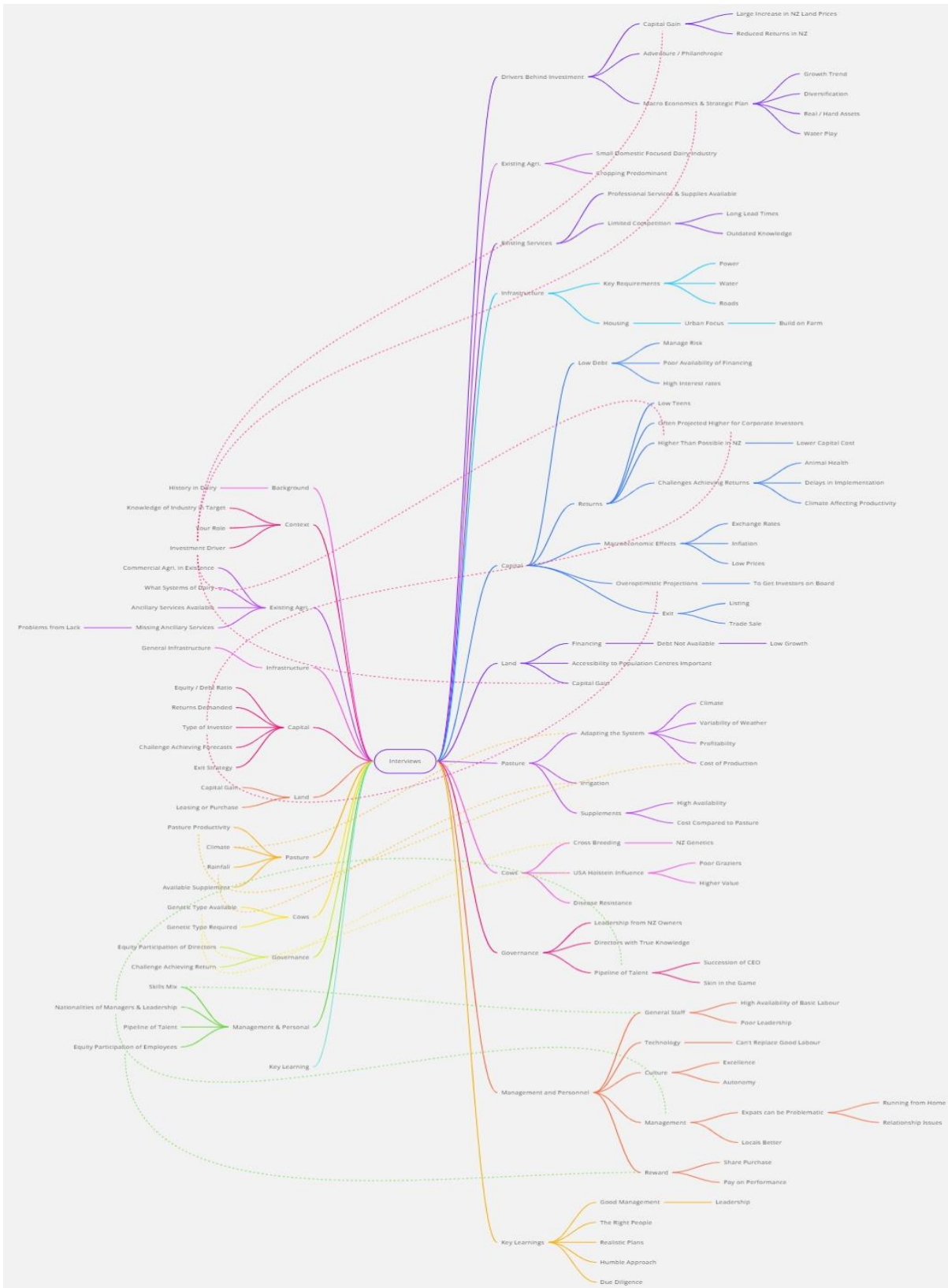
Zee, C. J. (2021). Interviewed by Rob Shaw, November 2021, Ethiopia.  
Cor Jan Zee is a farmer in Ethiopia.

Zuch, M. (2021). Interviewed by Rob Shaw. July 2021, UK.  
Martin Zuch is a banana farmer in Zambia.



# Appendix 2 Key Themes from Interviews

The dashed lines represent links between sub-themes.



## Appendix 3 Questions for Qualitative Interviews

### Background:

1. What is your history in dairy farming?

### Context:

2. What is your knowledge of the dairy industry in .....?
3. What was your involvement/ role in ..... project?
4. What was the main driver behind the investment?

### Existing Commercial Agriculture:

5. What existing commercial agriculture was there in .....?
6. What system of dairy production was used?
7. What ancillary services were available (e.g. veterinary, feed, plant, machinery)?
8. What ancillary services were missing?
9. What effect did a lack of these services have?

### Infrastructure:

10. What was the situation with roads, power, water, schools, and housing pre-investment?

### Capital:

11. What was the mix of equity and debt?
12. What returns were investors demanding on equity?
13. What type of investor did you have (private individuals, corporate investors, VC, PE)?
14. What were the challenges of achieving the forecast return?
15. What was the exit strategy?

### Land:

16. How was capital gain on land factored into the returns?
17. What consideration was given to leasing land over purchasing?

### Pasture:

18. How did pasture productivity affect the forecast income?
19. What was the rainfall and its distribution?
20. How did the natural rainfall pattern affect pasture production?
21. What effect did supplement availability have on feed budgeting?

### Cows:

22. How did the genetic type of cow available affect productivity?
23. What genetic type of cow is required?

### Governance:

24. How did the equity participation of the directors affect the enterprise's performance?
25. What were the challenges involved in getting a return from pasture dairy farming compared to other corporate investments?

Management and Personnel:

- 25 Describe the skills mix within the senior leadership team (technical, financial, and local)
- 26 What was the mix of nationalities on the board and senior leadership team?
- 27 How did you create a pipeline of local talent?
- 28 What opportunity was there for equity participation for employees (please give details)?
- 29 What was your key learning from the whole project?

## Appendix 4 Additional Quotations from Interviews

### Capital Gain and the Search for Returns

*“so you had enormous wealth being created, which people could then become, not through operating performance, but through capital gain. And as a result, they had the money.”*

*“and I know this is a challenge for farming investments, but all of them were based on return on invested capital”*

*“the target was absolute return on investment”*

*“This is all about cash returns. It's about operating profits rather than, you know, in New Zealand, obviously, there's been massive wealth generated through capital gain, and the same in the UK and Europe and America.”*

### The Pioneering Spirit

*“there was non-financial interest, there was the pioneering spirit, you know, the adventure, the, or the philanthropic”*

*“And there's certainly an element of not just a desire but a responsibility for the local people to be better off for us being there.”*

### Strategic Investment

*“You know, you could see that the biggest gap in the global food supply chain is, is the gap in fresh milk supply in tropical countries.”*

*“you want to create value, but I saw, in an industry that's evolving, if you're ahead of the game, as long as you're generating positive, impacts in your business, you know, somewhere down the track, you know, it's going to be a good place to be and there will be interest, from investors”*

*“that we needed to diversify, and that our diversification would not be industry diversification, but geographic diversification”*

*“investors love the idea if you've got not necessarily all the best reasons, but they love the idea of if you're securing water as well, often in their minds, and even on a piece of paper, they'll see that as being because of course, the planet's drying out”*

**WRT these quotes, please answer the so what question here. What are the implications of these statements? The same applies for the next few sections.**

## 8.1.1 Existing Commercial Agriculture

### Existing Farming Type

*“Most of the dairy production is internal consumption, so it's not an exporter of dairy products like New Zealand.”*

*“the dairy industry is about 10% of the size of the New Zealand industry”*

*“we probably get between 30% and 50% more for our milk than the local guys because they can't chill their milk”*

### Ancillary Service Availability

*“So a lot of services will have been available, veterinary, feed etc.”*

*“lead times are longer, you need a bit, you've got to be more patient. Don't expect things to happen as quickly.”*

*“vets in were trained 20 years ago, that was a huge problem. They didn't know modern stuff.”*

## 8.1.2 Infrastructure

### Roads, Power and Water

*“But the problem is it's 200 Ks down a dirt road. Yeah. And in the wet season, the only way to get in there is helicopters.”*

*“roads, so transport potentially, development, extensive development of power, a range of things were less. None of it was a major, in my view, a major factor or major impediment. And in fact, I'll have to think whether I'll consider it wasn't any of the countries I've been to. But because it's part of that flip side there may be a greater opportunity there for a higher level of return as well”*

### Labour Availability

*“We had to build, we had to build accommodation on the, on the farm for the, for the, uh, the staff and that, you know, that was an issue in itself”*

### 8.1.3 Capital

#### Debt to Equity Ratio

*“So they were 30% debt as a maximum”*

*“we knew that we had to front up with the cash to buy the property and for the fit-out, to build the cow sheds and to build all the feed pads. So we actually, I think it was quite smart in the end because we didn't have a lot of debt”*

*“The interest rates when we went over there were extortionate. I mean, you're talking 20-odd percent”*

*“And so all of the initial stuff was 100% equity funded. Yep. Bank debt funding was more, there was a reasonable amount existing over there for seasonal finance, but not really for term debt”*

#### Returns Expected

*“once the cows were milking, the milk price over there, the returns have been very good”*

*“13, maybe coming down to as low as 12, 12 to 15%.”*

*“the standard used to be 15% return on their investment”*

*“the capital gain would have been thought of to be on top, on top of all of those returns”*

*“In terms of what returns were the investors demanding on equity, yeah, we need to be higher than New Zealand, and we, because of, you know, country risk, we have delivered on value under-delivered on cash.”*

*“once we had the farm developed, the returns were between 25% and 35% of turnover”*

*“The margins have tightened up since COVID. Down to between 15% and 20%”*

*“Where farmers have got together, which is not a bad way to do things other than can limit scale and time a lot significantly, that they are more the two determining factors are they, they have a stronger understanding of the business, which is always we'll get to that really important thing, I think. And they were more likely to be more patient investors at a lower rate of return.”*

*“it was pension funds”*

*“Corporates are very attracted by the TMR cum system, because, again, it suits what they want to do, you suddenly have this feeling of control, you don't have a pasture-based dairying unless you're kidding yourself because every day is different”*

#### The Challenge of Achieving the Forecasts

*“the farms are averaging between 17 and 20 litres a day. Okay, okay. That's pretty good in a subtropical climate.”*

*“It was about, initially anyway, building a farm, proving it can be done and getting it up to profit. And the original forecasts that were done on that were, yeah, it was only half the amount of capital that we actually ended up having to put in, and it was going to be generating a post-tax return of around about 10% they had calculated. And that's actually still achievable.”*

*“we've had brucellosis, we've had foot and mouth, we've had the bloody works, you know. And, you know, foot and mouth scare the shit out of dairy farmers, but, you know, what I've learned, it's a shoulder strike”*

*“Now we lose five to ten cows a year with snakebite.”*

#### Macroeconomic Disruptions

*“But you have to offset that, the fact that when we first invested in 2007, the exchange rate is now half what it was”*

#### The Issue of Realistic Business Planning

*“They threw money at it, they thought they were going to scale very quickly, but they just didn't get the operations right, they didn't get the productivity and it just killed them”*

*“probably 700 to 1000 cow units, if I was going to build a serious thing”*

#### Exit Strategy

*“Yeah, so exit strategy, one of them on the table was a listing. So basically, listed on our stock exchange, probably not the New Zealand one, probably something else. I'm not saying it hasn't played out yet, but the theory was that you get a portfolio premium.”*

*“is actually well below their net asset price. So they tend to, what's sort of playing out is they tend to trade at a discount to actually release some value, which is not the way you want it, by the way. So there's a bit of challenge there”*

*“We have an office in town. The farms are fully self-managed. So we're looking at possibly selling 50 to 60% of it at some stage”*

*“the exit strategy for that capital was it was the sale of enterprises, individual groups, that was, that's how in the end, they sold the stuff”*

## 8.1.4 Land

### Investment Driven by Capital Gain

*“the land prices have been pretty stable for years and years, and they don't lend on buying land, so the banks will lend you money for cash flow for planting crops and for buying machinery, but they don't actually lend for the purchase of land. That will keep land prices a lot more affordable.”*

*“We bought our first block of land for 7,000. In local currency, 7,000 ha is a hectare, and now it's 35. So we've done well in capital gain also. Yeah, even though that wasn't our initial aim, was not the capital gain.”*

*“You could have bought 5,000 hectares for next to nothing. But we decided, no, that was a false economy. You're too far away from civilization.”*

*“we underestimated the milk price line over time series. And we were accurate or slightly underestimated the capital gain over the same period of time.”*

*“Capital gain was always factored into the returns. Purchasing land was always part of the investment strategy. So having said that, we lease, in addition to the land, we've got 22,000 hectares. So we do some leasehold, but most of it is – if we had access to more capital, we probably wouldn't lease anything, but we do lease some land”*

*“the only mistake was we didn't buy enough when the price of land was still cheap”*

### Leasing can be Cost Effective

*“You know, so what we've got is a 25-year lease on the block that we've got, and we lease a number of other bits around it as well”*

*“If you're an entirely leased business, you'd better hope the lease cost is well beneath the interest rate. Otherwise, you're 100% geared”*



## 8.1.5 Pasture

### New Zealand Unique Advantage

*“hybridized Kikuyu, and that's our dominant pasture because it's 25 degrees for most of the year, and so legumes are very hard to grow, like clovers don't really exist. That's our base pasture, but we're also – we do under sow in our cooler time of the year, which is happening now, we'll under sow what we call annual rye grasses into it”*

*“given pasture harvest is the dominant driver of profit in a dairy system, it's extraordinarily important”*

*“pasture percentage is the dominant factor determining your cost of production”*

*“Do you rely on irrigation for a significant period? We do because Brazil, we have two seasons, the wet and the dry. So, yeah, pretty typical continental wet, dry season climate”*

*“And it doesn't justify the capital costs of irrigation infrastructure when you need it for 60 days of the year rather than 180 days a year”*

### Affordable Supplement Feedstuffs

*“they seem to think that the grazed pasture is a big part of the diet, but I'd be lucky if it's between 5% and 10%. Right, right. It's pretty low. It's dominantly – I mean, yeah, feed pads is where most of the nutrient, you know, for the animal comes from”*

*“The cow diet, we have been on the cows wintered off, but principally on winter crops. Yep. We're moving to some more grass-based systems and we have been on around 700 to 800 kilos of grain a cow”*

## 8.1.6 Cows

### North American Genetics Predominate

*“Initially, we bought local – well, they're called Girolando and Zebu cross things, you know, the droopy-eared tropical cow that's been crossed with a Frisian and she had teats the size of posts.”*

*“So you've got these bigger, um, Holstein, Friesian cows over there, which are completely wrong, the wrong genetics for, for a tropical environment”*

*“if we take a Jersey cow and we take an HF cow and we measure it from the day that each one first dropped its first calf, in the next 1,000 days, that Jersey cow will have three calves in that 1,000 days. And the HF cow has two. Now, that's about heat tolerance and disease resistance. They won't be able to cope with the climate. They won't be able to cope with the high temperatures and humidity, yeah. They can't. And then you've got these fertility issues and everything else, health issues.”*

Changing to NZ Genetics Harms the Balance Sheet

*“my biggest error is not deciding to crossbred with a pasture genotype cow”*

The Correct Cow for the System is Key

*“Because if you pick that milkier cow out of a New Zealand catalogue, you're picking one with more US genetics on average, pick actually one on longevity or fertility.”*

*“using Kiwi semen, and so we rely on Kiwi, Frisian, and Jersey, and we basically have now what you'd class – well, we class as a Kiwi cross cow across Frisian, Jersey, and that's our dominant milking cow now”*

*“You still have to have that local animal resistance and all those tropical... Parasites, diseases”*

### 8.1.7 Governance

Local Management and Leadership from Investors are both Key

*“Well, actually, when we set it up, I was over there probably two times a year for about three weeks or a month at a time. Yep. And there was sort of three, four of us that were doing that in the first few years, you know, during the setup phase, you might call it.”*

*“you just have to be lucky enough to have good Brazilian people as part of the team. And if you haven't, don't go there.”*

## True Understanding of Dairy Farming is Required at the Director Level

*“people shouldn't be directors of companies, they should resign if they don't understand the company, how it works”*

## An Interruption at the CEO Level Causes Harm

*“had been in the business with Trainer Wheels on for two years. And so, with each change of CEO, we didn't have a player for one or two years. Maybe the business even sped up.”*

*“And we made a major error where, because we weren't there, we were under a little bit of pressure just around cash flow. And what did the ill-informed do? They go and look at some costs where we can save some fertiliser. Instead of saying we're going to take something out of R&E or vehicles or whatever, we cut fertiliser. So we broke, excuse my French, but we broke our own fucking rules, where our model, feeds the soil, so the soil feeds the cows, so the cows grow their milk. We didn't feed the grass for a couple of years.”*

## A Positive High Achieving Culture

*“didn't have somebody really strong in the finance and risk part of it. That was one reason. The second reason was they weren't farming well enough. They were good at acquiring and developing but tended to get bored with just farming well. The detail, the day-to-day detail. The third one was, there was some internal politics. And then the fourth one was just straight-out bad luck. And, you know, the timing of the GFC was a pretty serious influenza here in New Zealand, but it was a full-on pneumonia in the USA. And, you know, one of the two banks called their funds”*

*“There will be a whole lot of different things there around control, information sharing, liquidity, all those things will all be, you know, it'll be culturally different. So, you know, it'll be hard enough what you're doing without having sort of stakeholder control. And like this, we've been lucky because all of our shareholders have been sort of the same flavour”*

*“for the investors, it's probably a view on what's going to happen in the macro environment. Yes, certainly commercial property has done pretty well, but I know it's not doing so well now in the States, for example, with all the empty hot office buildings over there at the moment. But, I mean, really it's ultimately they're going to have to decide what, what they think is going to be a growth*

*area. I think, you know, high-value protein and there's no denying that, that dairy is, you know, is a great, uh, nutritious product and has so much, nutrient."*

## 8.1.8 Management and Personnel

### People Management is a Rare Skill

*"people one is the biggest challenge, I believe, actually, that that you come across is actually access to managers. And in some of these places, it's more extreme, and managers have not just a skill."*

*"having people to manage and pasture-based much, you know, that sort of management, similarly, be fair, similarly in a confinement... but that's the big challenge about getting performance"*

*"Good local people"*

*"the core tasks routine, and very routine, particular personalities, like doing the same thing. And you want them to do the same thing and try and do it better every day."*

*"I've never come across a country where I couldn't get cows milked. And if I couldn't get them milked, well, I knew it was my issue."*

### Leadership vs Management

*"absolutely key as you develop that equivalent, the best you can have a culture of ownership, ownership of results, which is talked about all the time, but very often is just genuinely just talking most of these businesses and there are some clear processes around it"*

*"I did have a deep understanding of how to employ people in major, major businesses. When we employ people, we better put some things in place. So you know, that you, you do the things that allow people to operate well"*

### Managers from New Zealand are the Solution?

*"The guy that's running the farms, we didn't think we could run the farms without a Kiwi. Yeah. Oh, actually, now we're running it without any Kiwis over there."*

*"I don't see a positive in having international people, other than if you haven't got the skills to call on, and you know, obviously, if there's a shortage, then so*

*what you're not after diversity, any diversity you're after is a diversity of thought."*

#### **Skin in the Game Can Help Alignment**

*"we had a system of if they achieved certain targets during the development phase and the farms were performing to the budgeted targets that we'd set, they got one or 2% shareholding in the property"*

*"Yeah, we modelled it out when we went down that road and we thought that it was to put contract milkers on versus a managed model at the time. This was probably about 10 years ago. We thought we'd given up about half a percent of our return by having contract milkers versus a manager. And we viewed that as a, as a, uh, a good trade-off given the reduced risk."*

*"the basis should be that, that you pay people, there's one you pay people for performance, so they get paid a sound, more than good sound wage, applicable to their position and their skills and experience. It's actually just saying that if they deliver more, they should get paid more."*

*"Management owns about 1% of the company. About 1% of the company is still seven or eight, you know, eight or nine million Kiwis, so, you know, six million U.S. So, they're relatively small slices. I don't think that's a hold enough that it really changes their behaviour. There'll be, you know, some of them are proud to be shareholders."*

*"We've got a management share scheme that young guys on the way up are pretty active investing in that. So, that works really well."*

#### **Motivating People is Key**

*"who's actually managing the thing, but you know, without good capability and motivated people, you can't farm anywhere. It's a people thing."*

*"There's a lot of management. You've got to be all over it. It can slip so easily, very quickly. And just knowing, how many cows you actually have and where they are"*

#### **Achievable Business Plans**

*"So the core is, is design your business with realistic outcomes, as we've talked about, and then fit the cow to it"*

*“whole idea of needing to design the production system for the country, for the region, for the climate, for the milk price, for the supplement price, for the potential pasture harvest that does to do with it”*

*“But we overestimated the speed that we could execute to the level that we wanted to. And I think that in terms of the original forecasts, rather ironic really, it's taken longer to get the farming precision.”*

*“It does take quite a while to get that pasture growing”*

#### The Right People

*“big point, in a sense, is all around how critical it is to have the people, including the skilled individual enterprise managers, focused on the right thing built into it”*

#### Be Humble

*“the western districts, which rain, which has grass for six months, and no grass for six months. And I know New Zealanders who moved there, who came and saw how wonderful it was in winter, with kind weather and didn't buy the farm and did not know the rain stopped”*

#### Thorough Due Diligence

*“which means they were much bigger shocked because they hadn't done their homework”*

*“which was very free draining, and then a light topsoil on top. Those farms, not to be brutal, but I don't know if they'll continue to be dairy farms.”*

*“we were visiting the big farm that we ended up buying, and it was the middle of June. And we stopped in a paddock about 400, 500 metres from one of their barns, their biggest cow barn, and saw the most beautiful grass that any farmer of any note in Ireland or New Zealand or anywhere would get their rocks off. It was just beautiful grass”*

*“Were there issues around adapting the Kiwi system and the grassland system? Yeah, it's harder. And so we are partially exiting. And look, hey, we've had better capital gain than we've had in New Zealand”*